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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, 1910

NORTHERN WISCONSIN COLONY
AND TRAINING SCHOOL
PROFESSIONAL LIBRARY

VOLUME 7

MADISON
DEMOCRAT PRINTING COMPANY, STATE PRINTER
1912

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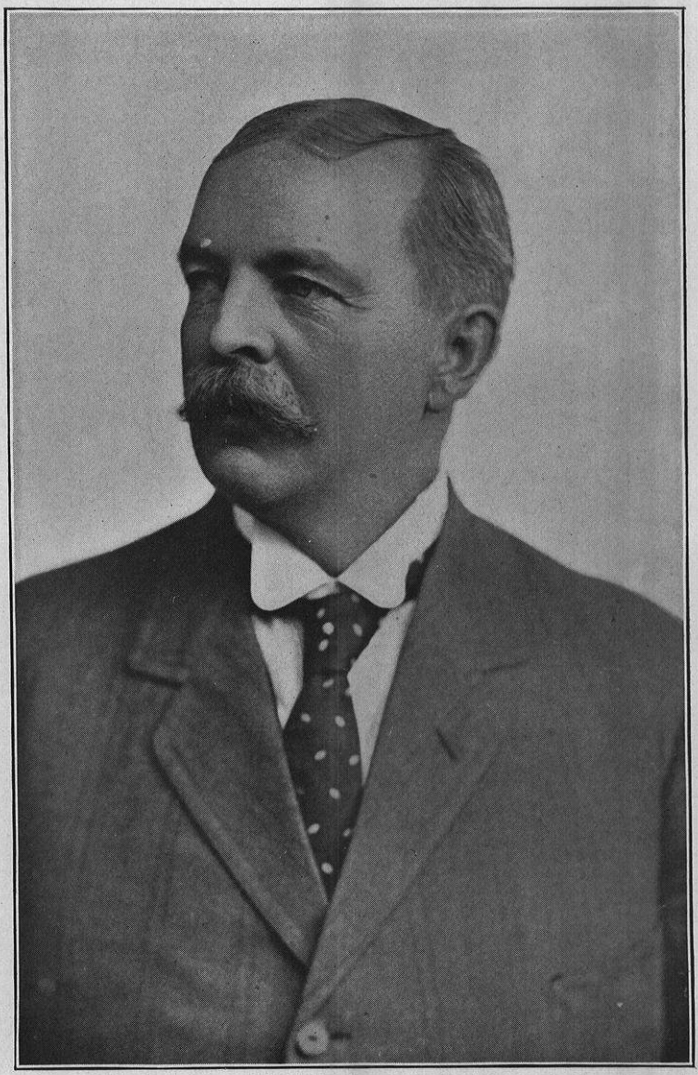

PRESIDENT JOHN KELLEY, JUNEAU.

PROCEEDINGS

OF THE

FIFTY-SEVENTH ANNUAL SESSION

OF THE

Wisconsin Teachers' Association

HELD AT

Milwaukee, November 4 to 6, 1909

Issued by the officers of the Association, and printed by the State Printing Commissioners by authority of section 335e, Wisconsin Statutes, as amended by chapter 339, Laws of 1901.

MADISON, WIS.
DEMOCRAT PRINTING COMPANY, STATE PRINTER.
1910

OFFICERS AND COMMITTEES.

President .....JOHN KELLEY, Juneau
County Superintendent of Schools

First Vice President .....GEORGE H. DREWERY, Madison
State Graded School Inspector

Second Vice President .....ALVA A. THOMSON, Richland Center
Principal County Training School

Third Vice President .....ELIZABETH McCORMICK, Madison
Primary Supervisor

Treasurer .....JOHN A. HAGEMANN, Fort Atkinson
Superintendent of Schools

Secretary .....KATHERINE R. WILLIAMS, Milwaukee
Assistant at Fifteenth District School No. 2

EXECUTIVE COMMITTEE

D. H. SCHULER .....Milwaukee

G. H. LANDGRAF .....Marinette

C. R. VAN HISE .....Madison

JOHN KELLEY, ex-officio .....Juneau

KATHERINE R. WILLIAMS, ex-officio .....Milwaukee

COMMITTEE ON LEGISLATION

C. E. PATZER ..... Milwaukee
P. J. ZIMMERS ..... Kenosha
JOHN CALLAHAN ..... Menasha
C. P. CARY, ex-officio ..... Madison
JOHN KELLEY, ex-officio ..... Juneau

COMMITTEE ON EDUCATION

J. B. BORDEN, Madison ..... for one year
ELLEN C. SABIN, Milwaukee ..... for one year
FLORA CLARK, Milwaukee ..... for one year
M. H. JACKSON, Grand Rapids ..... for two years
NORMA J. RELYEA, Black River Falls ..... for two years
W. J. HAMILTON, Two Rivers ..... for two years
JOHN A. H. KEITH, Oshkosh ..... for three years
E. C. ELLIOTT, Madison ..... for three years
T. R. LLOYD JONES, Fond du Lac ..... for three years

COMMITTEE ON ELECTIONS

Members for One Year

JOHN KELLEY, Chairman, ex-officio ..... Juneau
H. C. BUELL ..... Janesville
WALTER ALLEN ..... Milwaukee
ANNIE REYNOLDS ..... Reedsburg
O. H. BAUER ..... Juneau
CARRIE MORGAN ..... Appleton

Members for Two Years

R. C. RAMSEY ..... Peshtigo
W. C. HEWITT ..... Oshkosh
EMMA J. GARDNER ..... Milwaukee
K. L. HATCH ..... Madison
W. J. EBERWEIN ..... Cameron

LOCAL COMMITTEE

O. G. GILBERT, Chairman ..... Milwaukee

BUREAU OF INFORMATION

Wm. F. SELL, Chairman ..... Milwaukee

COMMITTEE ON REVISION OF CONSTITUTION AND BY-LAWS

G. C. SHUTTS ..... Whitewater
D. H. SCHULER ..... Milwaukee
F. S. HYER ..... Stevens Point
THOS. R. LLOYD JONES ..... Fond du Lac
E. C. ELLIOTT ..... Madison
JOHN CALLAHAN ..... Menasha

ARTICLES OF INCORPORATION OF THE W. T. A.

An Act to Incorporate the Wisconsin Teachers' Association.

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

Section 1. John G. McMynn, J. L. Pickard, E. Hodges, C. B. Goodrich, R. O. Kellogg, W. Vanness, D. Y. Kilgore, C. Childs and S. G. Stacy, with such other persons as may become associated with them and their successors, be and are hereby created a body corporate and politic, with perpetual succession, by the name of "The Wisconsin Teachers' Association" and by that name they and their successors shall ever be known, and shall have the power to sue and be sued, to contract and be contracted with, plead and be impleaded, defend and be defended in all courts of law and equity.

Section 2. Said corporation shall have a common seal, and shall have power to acquire, purchase, receive, possess, hold and enjoy property, real and personal, and to sell and convey, rent or otherwise lawfully dispose of the same at pleasure: Provided, That the amount of real and personal property of said corporation shall not exceed the sum of twenty thousand dollars at any one time.

Section 3. The purpose of said Association shall be the mutual improvement of its members, and the promotion of popular education thruout the state.

Section 4. Said Corporation shall have power to adopt such constitution and by-laws as they may deem proper, and make such rules and regulations from time to time as may be necessary to carry into effect the provisions of this act.

Section 5. This act shall take effect and be in force from and after its passage.

CONSTITUTION AND BY-LAWS, WISCONSIN TEACHERS' ASSOCIATION.

CONSTITUTION.

MEMBERSHIP.

Article 1. The Wisconsin Teachers' Association shall consist of school officers, teachers, and others interested in advancing the cause of education.

ANNUAL DUES.

Article 2. The annual fee shall be one dollar for men and fifty cents for women, payable at or before the annual meeting.

OFFICERS.

Article 3. The officers shall be a President, three Vice-Presidents, a Secretary, a Treasurer, and an Executive Committee of five, of which the President shall be a member, ex-officio. One member of the Executive Committee shall be elected each year for a term of four years; provided, that at the first election after the adoption of this constition two members shall be elected, one for a term of three years and one for a term of four years. The term of all officers shall begin three months after the adjournment of the annual meeting of the Association.

ELECTONS.

Article 4. The President and one member of the Executive Committee shall be elected annually by ballot by the members of the Association. The Secretary shall be elected by the Executive Committee for a term of three years. All other officers shall be elected annually by the Association on nomination made by the Committee on Elections.

EXECUTIVE COMMITTEE.

Article 5. The Executive Committee shall have general management of the Association, including the administration of the finances, the fixing of the time and place of the meetings, the oversight of the various officers in the discharge of their respective duties, and the

filling temporarily, of all vacancies not otherwise provided for. This committee shall have power to organize new sections, and to consolidate or dispense with existing sections of the Association.

PRESIDENT.

Article 6. The President shall be the executive head of the Association, and shall be responsible for the program of the annual meeting. He shall preside at the general sessions, and the officers of each section shall act under his direction.

VICE-PRESIDENT.

Article 7. In case of a vacancy in the presidency, or in the absence of the President from any of the meetings of the Association, the ranking Vice-President shall assume the duties of the President.

SECRETARY.

Article 8. The Secretary shall keep a record of the proceedings of the Association and of the Executive Committee, shall carry on such correspondence as may be deemed necessary, and shall perform such other duties as the Executive Committee may require.

TREASURER.

Article 9. The Treasurer, before entering upon his duties, shall furnish, subject to the approval of the Executive Committee, a surety bond, in a sum not less than two thousand dollars, the premium for which shall be paid by the Association. He shall receive all moneys due the Association and shall pay out such moneys only upon the warrant of the Executive Committee, signed by the President and the Secretary. He shall keep his records in such form as may be required by the Executive Committee and shall submit the same for inspection and approval at the last meeting of the committee during the fiscal year.

AMENDMENT.

Article 10. This constitution may be amended at any annual meeting of the Association by a majority vote, provided the proposed amendment shall have been submitted in writing at the preceding annual meeting. The proposed amendment together with the time and place of voting shall be published in the program.

REFERENDUM.

Article 11. If within ten days after the adoption of an amendment, a referendum is formally demanded by one hundred members, the Secretary shall at once send to every member a return postal

card calling for a vote on the amendment; and such amendment shall not become operative unless approved by a majority of the votes returned within thirty days. The names of the members voting for or against such amendment shall be published in the annual report.

BY-LAWS.

Article 1.—Business.

Section 1. There shall be a business meeting at the close of the general session every morning. All resolutions shall be referred to proper committees.

Section 2. Resolutions involving the expenditure of money shall be referred to the Executive Committee, and no appropriation shall be made for a longer term than one year.

Article 2.—Enrollment.

A Committee on Enrollment shall be appointed at every annual meeting. Of this Committee the Treasurer shall be chairman, ex-officio.

Article 3.—Elections.

Section 1. The Committee on Elections shall consist of ten members, five of whom shall be appointed every year, for a term of two years. Of this Committee, the President shall be chairman, ex-officio.

Section 2. The Committee shall meet on the day preceding the annual meeting, and shall appoint three inspectors for every polling place established by the Executive Committee.

Section 3. The location of the polling places and the time of their opening and closing, shall be announced in the program of the annual meeting.

Section 4. There shall be attached to every certificate of membership one nominating ballot and one election ballot, on each of which there shall be printed the date on which such ballot may be cast.

Section 5. Immediately after the closing of the polls on the first day, the inspectors shall count the votes, and shall certify the result to the Committee on Elections, which shall report to the Association at nine o'clock A. M. on the second day. Any person receiving a majority of all the votes cast for any office, shall be declared elected. If no person receive such majority, the two receiving the largest number of votes for the same office shall be declared nominated.

Section 6. If no election result on the first day, the names of the nominees shall be posted at the polling places on the second day, and the election shall be conducted at the same places, at the same time, and in the same manner as on the first day. The committee shall

report at nine o'clock A. M. on the third day. The nominee receiving the majority of the votes cast for any office shall be declared elected.

Section 7. When making its final report, the committee shall present nominations for other offices as provided in the Constitution.

Article 4.—Education.

Section 1. The Committee on Education shall be representative of the various educational interests of the state and shall consist of nine members, three of whom shall be appointed each year for a term of three years. Such appointments shall be made at the annual meeting and shall be subject to the approval of the Association.

Section 2. The Committee shall act as a Council of Education, to which shall be referred all resolutions involving educational questions. The Committee may recommend to the Association any other educational questions upon which action may be desirable, and shall conduct investigations ordered by the Association, or appoint others to conduct such investigations.

Section 3. The Committee shall hold daily sessions during the annual meeting of the Association. The time and place of such sessions shall be announced in the program, to enable members of the Association to present their views on resolutions which may have been referred to the Committee.

Section 4. The Committee may hold such other meetings and may adopt such standing rules as may be necessary for the efficient performance of its duties.

Article 5.—Legislation.

Section 1. The Committee on Legislation shall consist of five members. The State Superintendent of Public Instruction and the President of the Association shall be members, ex-officio, and one member shall be appointed each year for a term of three years.

Section 2. It shall be the duty of the Committee to represent the Association before the Legislature of the State, and at each annual meeting of the Association to submit a report of progress, together with a report concerning matters on which legislative action seems advisable.

Article 6.—Executive Committee.

Section 1. The Executive Committee shall adopt such standing rules as may be necessary to carry out its duties.

Section 2. The Committee shall meet on the day upon which the officers enter upon their duties. It shall have power to fix the compensation of officers not otherwise provided for, and to authorize the employment of such assistants as may be necessary.

Section 3. The Committee shall be responsible for the proper auditing of accounts, and at the close of each fiscal year shall prepare a detailed financial report signed by the members of the Committee.

Article 7.—Local Arrangements.

A local committee shall be appointed every year, and shall be given such power concerning local arrangements as the Executive Committee may prescribe.

Article 8.—Bureau of Information.

The Executive Committee shall make provision for official headquarters of the Secretary and the Treasurer, and shall provide for the organization of a Bureau of Information, the manager of which shall be appointed by the President.

Article 9.—Annual Report.

Section 1. The annual report shall contain the Articles of Incorporation, the Constitution and By-Laws, the proceedings, a classified list of members, the standing rules of the Executive Committee, their financial statement, and such other items as the Executive Committee shall prescribe.

Section 2. A copy of every paper read by a member before the Association or any section thereof, shall be secured by the Secretary before the close of each session. The Secretary of every section shall furnish the Secretary of the Association with a complete record of the proceedings of the section within ten days after the adjournment of the annual meeting.

Article 10.—Rules of Order.

Robert's Rules of Order shall be the authority on all matters of parliamentary practice except as herein provided.

Article 11.—Amendment.

These By-Laws may be amended at any regular session of the Association by a majority vote, provided the proposed amendment shall have been submitted in writing twenty-four hours before its adoption.

1. C. R. Van Hise, Ex. Com.
2. G. H. Landgraf, Ex. Com.
3. Elizabeth McCormick, 3d V. P.
4. J. A. Hagemann, Treas.
5. D. H. Schuler, Ex. Com.
6. A. A. Thomson, 2d V. Pres.

PROCEEDINGS

OF THE

Wisconsin Teachers' Association

57th Annual Meeting.

Milwaukee, November 4, 5, 6, 1909.

REPORT OF GENERAL SESSIONS.

Auditorium, Thursday Morning, November 4, 1909.

The fifty-seventh annual meeting of the Wisconsin Teachers' Association was called to order by President John Kelley.

The following committees were appointed by the President:

Committee on Elections for one year—John Kelley, Chairman, ex-officio; H. C. Buell, Janesville; Anna Reynolds, Reedsburg; Walter Allen, Milwaukee; O. H. Bauer, Juneau; Carrie Morgan, Appleton. For two years—R. C. Ramsey, Peshtigo; W. C. Hewitt, Oshkosh; K. L. Hatch, Madison; W. J. Eberwein, Cameron.

Committee on Enrollment—J. A. Hageman, Ft. Atkinson, Chairman, ex-officio; L. S. Keeley, Mayville; C. R. Rittenberg, Whitewater, F. W. Bucklin, West Bend; M. R. Bussewitz, Hancock; R. M. Dersc, Milwaukee; B. Mack Dresden, Oshkosh; G. H. Gohlke, Milwaukee; D. E. Frank, Milwaukee; R. B. Robinson, Beloit; M. Keats, Oconomowoc; A. B. West, Janesville; E. W. McCrary, New London; Philip A. Kolb, Wauwatosa; A. R. Clifton, Reedsburg; G. F. Loomis, Waukesha; W. T. Ream, Mondovi; R. H. Butler, La Crosse; D. O. Hibbard, Racine; A. J. Thorne, Jefferson; Edith McMillan, Milwaukee; Lotta L. Morgan, Oshkosh; Eva Kyle, North Fond du Lac; Eda M. Landgraf, Milwaukee; Frank Kroening, Milwaukee; B. E. McCormick, Watertown.

The following program was then presented:

Ave Maria (Gounod)—Mrs. Iva Bigelow-Weaver. Violin obligato by Calmon Luboviski, Paul Mueller at the piano.

Address*—"Gather up the Fragments that Nothing be Lost," Carroll G. Pearse, Superintendent of Schools, Milwaukee.

Address*—"The Educator's Responsibility for Our Vital Statistics," Dr. Helen C. Putnam, President of the American Academy of Medicine, Providence, R. I.

Toreador Song from Carmen (Bizet)—Sophus Marius De Vold, M. F. Diefenthaler at the piano.

Address—"The Playground Movement To-day," Henry S. Curtis, Ph. D., Vice-President of the Playground Association of America, Assistant at Clark University, Worcester, Mass.

Report of Committee on Legislation, C. E. Patzer, Milwaukee, Chairman.

Auditorium, Friday Morning, November 5, 1909.

The meeting was called to order by President Kelley, and the following program was presented:

Chorus—(a) "Anvil Chorus from 'Il Trovatore;'" (b) "Star Spangled Banner." Pupils of the Milwaukee Public Schools. Director, Mrs. Frances E. Clark, Supervisor of Music, Milwaukee.

Address—"Country Life and Country Schools," Fassett A. Cotton, President of State Normal School, La Crosse.

Address—"The Needs of the Country School," Chas. P. Cary, State Superintendent of Public Instruction, Madison.

Piano Solo (Selected)—Leland Hall, Department of Music, University of Wisconsin, Madison.

Address—"The Supervision of Wisconsin's Rural Schools," Leo P. Fox, County Superintendent of Schools, Chilton.

The hour being late, action on the report of the Committee on Revision of Constitution was deferred until the following morning as the first order of the morning's proceedings.

Auditorium, Friday Evening, November 5, 1909.

At eight o'clock on Friday evening Hon. Frank P. Sadler addressed the Association on the subject, "The Criminal in Making."

Davidson Theater, Saturday, Nov. 6, 1909.

The President called the meeting to order at 9 A. M. He announced the report of the Committee on Revision of Constitution, and Mr. George C. Shutts, Chairman, presented the report. Action was taken upon the report article by article. (The Constitution as adopted is printed on page —— of this volume.)

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* All addresses and reports read before the general sessions are found elsewhere in this volume.

WISCONSIN TEACHERS' ASSOCIATION:

Your Committee on Revision recommends the adoption of the following constitution; provided, however, that the changes proposed shall not affect the terms of officers elected prior to the adoption of this constitution.

Article I was adopted as read.

Article II was presented by a majority of the committee.

ANNUAL DUES.

Article 2. The annual fee shall be one dollar for men and fifty cents for women, payable at or before the annual meeting.

A minority report was submitted by E. C. Elliott and D. H. Schuler.

Minority report:

1. In Article 2, substitute the words, "active members," for the word, "men"; and the words, "associate members," for the word, "women."

2. Insert the word, "active," before the words, "members of the Association," in article 4; and before the word, "member," where it occurs in Article II.

Respectfully submitted,

D. H. Schuler,
E. C. Elliott.

Mr. Elliott argued that the fees as proposed created two classes of membership and were thus undemocratic; that the time had come to change the present system of running the Association and that the plan presented was the best possible to gain the desired result.

Mr. Schuler maintained that more revenue would result from the proposed change, and that women and men would alike be free to elect the class of membership which each desired to hold. He continued: "It has been suggested to me that this matter would receive a more unbiased and a clearer consideration if the question were divided, because there are really two distinct propositions; first there is the proposition of principle, and then there is that second proposition, that this is a matter of expediency. Therefore, Mr. President, I move you that we divide the amendment and consider first the provision requiring 'The annual fee shall be 50 cents for associate members, payable at or before the annual meeting,' and secondly, to consider the provision, 'The annual fee shall be $1.00 for active members, payable at or before the annual meeting.' The amendment offered by the minority report is that 'The annual fee shall be $1.00 for active members, and 50 cents for associate members, payable at or before the annual meeting,' and the amendment offered here is this, to divide this amendment and consider first the provision requiring that 'the annual fee shall be 50 cents for associate members,' and second that 'the annual fee shall be $1.00 for active members, pay-

able at or before the annual meeting.' These are the two propositions and we ask that they be considered separately."

Mr. Elliott seconded the motion.

President Kelley: "It is the opinion of the chair that the motion is not divisible, unless each part may stand alone if the other part is not accepted. The ruling of the chair is that this motion is not divisible."

Mr. Schuler continued: "I wish to rise then to a point of parliamentary inquiry. There is no where in the minority report the words 'strike out' or 'insert,' and if you will pardon me and allow me to continue from that point, I wish to say this for your consideration, that the minority report consists of a number of propositions which had to be stated in brief space in order to bring them to the notice of the association, and if these words are substituted as it was suggested on page 40 then that article would read as follows:

'The annual fee shall be $1.00 for active members and 50 cents for associate members, payable at or before the annual meeting,' and I would like to submit for your consideration, Mr. Chairman, that the order in which it was propsed to consider these two different propositions, that 'the annual fee for' 50 cents for associate members' could be adopted or rejected and there would still remain the question. 'The annual fee shall be $1.00 for active members,' and if that be adopted, it would entirely replace the old proposition as reported."

Mr. Salisbury raised the point that there was nothing there that was divisible.

President Kelley stated that the question raised by Mr. Schuler was out of order.

The question was then discussed by Mr. Ulrich. He moved: That the words "for men and 50 cents for women" be stricken from the majority report, so that it will read as follows: "The annual fee shall be $1.00 payable at or before the annual meeting," without stating whether it is for men or women. Article I states what kind of persons can become members of the Association; therefore, any one coming under Article I who pays their dues can become a member irrespective of their peculiarities.

President Kelley: I cannot see how the gentleman can introduce a third class.

Miss Sabin: If the motion of Mr. Ulrich is in order I second it.

President Kelley: It is not in order.

The amendment was further discussed by Messrs. Pearse, Callahan, Works, and Shutts.

The amendment was voted upon and President Kelley declared it lost. Mr. Schuler called for a division and the President's decision was sustained.

Miss Gardner then moved that the words in the majority report "$1.00 for men and 50 cents for women," be stricken out and 75 cents be inserted. "We have equality of vote and in every way that we want it. If this does not produce enough income to continue the Association, then we shall have to raise the fee, but I think the fee should be uniform. I move the adoption of the amendment."

A rising vote was called for and the amendment was lost; 168 voted for it, 276 against it.

Mr. Cheever moved: That the President take a test vote as to how many of those who voted against Miss Gardner's amendment were in favor of a $1.00 fee. The majority were opposed to the $1.00 fee.

The question then was upon Article II of the majority report. A vote was taken and the article adopted by a large majority.

Mr. Shutts moved the adoption of Article III.

The article was adopted by unanimous vote.

Mr. Salisbury then moved that the remaining articles be voted on all together.

President Kelley stated there was one more amendment which proposed that instead of the Executive Committee electing the secretary, the secretary shall be elected by the Association as a whole.

The motion of Mr. Salisbury seconded.

The question was put by President Kelley on motion of Mr. Salisbury that the remainder of the constitution be adopted as a whole, and the motion unanimously prevailed.

The constitution as a whole was then adopted by a unanimous vote.

Mr. Pearse then brought the following matters before the meeting:

First—

Resolved, That the Wisconsin Teachers' Association appropriate the customary sum of one hundred dollars ($100) for the purpose of paying the expenses of securing and maintaining Headquarters for the State at the next meeting of the National Educational Association.

The resolution was seconded, and unanimously adopted.

Second—

Whereas, The city of Milwaukee and the state of Wisconsin are inviting the National Educational Association to hold its coming meeting in Milwaukee, and

Whereas, It is customary for the cities and states inviting this Association to pledge a large number of members in case the meeting is held within the borders of the city and state extending the invitation, and

Whereas, The changed railway rates and conditions given to the Association in late years have militated seriously against the enrolling of so large a number of members as formerly; therefore, be it

Resolved, That the Wisconsin Teachers' Association, seconding the

invitation of the city of Milwaukee and the state of Wisconsin urge all school officials and teachers in this state to co-operate in every way to assist him in securing a large advance enrollment of members.

Resolved, That this Association urge school boards throughout the state to take active memberships in the Association both for the purpose of increasing the active membership list, and to secure for their school libraries the valuable volume of published proceedings of the Association.

Resolved, That this Association urge the school people throughout the state to co-operate with the State Director in securing as large a number active members as possible for the N. E. A. among the public libraries of the state, both for the purpose of increasing the active membership of the Association, and to secure for those libraries the annual volume of published proceedings, which contains every year many valuable educational documents.

The motion was seconded by Mr. Elliott.

After some discussion by Messrs. Pearse and Gillan the resolutions were adopted.

Mr. Pearse asked the members to push the sale of tuberculosis stamps during the Christmas holidays and his plea was met with great applause.

Mr. Buell read the following report of the Committee on Election:

For President—

Total votes cast 677; necessary to an election 339.

G. H. Landgraf received	403 votes
C. E. Patzer	249 votes
Scattering	25 votes
	—— votes
	677 votes

Mr. Landgraf was declared elected.

The following names were placed in nomination for officers for 1910:

First Vice President—Willis P. Colburn, Viroqua.

Second Vice President—R. H. Burns, Ladysmith.

Third Vice President—Helen Martin, Elkhorn.

Member of the Executive Committee for three years—Miss Nellie Minehan.

Member of the Executive Committee for one year—M. A. Bussewitz, to fill the unexpired term of G. H. Landgraf, who resigned.

Treasurer—J. A. Hagemann, Ft. Atkinson.

The report was unanimously adopted upon motion of Mr. Pearse.

President Kelley appointed Leo P. Fox, Chilton, member of the Legislative Committee for three years.

He appointed J. B. Borden, Miss Ellen C. Sabin and Miss Flora Clark members of the Council of Education for three years.

His appointments were endorsed by the Association.

The regular program followed the business meeting.

Violin Solo—(a) Nocturne, Op. 9, No. 2 (Chopin); (b) Scherzo Tarantelle (Wieniawski)—Calmon Luboviski.

Address—"Needed Educational Legislation," C. F. Viebahn, Member of the Wisconsin Assembly, Watertown.

Address—"The Proposed State Pension Law," Miss Elizabeth M. Herfurth, Chairman of Committee to Secure the Passage of a State Pension Law, Madison.

Piano Solo—Fantasie, Op. 76 (Chopin)—Miss Gretchen Gugler.

Address—"A Square Deal for the Publishers," S. Y. Gillan, Editor of Western Teacher, Milwaukee.

Business Meeting: Report of Committee on Education—J. B. Borden, Madison, Chairman.

The report of the Committee on Education was adopted in sections, as follows:

REPORT OF THE COMMITTEE ON EDUCATION.

The Committee on Education submits the following report and recommends:

1. First—That the resolution presented on November 14, 1908, by Professor C. R. Rounds, relative to the lack of uniformity in terminology in text books in English grammar, a copy of which is hereto attached, be referred to the English Council for study and report at the next meeting of the Association.

Report adopted.

Whereas, The various text books in English grammar now in use have no uniform system of nomenclature even for our most common English constructions; and

Whereas, Owing to this fact, whenever a pupil changes his text book he is obliged to spend much of his time in unlearning terms that he had just learned and in replacing those terms with new ones; therefore, be it

Resolved, 1. That this Association deplores the lack of uniformity in terminology in our text books in grammar.

2. That the President of this Association now appoint a committee of three to consider plans by which the influence of this Association may be brought to bear, in a practical way, upon the authors and publishers of such texts, to the end that ultimately a uniform system of terminology may be employed by our texts in grammar.

3. That this Committee report at the next annual meeting of this Association.

II. Second—That the resolution of the Physical Science Section presented November 14, 1908, relative to the teaching of physics, be approved and commended to the attention and serious consideration of the teachers of physics, to the inspectors of the high schools of the state and to those in charge of the entrance requirements of the higher educational institutions, and to the institutions for the training of teachers for the public schools of the state.

Report adopted.

Whereas, The present methods of teaching Physics in the secondary schools do not yield as satisfactory result as we desire to get, and

Whereas, We believe that this is due to the fact that far too great emphasis is now placed on accurate quantitative work, and

Whereas, This over-emphasis of the importance of quantitative work is due to the fact that some colleges take the position that physics is in its essence a quantitative science; that it is the only such science in the high school curriculum, and that it must for this reason be so taught irrespective of the needs and abilities of the students, and

Whereas, We believe that experience has conclusively shown that physics for high schools should consist of the study of the processes and principles of the phenomena of the daily life of the students, therefore

Resolved, That we, members of the physical science section of the W. T. A., in convention assembled, do hereby agree to change the methods of teaching secondary school physics by abandoning as far as may be found desirable the exact quantitative work, and substituting therefor a more living treatment of the subject based on the daily experience of the pupils."

III. Third.—That the resolution of the Science Section presented by Professor G. L. Collie, November 14, 1908, relative to year courses in science, be referred without comment to the State Superintendent of public instruction for such consideration as the merits of the situation may warrant.

Resolved, First, That the science section recommends to the Wisconsin Teachers' Association, that a determined effort should be made to induce the Free High Schools of the State to give year courses in science, even if fewer sciences be taught as a result.

Second, That the Science Section recommends to the W. T. A., that the Committee on Legislation be requested to secure if possible the abolition of the present requirement that physiology be offered as an elective in the high school course unless provision is made by law to have it preceded by a semester of zoology.

Report adopted.

IV. Fourth—That the Association commend the efforts of Miss Elizabeth M. Herfurth of Madison, to establish a retirement fund for the public school teachers of the state, and that the Committee on Legislation be directed to lend its support to such legislation at the next session of the state legislature.

Report adopted.

V. Fifth—That section I of the resolution of the Committee on Legislation, presented November 7, 1909, be adopted.

Section 1. "Resolved, That the Committee on Legislation be instructed to take necessary steps to secure legislation providing for the election of county superintendents by boards or education to be elected by the people of the various counties.

Report adopted.

VI. Sixth—That section 2 of the resolution of the Committee on Legislation, presented November 7, 1909, reading as follows:

"Resolved, That the Committee on Legislation be instructed to take necessary steps to secure legislation providing for the establishment of country high schools with courses of study looking toward training pupils for farm life," be amended to read as follows:

"R solved, That the Association recommend to the State Superintendent of public instruction the advisability of establishing in high schools, in country districts, courses of study that fit in and enrich country life."

Report adopted.

VII. Seventh—That section 3 of the resolution of the Committee on Legislation, presented November 7, 1909, reading as follows:

"Resolved, That the Committee on Legislation be instructed to take necessary steps to secure legislation providing for a change in the law governing consolidation of school districts so as to make the consolidation of small country school districts compulsory instead of optional as at present," be amended to read as follows:

"Resolved, That while it does not seem wise to favor a law compelling the consolidation of school districts, the Association commends the campaign in favor of consolidation that has been carried on in the state and urges upon all who desire to advance the cause of rural education the necessity of continuing the campaign for consolidation wherever conditions render the plan practicable."

Report adopted.

VIII. Eighth—That section 4 of the resolution of the Committee on Legislation, presented November 7, 1909, and reading as follows:

"Resolved, That the Committee on Legislation be instructed to take the necessary steps to secure legislation, providing for a legal min-

imum salary, similar to plans adopted in other states and corresponding to increased qualifications required by recent laws and demanded by public opinion," be amended to read as follows:

"Whereas, The Committee on Education, believing that a minimum salary law would operate advantageously in Wisconsin, undertook during the past three months an investigation of the conditions existing in Washington and Shawano counties, which briefly summarized reveals the following facts:

TEACHERS' SALARIES PER MONTH.

	Shawano County.			Washington County.		
	Male.	Female.	Total.	Male.	Female.	Total.
Country Districts:						
Number	20	103	123	27	72	99
Arithmetic average	52.6	37.654	.....	51.4	37.9	.....
Median	50	36	.....	30	35.50	.....
Mode	45	35	.....	50	35	.....
Villages:						
Number	11	47	58	.....	.....	.....
Arithmetic average	80.27	46.7	.....	.....	.....	.....
Median	75	45	.....	.....	.....	.....
Mode	60	45	.....	.....	.....	.....

Twenty-seven country districts out of a total 107, have an indebtedness of $19,266, which is less than the amount annually received by them from the county board levy ($19,951).

In the 107 districts, 112 teachers were employed and 74 of them changed teachers this year, and 50 of 74 are teachers with previous experience.

The average expended for each person of school age in 107 country districts was approximately $8.00, and in the villages and city the average was $9.50. The average in these 107 country districts for instructional purposes was $4⅓ per person, while in the villages and city the average was $5.50.

Average rate of annual levy of country districts is .0017 on $1000.

Average rate of annual levy for village districts is .0027.

Seventeen country districts raised no local tax whatever.

Ninety-four country districts raised $18,900.

One hundred and seven country districts received $19,951 from county board levy.

One hundred and seven country districts received $19,093 from state fund.

One hundred and seven country districts spent $70,250.

That is, the 107 country districts raised by local levy a little more than ¼ of the total amount spent by them. Taking out 7 districts, two of which were state graded schools that raised $3,800, the local tax on the valuation of $739,000 evidently for teachers' wages and building purposes, leaves 100 country districts raising $15,100 by local levy on an assessed valuation of $10,050,000 or a rate of 1½ mills on a dollar.

Had these 100 country districts assessed a tax of 2 7-10 mills as did the villages of Shawano county, they would have raised $27,160, or $12,060 more than was raised which could have been used for increased salaries. These 100 country districts paid $34,868 for teachers' salaries. If they had raised the additional $12,060 which they could have raised at the village rate—the average wages of teachers in these 100 districts could have been increased 34.6%.

Twenty-three of these 107 country districts have an assessed valuation of $50,000 or less; 30 have an assessed valuation between $100,000 and $150,000; 7 have an assessed valuation above $150,000; leaving 47 with an assessed valuation between $50,000 and $100,000.

No. 2, Town of Herman. A district with 31 children, assessed valuation of $30,000 raised $250 by local tax, or a rate of 8.3 mills on the dollar—practically five times as much as the average district raise, three times as much as the village average, and a million times as much was raised by the 13 districts that raised no tax on an assessed valuation of $1,700,000—paying the teacher $30 per month.

Joint No. 3, Maple Grove. One district of 90 children, assessed valuation of $77,000 raised $250 by local tax, or a rate of 3 2-10 mills on the dollar, practically twice as much as the average district raised, 5-10 of a mill more than the village rate—paying $40 per month.

No. 2, Town of Senaca. One hundred and twenty-four children, assessed valuation $125,000, no local tax levied, paying $43 per month. The average for 100 districts would have brought in $187.50; at the rate of the district cited above with $30,000 valuation, $1,937.50 would have been raised. This district could have paid $173 per month without any greater tax burden than that of the district which paid $30 per month.

No. 1, Town of Green Valley. One hundred and seventy-nine children, no tax levy, $60 per month to teacher, at 1½ mills on the dollar. This district would have raised $577 at 8 3-10 mills on the dollar, this district would have raised $3,195, which would have en-

abled them to pay $415.00 per month for nine months as easily as the small district with $30,000 valuation paid $30.00 per month to its teacher.

Whereas, While the Association approves the principle of a minimum salary law for public school teachers, which it is believed would serve greatly to improve the educational conditions in rural districts, it recognizes that before a reasonable and equitable minimum salary law can be put into operation, legislation equalizing the burden of school support between school districts will be necessary.

Be It Resolved, That the Committee on Education be directed to continue its investigation so as to provide the Committee on Legislation with such reliable information and data as will enable it to further the movement for intelligent and constructive legislation for a minimum salary law.

Adopted.

Ninth: That the Association expresses its appreciation to County Superintendent L. D. Roberts of Shawano county, and to County Superintendent Frank W. Bucklin of Washington county, for the assistance rendered to the Committee on Education by the complete and carefully compiled data concerning the schools of their counties.

Adopted.

J. B. BORDEN,
Chairman.

Miss Gardner moved: That Article 2 of the Constitution be amended by striking out the words "$1.00 for men and 50 cents for women," and substituting therefor "75 cents."

The amendment was received and laid over for one year.

At the close of the session the President thanked all who had taken part in the program, for their assistance, and those who had aided in the preparation of sectional programs as well as all who had coöperated in making the meeting a success.

Upon motion, duly seconded, the meeting was adjourned sine die.

KATHERINE R. WILLIAMS,
Secretary.

MINUTES OF SECTIONAL MEETINGS

COLLEGE, NORMAL AND HIGH SCHOOL SECTION.

General Session, November 4.

Chairman—M. S. Frawley, Principal High School, Eau Claire.
Secretary—Lura A. Burce, State Normal School, Stevens Point.
Treasurer—W. T. Ream, Principal High School, Mondovi.

The meeting was called to order at two o'clock by the chairman, M. S. Frawley.

Prof. F. C. Sharp of the University of Wisconsin talked on, "What Can the School Do in the Matter of Giving Training in Morals?" He stated that about one-half dozen high schools in the state are already giving moral instruction and that others will follow. People are beginning to realize that schools should train for life and not for livelihood. He believes that character is the most important thing in life and that the present out-put of our schools is poor in responsibility and reliability. The reason why morals have not been taught is because teachers have not known what to teach. Prof. Sharp advocates giving this instruction in a systematic way, and outlined to some extent the English method of instruction. He advises the development of moral aspirations by use of biography, bringing out strongly the characters which furnish inspiration to youth. A list of biographies for this purpose may be had on application to Prof. Sharp.

Instruction in right and wrong is also important. The pupil should recognize a lie or the nature of a lie and should be urged to do the right thing. The development of moral thoughtfulness is important also and the pupil should be taught to see his actions as they really are. To develop moral thoughtfulness, impress upon the child the importance of lost confidence and that lying is folly and cowardice; that lost confidence is lost capital. He would bring out the effects of character upon others and teach that the person who tells lies, increases the chances that others will lie to him.

Prof. Sharp would not put a text book in the hands of the pupils but would teach by question and discussion.

Rev. C. H. Beale, Pastor of the Grand Avenue Congregational Church, Milwaukee, talked along the same line. He said in part:

The subject of ethics, like all other matters that have to do with personality and the relations of individuals to each other and to society, has been the theme of much discourse and has been much befogged. What with discussions of freedom and necessity, of standards, ends and sanctions, the clash of idealist with utilitarian and hedonist, there has often been more heat than light, more smoke and dust than illumination.

Happily we do not need to go into any of these discussions but quietly and with a docile spirit seek to gain such practical suggestions as may enable us the better to establish right principles and habits in the hearts and lives of our young people.

In the first place there must be an earnest conviction on the part of parents, school directors and teachers that this is the most important of all kinds of training. This conviction should lie in the background of consciousness and have strong influence in the arrangement of the curriculum and methods of instruction and discipline.

As to methods, the best I can hope to do is to offer some suggestions, not with the expectation of saying anything new, but to set in order some of the things that you have thought upon as deeply as I.

1. There should be time and place in the curriculum for plain and friendly talks upon the simple duties and relationships of our common life. Such matters as cleanliness, the need of fresh air, nourishing food, pure water, plenty of sleep, exercise; the evil effects of alcohol, drugs and narcotics upon the growing body; the necessity for self-control—all these can be better presented in this way than by formal lessons. This may be followed by talks upon the economic virtues: honesty, frugality, industry, carefulness, system and punctuality. Goethe's three forms of reverence will furnish the basis for further conversations: reverence for those below us, kindness to animals and care for birds; for those about us, our friends and neighbors, finding expression in friendship, courtesy, chivalry and cooperation; for those above us in respect, reverence and obedience. These would naturally be followed by talks upon the home, social and civic duties, citizenship, philanthropy and patriotism.

2. There should also be carefully prepared textbooks in which the relationships, privileges, duties, obligations and responsibilities of intelligent and moral beings should be systematically set forth. Here should be place for papers, discussions and examinations as in other branches of study. Such a course should have a prominent place in the curriculum.

3. Since teaching by example is at once the most interesting and effective, text books might be prepared which set forth the qualities we wish to cultivate as exemplified in the lives of famous men and women and as represented in symbolic pictures. Such a book is prepared for Sunday Schools by the Unitarian Society under the title of Life Lessons, each chapter presenting some virtue which is illustrated by a famous picture and made attractive in the life and character of a great man or woman.

4. The literature of the world should be laid under contribution to furnish material which because of the clearness and strength of its thought and the beauty and charm of its diction should give noblest expression to high resolve and lofty purpose. The great poets, orators, statesmen and prophets have left on record utterances that seem to possess a life of their own which may be communicated to our lives until they throb with new vitality and every high purpose and lofty aspiration finds reinforcement. Tennyson—Browning.

6. But morality is a matter of training as well as instruction—of habit as well as precept. The school in its orderly operations, its discipline, its study-requirements is in itself a school of morals. In our days when moral discipline in the home is so lax there is no place where the child gets such training in all that goes to make an orderly, self-controlled, responsible life as in the public school.

2. The sense of honor which exists in all men in noble or degraded form can be made a powerful incentive to moral conduct. The sense of fairness can be appealed to with confidence when the facts are carefully and honestly marshaled.

But beyond these, the patriotic impulse should be utilized and given proper direction. Patriotism is the religion of the school room, and it is the second best religion in the world. Too often the patriotic impulse is exhausted in mere effervescence—in the telling of hero stories, the accounts of battle, and the singing of patriotic songs, most of them of a warlike character. We need to turn this into new channels by showing how the nation needs strong bodies, clear minds, honorable characters, self-sacrificing, incorruptible souls, unselfish and law-abiding citizens.

We need to show that the traitor of to-day is not the man who fires on the flag but the bad man who sets aside the law, corrupts the voter, seeks to control legislation for the promotion of personal interest or who refuses to perform the duties and take the obligations of citizenship, who wastes the people's resources or weakens by wrong-doing or neglect the foundations of our free institutions.

Teach the children that the enemies of the Republic are not red or gray coats but mosquitoes, flies, rats, tuberculosis germs, shirks,

cowards, grafters, unscrupulous men rich or poor, idlers, or non-combatants in the struggle.

SCIENCE CONFERENCE.

Thursday, 3 P. M.

Chairman—Dean Chas. W. Treat, Lawrence College.

The meeting was called to order by Chairman Chas. W. Treat. A paper on "Physics as it is and as it might be in Wisconsin Schools," was read by Dr. Chas. R. Mann of the University of Chicago. The following is an abstract of his paper:

PHYSICS TEACHING AS IT IS AND AS IT MIGHT BE IN WISCONSIN SCHOOLS.

The study of physics has been declining for a number of years, and if the present rate of decline continues, it will disappear from the high school curriculum in about 20 years. Yet physics teachers have been unwilling to make experiments in teaching in an endeavor to find out how to make their subject more effective; urging as a reason for this that they were so bound by college requirements that they did not dare make experiments. Teachers are just as much bound under the inspection and accrediting system of the west as under the examination system of the east.

In the matter of physics this excuse no longer holds, since the College Entrance Board has this year changed its requirement in physics. The number of topics suggested for the course has been reduced from 270 to 104, thereby leaving room for experimentation. The new ideals in education also demand experiments in effective teaching to find out how physics may be made to serve in developing social efficiency, morality, and the welfare of the community.

To be successful experiments in teaching must be directed toward settling some specific point. For physics the two most important questions are: Does the teaching leave clear, definite, usable ideas? and, Does it develop common sense? A number of quotations from examination papers showed that at present physics teaching does not do this in most cases. Observation of classes at work not only in Wisconsin but elsewhere showed that the following four reasons would best account for the failures:

1. The problems which the student is set to solving have not arisen from his own experiences and so beget no motive in him for their solution and have no significance to him.

2. Ready-made and abstract concepts are supposed to be grasped

when their definitions have been learned, whereas they must develop slowly from intuitive concepts that are at first hazy.

3. There are too many unimportant ideas introduced and these cause the student to lose sight of the important ones.

4. Many of the ideas presented in the present course in physics are beyond the powers of assimilation of the majority of the pupils.

In order to teach science in such a way as to avoid these four sources of failure, the pupils must study things, not books; they must have time to work with the things until the ideas of them become clear. They must not be plunged into a mass of unrelated detail but must be held to the main points which must be illustrated in manifold ways. As this sort of work takes time, the number of topics attempted should be relatively few. The syllabus of the North Central Association contains 48 topics, and this is about as many as can be studied thoroughly.

If the teacher makes it his teaching aim in physics to implant clear, definite, usable ideas about natural phenomena and to develop common sense, the demands of the colleges and those of the community are identical, and the vexing wrangle about college domination will not bother him. From now on physics teachers should continually experiment with their classes until each one has found for himself the best method of handling the subject.

Discussion was opened by H. L. Terry, State Inspector of High Schools, Madison, who was followed by Superintendent George A. Works, Menomonie.

The report of the Committee of the Wisconsin Teachers' Association on the Teaching of Physics was read by Prof. A. A. Upham, Whitewater, as follows:

The Committee for which I am to make this report was appointed by the Chairman of the Science Conference last year "To investigate plans for experiments in making courses in high school physics." This Committee, as its first work, brought in the following resolution, which was adopted by the Science Conference and referred to the general meeting, from which it was referred to the Committee on Education:

"Whereas, The present methods of teaching physics in the secondary schools do not yield as satisfactory results as we desire to get, and

Whereas, We believe that this is due to the fact that far too great emphasis is now placed on accurate quantitative work, and

Whereas, This over-emphasis of the importance of quantitative work is due to the fact that some colleges take the position that physics is in its essence a quantitative science; that it is the only such science in

the high school curriculum, and that it must for this reason be so taught irrespective of the needs and abilities of the students, and

Whereas, We believe that experience has conclusively shown that physics for high schools should consist of the study of the processes and principles of the phenomena of the daily life of the students, therefore,

Resolved, That we, members of the Physical Science Section of the W. T. A., in convention assembled, do hereby agree to change the methods of teaching secondary school physics by abandoning as far as may be found desirable the exact quantitative work, and substituting therefor a more living treatment of the subject based on the daily experiences of the pupils. (Signed) A. A. Upham,
Paul G. W. Keller,
H. L. Terry,
A. R. Clifton,
L. A. BuDahn.

It was understood, I think, that our Committee was to secure, if possible, some concessions from the College Entrance Examination Board, by which students who were not going to college could spend more time learning principles, and less in doing exact measurements. Since that time the College Entrance Examination Board has granted most of the concessions asked for, as the following will show.

"(1) The report [of the College Entrance Examination Board] has received the unanimous approval of the Committee.

(2) We recommend that the College Entrance Board no longer undertake the marking or examination of the laboratory notebook. (See form of Certificate recommended in lieu thereof.)

(3) We urge upon those who prepare the examination questions that these be so planned that students who have received fair preparation on the work as here outlined may reasonably be expected to pass.

Respectfully submitted,
N. Henry Black,
Chairman, Roxbury Latin School, Boston.
W. M. Butler,
Secretary, Yeatman High, St. Louis.
Winthrop E. Fiske,
Phillips Exeter Academy, Exeter, N. H.
Daniel E. Owen,
William Penn Charter School, Philadelphia, Pa.
Willis E. Tower,
Englewood High, Chicago.
Frank B. Spaulding,
Boys' High, Brooklyn, N. Y.

Physics.

General Statement.

1. The Unit in Physics consists of at least 120 hours of 60 minutes each. Time spent in the laboratory shall be counted at one-half its face value.

2. The Course of Instruction in Physics should include:

(a) The study of one standard text-book, for the purpose of obtaining a connected and comprehensive view of the subject. The student should be given opportunity and encouragement to consult other scientific literature.

(b) Instruction by lecture table demonstrations to be used mainly for illustration of the facts and phenomena of physics in their qualitative aspects and in their practical applications.

(c) Individual laboratory work consisting of experiments requiring at least the time of 30 double periods. The experiments performed by each student should number at least 30. Those named in the appended list are suggested as suitable. The work should be so distributed as to give a wide range of observation and practice.

The aim of laboratory work should be to supplement the pupil's fund of concrete knowledge and to cultivate his power of accurate observation and clearness of thought and expression. The exercises should be chosen with a view to furnishing forceful illustrations of fundamental principles and their practical applications. They should be such as yield results capable of ready interpretation, obviously in conformity with theory, and free from the disguise of unintelligible units.

Slovenly work should not be tolerated, but the effort for precision should not lead to the use of apparatus or processes so complicated as to obscure the principle involved.

(3) Throughout the whole course special attention should be paid to the common illustrations of physical laws and to their industrial applications.

(4) In the solution of numerical problems, the student should be encouraged to make use of the simple principles of algebra and geometry to reduce the difficulties of solution. Unnecessary mathematical difficulties should be avoided and care should be exercised to prevent the student's losing sight of the concrete facts, in the manipulation of symbols.

Certificate Required.

In lieu of the presentation of the laboratory note book, at the time of the examination, the candidate must present a certificate in the following form:

Teacher's Certificate.

..... High School,

..... 190—.

I certify that ..... has personally performed and properly recorded in a suitable note book ..... experiments in the physical laboratory of the ..... School, during the year .....

The entire course has occupied time equal to ..... hours of 60 minutes each, of which ..... hours have been given to the laboratory work and ..... hours to lecture and recitation work.

Signed .....

Teacher of .....

The teacher may here enter the final grade of .....%.

In order to ascertain if anything had been done to change matter and method of teaching, I sent out the following circular letter to one hundred of the larger high schools in the state. Answers were received from about one third of those addressed.

Whitewater, Wis., Sept. 22, 1909.

Dear Sir: You may remember that the Science Section of the Wisconsin Teachers' Association, last November, passed the following resolution: "That we hereby agree to change the methods of teaching Secondary School Physics by abandoning as far as possible or desirable, the exact quantitative work and substituting therefor a more living treatment based on the daily experience of the pupil."

1. Have you done anything about this in your work?
2. Do you believe in it?
3. Have you any suggestions to make?

Won't you kindly answer this right away because the time is very short and you know you may forget it if you put it off?

Sincerely yours,

A. A. Upham,
Chairman of Committee.

Some of those who replied did not answer the questions, but of those who did, nineteen answered the first question, "Have you done anything about this in your work?", in the affirmative, and four answered in the negative. To the second question, "Do you believe in it?", twenty-two answered "yes," and five said "no." To the question, "Have you any suggestions to make?", there were a good number of answers and I have a considerable body of report of what the

teachers are doing, from which I will quote as much as my time will allow. I will quote first from three normal school teachers of physics. "I try to make my physics class interesting to my students by handling the subjects in a common sense way, but I do not strain myself to make everything practical, as the term is used in modern education; I believe that physics should be taught for its disciplinary value as well as for the common phenomena which it is intended to explain. I have not changed my course, but I do make at least one third of the laboratory course qualitative. I fear that some may interpret your resolution to mean that *all* quantitative work should be eliminated. Such a condition would, in my opinion, be more deplorable than the present condition." The second says: "It seems to me like adopting a resolution that men should not eat so much meat. Such a resolution would doubtless be good advice to some men and very poor for others. I have not seemed to find that high school men were running to such excess in the use of quantitative experiments as was represented at that meeting. What does the resolution mean? 'As much as possible' would mean cut it all out. 'As much as desirable' means leave it where it is now, since each man is now doing what seems to him desirable. We shall never get down to a reasonable basis for the guidance of teachers in this line till we make our directions and instructions more definite and specific, as the Eastern Association has done, and state definitely just what experiments we recommend, and within reasonable limits just what is to be done with each experiment. Most of our high school teachers are men of very limited experience and backed by university ideals of what to do in the laboratory. They do not know what quantitative work is for, and so can not make such work count. But it should be remembered that they are still less qualified to make a more directly practical laboratory course that will count. There is even more danger that the more purely qualitative work will become a mere fireworks, stimulating nothing but a directionless curiosity. About half my experiments are what might be claimed as quantitative, but the large side of all of them is qualitative. Not more than three or four are purely quantitative." The third man says: "I have cut out from the beginning physics all work with the micrometer and vernier gauges. I have also cut out all work on falling bodies, as such, and treat the subject as illustrating the fundamental relation between force and motion. I believe in the resolution most heartily. I know from personal observation that the exact quantitative work of University physics means very little to many students in the University. I am confident that it means less to the high school students. In our Summer School I had an earnest body of high school graduates taking

physics. Their whole conception of physics was to make certain numbers fit into some formula to get some kind of answer."

Here are some of the answers from high school teachers, either directly quoted or the substance of their answers given: "No, I do not believe in the resolution in its extreme interpretation. I believe that a student of high school age should have to do things with exactness." Another says: "We have divided our physics class into a boys' division and a girls' division. The boys take some exact quantitative work, but the girls practically none. We differentiate in the matter given to the boys and to the girls. We are living up to the above mentioned resolution."

"I believe in abandoning in a large measure the exact quantitative work in high school physics. I have in the past, and am this year, planning to relate the text with the everyday life of the pupil. My effort is to give a simple concrete illustration of the hows and whys of the physical world in which the pupil lives."

"I heartily approve of the movement. Our work is secondary schools is hampered to a certain extent, by higher institutions of learning demanding and requiring us to teach what is of little practical value to the ordinary student."

"I have at no time given much attention to quantitative work in physics, and am most heartily in accord with the insurrection. The more pupils can be made to handle familiar objects and find in them new attributes the better."

"It is my policy to keep out the exact quantitative work to a much greater extent than is ordinarily outlined in most of the laboratory manuals. I think my course this year will involve about fifteen to twenty experiments that might be called quantitative. Besides this, I am outlining many experiments that I call supplementary laboratory work, which involve the principles that are usually treated in the subject in a way that they may see their customary application as it usually occurs in their daily experience."

"I am heartily in sympathy with any change that can be made to make the physics work more attractive. Last year, I made considerable change in the subject of heat, taking up fully the different methods of heating buildings, and believe that the pupils got something more valuable than they could have gotten from the study of the book. I can not see why the whole subject can not be developed along that line."

"The only suggestion I have to make is that teachers try to be conservatively progressive in this matter and not go to the other extreme. I do not think any just syllabus can be prescribed for all schools."

"I think a judicious mixture of the two kinds of experiments will keep the balance between the 'why' and the 'how much.' As far as possible, I shall have qualitative experiments to illustrate principles and quantitative to fix laws."

"The great tendency today in our science work is to deal with something too advanced for the pupils' comprehension. When a boy goes out from our high school he ought to know the philosophy of the ordinary pump, and the girl ought to know why the potatoes boil more readily in one kind of kettle than in another, etc. The world asks practical questions."

"I believe that physics, coming as it does at the end of most secondary school courses, should be the culmination of the pupils' scientific work and that from it he should get the idea that all physical phenomena are underlaid and controlled by definite and exact laws. I do not believe in abandoning as far as possible the quantitative work."

"My stand is this: there is a value in accuracy both from the standpoint of discipline and from that of clear thinking; therefore, quantitative work should not be omitted. The useless refinements, corrections, and adjustments should be omitted, for these omissions will not obscure the vision but rather clear it. Boys and girls like to 'see things go.' Let them 'see things go,' but when they attempt to measure the gait, let it be done in a reasonably exact manner. The use of the micrometer caliber, the beam balance reading to centigrams, etc., is not beyond the capabilities of the high school pupil, and it would be a mistake to banish these things from the laboratory."

"I am much pleased to hear of the resolution. For years I have battled with the state and university inspectors over the folly of doing hair-splitting quantitative work. However, before I can answer intelligently, I must know just how far you intend to swing the pendulum the other way. I believe the course in physics should be as thorough in the laboratory as in the classroom. I believe in the pupil doing the work carefully and correctly, and to get the result the first time."

"In general, I believe in it. At this school, however, we have forty weeks of instruction with nine hours a week given to physics. I actually would not be able to keep these people at work if the painstaking time-taking quantitative work were removed. Also in a great number of cases the whole essence of the work goes with the quantitative reading."

"Have cut out of the laboratory work most experiments requiring close accurate figuring and work. Those we have left we work on a broad scale. Have put in more qualitative experiments, those that illustrate principles."

"I have always found, during my short experience, that whenever an experiment called for mechanical following of directions and had no practical application, the result was always careless and reluctant work on the part of the pupil."

"I favor the resolution. While the course in laboratory work here is not extremely quantitative in nature, I changed it somewhat. In electricity, I have the students connect up an electric bell, a telegraph system, connect cells in parallel and in series, test voltage, etc."

"We have reduced the laboratory periods from four to three each week and increased the number of recitations from three to four. Much more time is devoted to demonstration before the class."

"I am thoroughly in sympathy with the movement to give high school physics a living treatment in class room and laboratory. However, I do not believe the information side of the subject should overshadow the training in accuracy and scientific method. The other day some house-movers were moving a house along the road in front of the school building, and I had the class see the application of several principles of physics, viz., the resolution of forces, the lever, the advantage of the pulley, and that reduction of friction by use of roller bearings. The city is putting in a new bridge across the river here, and I shall take the class down and show them the pile drivers at work, showing the difference between kinetic and potential energy, also what is meant by tension, falling bodies and several other applications of physics. I have arranged to take the class to the city pumping station when we take up hydraulics, the city power station, and telephone and telegraph offices when we take up electricity, also one of the doctors here has an X-ray machine which I shall endeavor to have the class see in operation. When we study heat we shall visit the round house near the school building, also examine the engine in basement of school building. Have also been thinking of having a photographer come up and explain the taking and development of photos. This last under subject of light. I also have designs upon the weather bureau station here."

"I am very much interested in the circular letter of inquiry recently received from you. The resolution passed by the Science Section of the Wisconsin Teachers' Association has commonly been hailed as a sort of new awakening in the teaching of Physics. In a measure this is certainly true. I am most heartily in favor of connecting the subject of Physics with the experiences of daily life. I am also in favor of abandoning some of the "exact quantitative work," taking this to mean exercises which approach precision work or such in which time seems to be spent rather for a given quantity than for a relation, a principle, or a law. There is, however, a considerable amount of quantitative work in Physics which itself must receive "a more

living treatment' rather than be 'abandoned' or be displaced by any substitution. Physics divides itself into descriptions and definitions on the one side and principles and laws on the other. The latter grow out of quantitative relations and there is no other way of establishing them than by reasonably exact work. On the other hand, not all of physics can be based on the 'daily experience of the pupil;' in such cases the experience must necessarily be furnished in the laboratory. The following steps are helping me in solving this problem:

1. Segregation of boys and girls in class and laboratory work. This can not be done in many schools so that I may feel fortunate in this respect. The field covered for both classes is practically the same, but the emphasis on the various subjects varies: the field of 'daily experience' drawn upon in the two classes varies decidedly; the boys whose ambition it is to do some quantitative work can do so.

2. No laboratory manual is rigidly followed in the laboratory. Several sets of the best manuals are kept on the reference shelf from which a series of experiments are chosen by the teacher. Some experiments are taken from the text book; these are usually qualitative, or descriptive.

3. A short account of the life of great scientists, such as Galileo or Faraday, is accepted as equivalent to an experimental exercise; likewise a descriptive account such as the story of the hydraulic press, of the thermometer, of the telescope, or of the wireless telegraph, is given credit. In both cases, however, the emphasis must be laid upon that which relates to physics.

4. The making of most of the apparatus for a number of experiments is carried out so far as time permits. This seems to make 'experience' where there is none.

5. The graphic method is used as much as possible both in oral and written work. Charts of the most important and helpful diagrams are made by the students most interested and then the class recites from them. Wherever the diagrammed object can be secured it is used with the diagram. This is another way of furnishing needed experience.

6. A reasonable effort is made to have text books in the hands of the student that agree with the spirit of this resolution. Failing in this they are secured on the reference shelf. Sometimes it is almost impossible to get such a change."

"I now exact little or no quantitative work of the *exact* type from my pupils. Take such a problem as finding density of a substance, while the idea of quantity enters, it is not what I think would come under the head which the resolution condemns. I believe thoroughly in the spirit of the resolution. The only suggestion I make is that I

believe it would be wise to select a certain number of qualitative experiments which some authority would require every high school senior to perform—say, a minimum of 30. Then have a second list of valuable experiments as supplementary. In order for any experiment to be on either of these lists, it should be passed upon by some authority and a reason should be given why it should be there. There is too much of the 'high sounding' and 'shallow draught' in physics. I believe I could suggest a set of experiments that would make a fairly good start in this line and append some few of them.

1. Find density of iron, brass, lead, cork, kerosene. Reason: That pupil may understand the relative weights of different materials.

2. To verify the law of liquid pressure by means of flasks with movable bottoms of same area but holding different volumes of water. Reason: To teach the principle of pressure intensity.

3. To balance the atmosphere against a column of mercury. Reason: To teach the action of the barometer.

4. To place confined gas (air) under 1–2–3–4 atmospheres pressure and compare in each case. Reason: To show that gas can be compressed, and that a definite mathematical relation exists between pressure and volume.

5. To weigh 1 cu. ft. of air. Reason: To teach that air is *substance* and not space.

When I collected all the experiments which I found in this way I would sort them into a required and supplementary list as above suggested. I will not burden you with further matter further than to say that in Physics, as in all other High School studies practically, we lack the voice of authority. We need to have some one give us the word of his authority that certain things should be done, and being done the study will be acceptable for a credit by any and every institution."

In conclusion, I wish to express my thanks to those teachers who answered my circular letter and gave reports and offered suggestions. I trust they will excuse me for not answering all their letters, as I should have been glad to do. It is hoped that this report may shed a little light along the misty road of uncertainty.

A. A. UPHAM,
For the Committee.

Superintendent W. H. Schulz of Eau Claire discussed the report of the Committee.

COLLEGE, NORMAL, HIGH SCHOOL SECTION.

General Meeting, Friday 2 P. M.

Chairman—E. C. Elliott, University of Wisconsin.
Secretary—Lura A. Burce, State Normal School, Stevens Point.
Treasurer—W. T. Ream, Principal of High School, Mondovi.

The meeting was opened by Chairman E. C. Elliott. The first topic, "The Library Question," was discussed by Mrs. Theodore Kronshage, ex-Librarian, Milwaukee. She said in part:

"Every year upwards of sixty thousand dollars are expended in purchasing library books for schools.

It is one of the teacher's chief duties to train his pupils to use books intelligently. The intelligent use of books I understand to include not only the ability to read from them comprehendingly but the ability to get from them, in the shortest possible time, just that information which is sought. In the well-ordered library, one of the greatest aids to this latter use of books is the dictionary catalog. On this catalog depends greatly the efficiency of any library, large or small.

I am fully aware that a catalog is only one means to a great end, and that in forming right reading habits among children more depends upon the teacher than upon the catalog. But as Mr. Rice is to deal with this phase of the subject later on, I shall confine myself to a consideration of the catalog.

I firmly believe in the necessity for a first class dictionary catalog in every country school.

1. It is a time saver for the good teachers, many of whom, in spite of all instruction as to the preparation of catalogs, are still laboriously looking up references in their library books and writing these references upon the board for the day's work. If placed on cards instead and entered in the catalog, this work would be of value not only to the class for whom it is prepared but for many coming classes.

2. It may even, to a certain extent, take the *place* of the less willing teachers who seldom refer to books outside of the text. When a pupil has once learned to use a dictionary catalog, he is likely to go to the library independently. He may use it to help him in his studies, or in his own boyish way to find out more than he knows about the thing which interests him,—whether it be Tecumseh or the gentle art of catching musk-rats. His using the books at all is a point gained.

3. It is a help and time-saver to both teacher and superintendent when new books are to be purchased. It reveals at once the weak

and the strong and the overloaded places in the make up of the library.

4. It is a time-saver for the pupil, deciding for him at once the question of available material on any subject.

5. It is an educational tool which every child has the right to expect he will be taught to use. The library is a recognized institution in our state and everyone should be prepared to get from it, if possible, that which he wants to know.

Since the publication of the 1906–1907 township list with indicated dictionary catalog, a great deal of cataloging has been done and many school libraries are in good condition. However, much *remains* to be done. Five or six thousand minds do not act as one, even when following identical directions. To secure greater perfection and greater uniformity in cataloging should now be our aim. The new law providing for the examination in library methods of certain grades of teachers will produce better conditions in school libraries. I hope in time all grades may be required to know something of library work. But even with this training of teachers which cannot be thorough at the best, uniform and perfect catalogs will never be secured in the country schools until the material for the cards is prepared by one person or group of persons acting under one head, and the cards themselves are printed at some central office and then distributed to the schools.

It was my desire to see this done when I was in State Superintendent Cary's office, and at my suggestion a bill was introduced into the legislature and passed, which authorized the State Department of Education to print dictionary catalog cards for all books appearing on the township library list, and to furnish such cards to the districts. For various reasons, the exercise of the authority granted by the legislature did not then seem feasible, but I believe that the time is now ripe to put into operation some plan for the printing of cards. The list is now so large that it would seem an excessive demand on the state to supply both cards and printing free of charge to all schools. Therefore, I suggest the following compromise:

1. Let the state printer set up in type a set of catalog cards for each book on the township list, from the cards already on file in the State Department of Public Instruction.

2. After proof on these cards has been carefully read and corrections noted by the printer, let a stereotype plate be made of each set of cards.

3. Let the cost of composition and stereotyping be borne by the state, the plates thus becoming the property of the state. This would, I believe, entail a cost of about four or five thousand dollars.

4. Let the library book contractor, at the beginning of each season during which books are sold to the schools, advise the state department or the state printer of the approximate number of each title which he expects to sell during the season, and let sufficient cards be thereupon printed from the plates to meet this demand.

5. Let cards be furnished the contractor on his order, to be delivered by him to districts with the books.

6. Let the price to districts given in the township list be the bid price of the contractor, plus the cost price of the printed cards. Provision should be made by which a district may be able to purchase several copies of one book without duplicating the cards.

7. Let the contractor collect from the districts both the price of the books and the price of the cards and remit to the state department or the state printer the cost price of all cards delivered to him.

8. Provision should also be made for the purchase by the districts of cards for books already on the library shelves.

Under this plan the state will be put to no expense other than the initial cost of composition and stereotyping, and, what is most important of all, the districts will be furnished with printed catalog cards all ready for alphabetical distribution in the catalog cases at a cost not exceeding the cost of unprinted cards to them today."

Miss Delia Ovitz, Librarian of the State Normal School, Milwaukee, talked on "Library Instruction in the Normal School." In her descriptive outline of the work she said:

"We give two courses in library instruction, the elementary and the advanced, the latter optional. We aim to cover the following ground in the elementary course:

1. Classification and arrangement of the library, with location of the different classes, magazines, current and bound, pamphlets and pictures.
2. Use of the card catalog.
3. Use of Poole's index and special indices.
4. Use of reference books.
5. Sources and use of pictures.
6. Sources and use of pamphlets.

Experience has taught us that it is useless to lecture to students and not follow the lecture up with practical application of the subject so an important phase of the work has been to require the student to spend an entire day in the library during his first term at school. Personal instruction is then given him in the classification and arrangement of the books, pamphlets, magazines and pictures. He has explained to him the catalogs and various indices and is given some work in the mechanical preparation of the book for

the shelf. I know from experience that this day spent in the actual work in the library is much more helpful than many lectures on the same subject. It takes a great deal of the librarian's time each day to give this personal instruction but it more than pays in the end.

We instruct the students how to compile bibliographies, and show them the bibliographies on the different subjects compiled by other people. The teachers help us here by assigning topics to be worked up. This comes in connection with the work in economics, geography, history, pedagogy, literature and lines of work taken up in connection with the literary and debating societies, and practice work.

In as much as we are preparing teachers to go out and educate children, we realize that an important phase of our work is to see that the students get acquainted with the best literature for children. This we work out in our library reading courses in the grades and our juvenile literature course in the normal school. To me the juvenile course seems far more important than the courses in advanced literature. We are training students to teach children and this being so the students must know the best children's books and how to bring them to the children. It is good for a teacher of small children to know Browning but it is better for her to know and love the best in children's literature. She ought also to know what ways of presenting this literature are most likely to be effective. If right reading habits are to be formed among the school children it becomes the duty of the teacher to guide them in their choice of reading matter. Probably one of the most effective ways of advertising any book is to tell a story from it, and so in most libraries the story hour is an established thing. Children should be allowed free access to the shelves of a library. There is nothing like familiarity with books to create a love for them. We should never try to force a child to read a book. I always recall a chapter in my own child life when at an early age I was made to read Ivanhoe and when a couple of years later we took it up in school I never could get up any enthusiasm for it. It behooves us, however, as teachers and librarians, to try to get the right book to the right child at the right time and the aid they give in this work is the chief value of our courses in Juvenile Literature and Library Reading.

In connection with the work in Juvenile Literature, we aim to acquaint the student with the best helps in the selection of books for the school library.

1. The high school and township lists gotten out by the state department.
2. A. L. A. list.
3. Miss Hewin's list.
4. Miss Salisbury's list and others.

In addition to the Library Reading and Juvenile Literature, splendid work is being done in the reading and language course. In this course students must familiarize themselves with the best short stories, poems, fables and legends. The card catalog will not help them here as it would be impossible for us to index every individual poem, short story, myth, fable, fairy story or legend, so students must do original research work here. They become familiar with Granger's Index to poetry, Bryant's How to tell stories to children, Miss Salisbury's Index to short stories, McMurry's Special method in reading, Field's Finger-posts to children's reading and many other books with collections of stories and poems. This research work is invaluable. When a new subject is to be taken up some teachers post the list of required references with exact page of each reference and argue that it conserves with the student's time and energy for the work in hand—this is well and good and we all approve of it up to a certain extent; but we must not forget that we may do this too often and so make the student incapable of helping himself. There is nothing like turning students loose occasionally to dig out things for themselves.

We put much stress on the value and use of reference books. It is really surprising how few of these general reference books we need to get any and all information, and how often students—yes and teachers—consult them only after spending much time in searching in every other place imaginable. I wish that all students before coming to us might know,

1. Webster's International dictionary.
2. New International Encyclopaedia.
3. Lippincott's Gazetteer.
4. Statesman's yearbook.
5. Classical dictionary.
6. Who's who.
7. Who's who in America.
8. Dictionary of quotations.
9. A good atlas.
10. A good encyclopaedia of literary criticism.

In our advanced course, which is elective, we give ten lessons in technical training including work in ordering books, classifying, accessioning, and cataloging. In the early years of my work in library instruction, I was prone to put over emphasis on the technical side of library training, and this course also was required of all students. They spent hours in making out sample accession sheets, author, title and subject cards for books, and I in turn spent hours in revising them. I still do this for a few students who hope to do high school work, but feel very strongly that the emphasis should be put rather on knowing and using books. If the teacher finds it necessary to catalog

the school library she can, with a good working knowledge of the normal school library, together with the most excellent and helpful rules and suggestions for cataloging a school library gotten out by the state department, do so. Besides, I hope the day is not far distant when all schools can afford to follow the example set by Milwaukee and many other cities, and employ a teacher-librarian who can organize the school library, instruct the children not only in the high school but in the grades as to the use of same, aid the teachers in preparing reading lists, collect pictures and pamphlets, in fact handle the library in the most effective way for all concerned. Librarians, at least, know that it is asking too much of the teacher to require this work of her with her already crowded program and with her lack of library training. I most heartily approve of library instruction in the Normal schools in so far as it seeks to acquaint students with books and their uses; but I don't believe we have a place for a detailed course in library science. It is the function of the library training school to train librarians. We can, however, well afford to spend more time than we do in what I have outlined as our elementary course, for this makes possible good work in every other line.

A summary of the paper given by O. S. Rice, State Library Clerk, on "General Reading by High School Students," follows:

GENERAL READING BY HIGH SCHOOL STUDENTS.

O. S. Rice, State Library Clerk.

Probably the most significant movement in education at the present time is the movement which has for its purpose to make the education which the schools give of the greatest possible use in life. Is the reading done by high school students of such a character that it will be of direct and unquestionable value throughout life?

In the literary reading classes the reading in many if not most schools is almost entirely intensive. Certain pages are assigned in a literary classic; these are read orally and "picked to the bone" in the class. Before the book has thus been read through most of the students are heartily weary of the "grind" to which they have been subjected. Portions of a classic ought, of course, to be read intensively and read orally in class, but a large proportion of the book ought to be read outside the class and discussed only in a general way in the class. This will make it possible to complete the book within a reasonable time and to incite rather than kill interest in reading. There should be much reporting on books read outside of the class, but as a rule this reporting should be made individually to the teacher. The rest of the class may in the meantime be reading books on which they

are to report. When the teacher finds that a certain report will interest the class, she may arrange to have the class hear it. A series of perfunctory and monotonous book reports made to a class is a sure way to kill interest in books. Certain books should be read outside of the class by the entire class, and then there should be a general discussion of the book read much after the manner of a book or study club. The object at all times should be to awaken and stimulate a life-long interest in reading that is worth while.

In such a subject as history we may well ask what kind of reading will be of the greatest value to the student throughout life. Text-books he will scarcely want to look at after leaving school. If, however, he is made acquainted with general historical literature, such as good history novels and historical articles in the magazines, he will be started in a line of reading which will tend to make him an increasingly intelligent and useful citizen. Ought not such reading in connection with the history class to be given equal importance with the body of facts which it is thought essential to teach?

In civics, a certain body of facts must, of course, be taught. But what kind of reading, connected with their duties as citizens may we reasonably expect the people to do? We surely do not expect them to read text-books on civics. Ought they not to read largely and with discrimination in newspapers and magazines concerning the current problems of government and the things which are being done in the way of solving these problems? Would not the reading of books depicting conditions which affect the great mass of the people be of the utmost value? Among such books may be mentioned "The Making Of An American," by Riis, "Up From Slavery," by Booker T. Washington, "The Woman Who Toils," by Van Vorst. The conditions depicted by such books are the conditions with which the citizenship must cope through its government deal. Ought not, then, such general reading to be made an integral part of the instruction in civics?

In scientific subjects the student should be introduced to such general literature as depicts the practical application of modern science to the alleviation of suffering, to the prevention of disease, and to the general welfare of society. In connection with instruction in bacteria, for instance, there should be much general reading dealing with the prevention of contagious diseases, especially of tuberculosis. Much of this kind of literature must be sought in current magazines.

One high school principal in the state has proposed having a half-year course in current topics. If the right kind of books, periodicals and public documents were at hand, and the course were well planned it would be a valuable part of a high school course; for the students would do the kind of reading in school which they ought to do throughout life.

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This subject of general reading in the schools is of such importance that institutions training teachers ought to make special provision to prepare teachers to carry on general reading at least as well as the text-book work. The normal schools have made at least a beginning in this direction. Ought not the State University, which prepares most of the teachers in the high schools, give this subject attention to the extent of having, under the direction of the department of pedagogy, classes in library or general reading? Specialists in the various University branches are usually not the proper persons to give instruction regarding general reading suitable for high school students. Such classes should spend much time in getting acquainted with the books and periodicals which should be made use of in high schools for general reading and in learning how best to make use of them. In addition instruction should be given in the mechanics of library work, including some instruction in the cataloging of the books.

If we are to make the study of high school branches of real value to the student and society the general reading in high schools must be given a good share of that attention which has heretofore been given almost exclusively to textbook work.

LATIN TEACHERS' CONFERENCE.

The second annual meeting of the Wisconsin Latin Teachers' Association was held in Committee-room "A," second floor, Auditorium, Friday afternoon, November 5, 1909, with Professor Ellsworth David Wright, Appleton, acting as chairman. To save time, the attention of those present was directed to the account of last year's meeting, which appears on page 28 of the "General Proceedings," President Wright appointed, as a committee, to nominate officers for the next year, Professor George C. Fiske, Miss McGregor and Mr. Roland Zinns.

The program of the afternoon followed:

1. "The Progress of the Association," Wallace Reiss, Milwaukee.
2. "Our Greater Organization," Miss Charlotte Wood, Whitewater.
3. "Report of the Committee on a Traveling Collection of Lantern Slides," Professor George Converse Fiske, Madison.

This committee, consisting of Miss Leta Wilson, Darlington; Miss Helen Fitz Gerald, Superior; Wallace Reiss, Milwaukee; Mr. John P. Deane, Beloit; Mr. A. W. Tressler and Mr. G. C. Fiske, Madison, divided the state into five districts, with a member of the committee in charge of each district. The total amount of money gathered from the different schools and at present in the chairman's hands is $72.90, which represents subscriptions from some 25 schools; the remaining 200 schools in which Latin is taught did not reply to two appeals sent to them. It was considered advisable to purchase an alcohol lantern,

and as many slides as possible, to supplement the 100 slides donated by the University Extension department. The work will be continued for another year during which the committee hopes to obtain in the neighborhood of $300. In conclusion, the following resolution was offered—(this was afterwards passed in the regular business meeting that followed the program).

In conclusion, your committee has the following resolutions to offer in regard to certain practical details:

(1) Both the slides contributed by the Extension Department, our own lantern, and our supplementary collections to be, shall start from Madison as a distributing center for the whole state.

(2) The University Extension Department shall take charge of the distribution and shall have, upon request, equal right to draw from our collection of slides just as we draw from theirs. In other words, we are entering into a partnership in which each party to the contract retains full ownership, but in which to the mutual advantage of both the property is managed under joint control.

(3) The slides and lanterns upon application to the University Extension Department, may be borrowed by any high school of the State for lecture purposes, upon the payment of express charges plus a reasonable sum to insure against breakage.

(4) The traveling lantern collection shall not be retained in any high school longer than three days from the time of its arrival. The object of this resolution is to insure as nearly as possible the continued circulation of the collection and equal advantage to all schools of the state.

(5) A committee upon the traveling lantern slide collection shall be appointed by this Association in such manner as it shall deem most fit. This committee shall have power to prepare such further regulations for the management of the collection as are necessary, subject to the approval of the President and Executive Committee of the Association.

Respectfully submitted by the Committee upon the Traveling Lantern Slide Collection.

4. "How to make Caesar interesting," Miss Sarah Bemis, Milton.

5. "The Teacher's Equipment for Second Year Latin," W. D. Shannahan, Madison.

In the absence of Mr. Shannahan, Principal John P. Deane, Beloit, read this paper.

6. "Mythology in Connection with the Teaching of Virgil," Miss Helen Fitz Gerald, Superior.

7. General Discussion: a. "Practical Methods in Latin Composition," (led by Miss Henrietta Fuller, Appleton); b. "Devices for Ac-

quiring a Working Vocabulary, (led by Miss Catherine Holah, Baraboo).

At the conclusion of this program, the Committee on Nominations, whose report was accepted unanimously, read their selection of officers for next year: President, Mr. John P. Deane, Beloit; vice president, Miss Helen Fitz Gerald, Superior; secretary-treasurer, Wallace Reiss, Milwaukee. Members of the Executive Committee: Mr. George F. Loomis, Waukesha, Miss Anna B. Moseley, Madison.

A motion was offered by Mr. Roland Zinns, and passed by the Association, providing that the same committee that had charge of the lantern slide fund last year, shall continue its work for another term. The suggestion was offered by Miss Charlotte Wood that some effort be made to have the Latin and German conferences on different afternoons because so many teachers were interested in both meetings.

There being no further business, the meeting adjourned.

WALLACE REISS,
Secretary.

Abstract of paper read before the classical section of the W. T. A. by Charlotte Robertson Wood of the Whitewater Normal School. Wisconsin Vice-Presid nt of the Classical Association of the Middle W st and South.

That this is an age of organization is too apparent and too well known to require demonstration. In the political world, the very words "boss" and "ring" give us a vivid idea, if not of honest politics, at least of successful political operations—successful solely because of perfect organization. In the business world, companies, trusts, corporations, represent the same principle, that more can be accomplished by united concentrated effort than by the scattered efforts of many.

That we believe the same thing is true in educational work is proven by our presence here in such large numbers. Not without purpose do so many teachers every year spend time and money for the meeting of the State Association. Nor is there any idea that the chief value of such meetings lies in the papers and discussions that can be heard. The greatest benefit is the impetus gained by means of the personal contact of so many people of like aim and spirit.

Classical teachers decided some years ago that they could accomplish more if they were associated in some way. So an organization, calling itself the Classical Association of the Middle West and South, was formed. It is made up of classical teachers in twenty-eight states. Its aim was and is mutual benefit. A general meeting is held once a

year, at which questions of interest are discussed; the latest discoveries in the classical world are made known; and improved methods of instruction are suggested. The total enrollment last year was 1674. Wisconsin was fourth, with a membership of 124. For this year the total is now 1714 and we are trying very hard to make it 2000. That is my chief purpose in appearing before you.

Tho teachers have many uses for their money and must make wise choices in regard to its expenditure, they can never afford to be without some magazine that relates to their work. The membership fee of two dollars buys two magazines, a quarterly and a monthly. Doctors, lawyers, statesmen, all must keep up in their lines of work by reading the up-to-date literature of their profession. Classical teachers cannot afford to allow people to say that their subjects are dead and that the teachers are dead too. If we have no use for the twentieth century, it will have no place for us. We must keep abreast of the times.

But if any do not want the magazines, let them join for the sake of the increased effectiveness of the Association, gained thru increased numbers, and for the sake of giving their moral support to an organization which is striving to promote the very interests which they themselves are striving to promote. Never will college entrance requirements be right; never will the general public understand the practicability of the classics, never will many other reforms in our work be accomplished, till the classical teachers as a whole realize their duty and their opportunity and support their own organization, The Classical Association.

THE PROGRESS OF THE ASSOCIATION.

Wallace Reiss.

Mr. Chairman, and Members of the Latin Teachers' Association:

You all know that the primary object of the Wisconsin Latin Teachers' Association is "the promotion of the study of Latin, and the improvement of its teaching in the University, Colleges, Normal Schools, and Secondary Schools of Wisconsin." Surely, no one doubts that the first of these objects depends wholly and entirely upon the second, for with teachers well equipped and enthusiastic, Latin becomes, not a dead language spoken by dead people, and repulsive to all that have any serious intentions of remaining among the living, but a real, live subject that appeals to all, both for its practical and cultural values. With this point of view in mind, and the realization that the possibilities of Latin, when well presented, are boundless, it has been the earnest endeavor of all officers and committees of this Association, to

make the annual meeting serve as a most potent factor, both in adding facts and methods to the equipment of Latin teachers, and in creating an inspiration for the work by personal contact with the active energy of others.

The programs, which were planned to give the actual experience of teachers in meeting difficulties, in making work in Latin more interesting by unique, original, and practical methods, and in attracting the attention of those not engaged in this study, by showing all its advantages, have served to give every member present some new idea. As a result of these little "shop-talks," we all, no doubt, have gone home better, more cheerful teachers, determined to try just a little harder to maintain the interest of all our pupils, to arouse a feeling for the classics among others, to carry on an aggressive campaign in behalf of a branch which cultured men of all ages have recognized as the basis of all knowledge that is worth while.

To further both of the fundamental objects of the Association, a committee has been at work throughout the year to provide for a collection of lantern slides, to be used by all Latin teachers in Wisconsin. As soon as this undertaking is perfected—its achievement is in the present—additional material, dealing with Roman life and customs, will be placed in the teachers' hands. Thus in this way again, the boys and girls in the different schools will be led to realize that once upon a time, there existed real, live Romans, who acted and talked just like ordinary human beings.

As an organization, we have but a brief past to look back upon, the history of which you know; but we look toward and live for the future. To insure the progress and attain the ideals of our Association, we must assume certain responsibilities, and perform certain duties as individual members. With us, membership is entirely voluntary; the nature of our work makes us members. We may come or go, take part or refuse, help or hinder, knock or boost, as we please. And because of this absolute freedom, our very presence shows that we are bound by the stronger ties of personal interest and enthusiasm, feelings which can in no way be made more clearly manifest than by hearty, cheerful loyalty to the Association.

By loyalty, I mean not mere passive interest in what is said and done, not excessive activity in avoiding all duties and responsibility, but aggressive, earnest endeavor, an unselfish interest in all the work, and a desire to be satisfied with no attainment short of the best. Then we shall be teachers worthy of the subject we present.

This spirit, once developed and fostered, insures coöperation in the preparation of the annual program, noticeable assistance in practical undertakings, such, for instance, as the lantern slide fund and moral support wherever any member happens to be. It means, too, that

some of our pent up enthusiasm will be carried home with us, so that our pupils, also, will feel its enlivening effects. In this way, the influence of the Association, and the efforts it expends, will bear fruit throughout the year, in better teaching, and consequently, in placing Latin upon a firmer basis.

With this feeling of determination to make Latin what it ought to be, with this effort to forget ourselves and work for the common good, with this feeling that we are all engaged in a noble, just cause, and above all, with that loyal enthusiasm and confidence engendered by our annual meetings, we shall act as a united body to reach the goal set before us—more and better Latin.

SUMMARY OF PAPER ON "HOW TO MAKE CAESAR INTERESTING."

Sarah Bemis.

Interest may be added to the study of Caesar's "Gallic Wars" by the following measures:

I. By Maintaining a Definiteness in the Work.

A. By Definiteness in Assignments and Emphasis.

1. Assignments must be absolutely definite, so precise that the student may have a very clear idea of the questions, which may be asked.

2. A clear and constant emphasis must be maintained. Teachers must decide what phase of the work should receive the most emphasis and then not only give it first in their minds, but tell the students to place their chief emphasis upon it.

B. By Definiteness in Methods of Acquiring Vocabulary and Translation:

1. Vocabulary may be learned with interest by means of spell downs, by emphasizing the cognate idea to bring out the dependence of the English language upon the Latin; by calling for English loan words derived from the vocabulary learned.

2. Translations may be made more interesting by carefulness and thoroughness on part of teacher and student; by introducing sight reading to show the students their own ability to translate; by having certain sentences of the day's translation occasionally written upon the blackboard by members of the class to be criticized by the students as regards correct English and adherence to the thought of the Latin translated; by having a rapid reading of the review lesson and at times of several lessons already covered in order to connect the narrative and thereby prevent narrowness of thought grasp; by calling attention to the passages in Caesar which are rich in literary qualities.

II. By Thoroughly Humanizing the Work and Making it More Concrete:

A. The historical setting of Caesar may be made clear and distinct by either reading aloud to the class carefully selected portions of some good Roman history dealing with the times, or by having the students themselves read such selections; by means of collateral reading; by having the students picture for themselves those by-gone days.

B. The geographical setting of the wars may be made definite by map talks, and the constant use of maps in the daily recitations; by having the pupils draw from memory a map of Gaul and locate the important mountains, rivers and nations mentioned in the work; by the use of relief maps of western Europe; by a careful study of the maps found in the text; by reading articles on Caesar's battlefields as they appear today; by gaining a knowledge of Gaul in the time of Caesar.

C. A knowledge of Caesar's army may be gained by reading encyclopedic accounts of the legion, the camp, etc., and such books as "Caesar's Army," by Judson; by introducing discussions on such subjects as the legend, the army officers, the baggage, the Roman camp, etc., by showing illustrations of siege works, soldiers, weapons, etc.

D. Caesar may become known to the students by presenting him in his various aspects—as a man of the world, a statesman, a general, a lover of literature;—by disclosing his aims, his ideas of imperialism; his power, his ambition; by having debates and discussions in regard to him.

E. The political and religious organizations of Rome in the times of Caesar may be worked out by carefully prepared special topics; by appointing members of the class to represent the various officers, such as consul, praetor, augur, etc., and having such members discuss the offices they hold.

F. Keen interest may be aroused by occasionally having lessons devoted entirely to outside works, papers, special topics, etc., or by assigning shorter lessons on certain days and devoting the remainder of the time to spell-downs, sight reading, discussions, map talks, and other points of interest; by organizing a Latin Club which has its officers and holds meetings every two, three, or four weeks, and the programs which consist of numbers dealing with Latin subjects, such as dialogues in Latin, debates, occasional stereoptican lectures, Latin hymns, etc.

MYTHOLOGY IN CONNECTION WITH THE TEACHING OF VIRGIL.

Helen Fitz-Gerald.

After the strenuous work of the first three years of High School Latin, emphasis should be given to the literary side. To do this, it is necessary to have the readers of Virgil understand the mythological references. How much can we do, in one year toward making a student familiar with the ancient gods and heroes? Results are unsatisfactory unless the subject is presented in a systematic form, so that it offers a foundation for the many details that must be remembered. At the beginning of the work, a general survey of the whole subject, including the Origin of Myths and the World of Mythology, should be followed by genealogical tables tracing the relation of gods and mortals. Some definite idea of the most important of these characters should be formed, as all later references will, in some way, be connected with them. Note books, containing a simple outline of these essential points, should be kept and referred to constantly. As the translation proceeds, oral reports should be given on all new references and an effort made to relate these new ideas to what has already been learned.

If a plan of this kind were carefully followed throughout the year, there is no doubt that the time spent on reports and notes would be more than regained for the student would have, not only a definite idea of Mythology, and a thorough understanding of Virgil's Æneid, but he would also have a proper appreciation of this great masterpiece of classical literature.

MATHEMATICS CONFERENCE.

Friday, 3 P. M.

Chairman—M. A. Bussewitz, State Normal School, Milwaukee.

The meeting was called to order by Chairman M. A. Bussewitz.

Recent Progress in the Teaching of Secondary Mathematics and Improvements Yet to be Made," was the first paper, read by Dr. L. W. Dowling, University of Wisconsin, Madison. A summary of the paper follows:

RECENT CHANGES AND FUTURE PROGRESS IN THE TEACHING OF MATHEMATICS IN THE SECONDARY SCHOOLS.

Dr. L. W. Dowling, U. W., Madison.

Among the recent changes in the teaching of mathematics in the secondary schools, I mention, first of all, the better training of teachers. I regard this as a recent change, for it is not so long ago that

it was thought any person could teach mathematics who knew ever so little, or nothing, of the subject beyond that which he was expected to teach. At present, superintendents and principals of high schools are loath to employ teachers who have no knowledge beyond algebra and geometry. I mention this point first because it seems to me of first importance that a teacher should know more of his subject than he is expected to teach, whether this subject be mathematics or any other.

Recently, in the university, there has come a better professional training. Having furnished the candidate with a fair knowledge of the subject he wishes to teach—and it is not necessary that he should have explored the entire field—he is given a training in how to use this knowledge to the best advantage in imparting it to others. He is taught how to interpret the various class-room phenomena, how to encourage certain of these, how to counteract certain others. To be sure, much of this training must be acquired in the actual class-room, rather by instinct than education. I am a firm believer that the true teacher is born, not made. But at the same time, there is a growing body of professional knowledge of this kind which is of great use to the young teacher and will often save him from having to profit by his own mistakes.

In this professional training is included a knowledge of current text books. The candidate learns to compare these and to speak intelligently of their merits, or demerits, as the case may be.

In this professional training is included also a certain amount of actual observation in the class room.

That this professional training is of the highest importance no one can doubt who has seen it in operation. The problem has been, and perhaps still is, to know just where to draw the line between the amount of instruction in the subject to be taught and training in the methods of teaching it. At the University we feel we have an approximate solution at least and I am sure the results have been gratifying to all who have observed them. That the candidate should pursue a course in theory of equations beyond the quadratics he will have to teach; that he should know something of analytic geometry and calculus, the two subjects which, together, touch closest the *application* of mathematics to natural phenomena, seems not at all unreasonable. If, in addition, he has the professional training already mentioned, we may assume that he is prepared to teach mathematics in the secondary school. Were he a born teacher he might get on without this professional training, but it is safe to say, he will do better with it. He who is not born a teacher, but aims to become one, will scarcely succeed without some such training as outlined. The conception of what constitutes the training of a teacher of mathematics in the sec-

ondary schools and the administration of that training form what seems to me the most important of recent changes. It is perhaps incomplete but one can only imagine that minor changes will occur, perfecting the general scheme.

We live in the age of text books—their name is legion. One can mark recent progress by following the annual output of secondary school text books. Not long since texts upon algebra were filled with graphs and graphic methods. Some of them were almost analytic geometries in embryo. More recently the pendulum has swung the other way toward a saner treatment of graphs, relegating it to a narrower compass and not to the exclusion of more important principles. Cutting out difficult and tedious exercises is a point gained in recent texts. Some books went to seed on the practical side, introducing many physical problems before the student was ready for them. Text books with special fads soon drop by the wayside.

The suggestive type of text book is unquestionably better pedagogically than the stereotyped variety.

It is better to lead the student through a series of theorems, compelling him to think out the demonstrations for himself rather than inviting him to memorize fixed proofs, however beautiful and proper the style.

In the immediate future I look for progress in this direction. Less stereotyped demonstrations and processes and more suggestive methods leading the student to build his own demonstrations as far as possible. I believe, by Auguste Compte—that the best method for the individual to obtain a mastery over any domain of human knowledge is the method pursued by the race itself. I believe this principle is valid in general. It undoubtedly has its limitations in applicability, and it is the business of the educator to know these limitations. Certainly no truth came into the possession of the race in a stereotyped form. The presentation of truth, cooked, dried, and fossilized is more or less deadening. Pupils fed on over-doses of this sort of pabulum and on time-allowance for digestion soon lose the divine curiosity of early childhood and grow blasé. Their chief aim in studenthood becomes to get through the daily task with the minimum of effort. They cram, and finally are graduated somehow into actual life with poor ability to think clearly and concisely and badly equipped to cope with the problems which present themselves.

It is the chief aim of mathematics in the high school to train and to strengthen the power to think clearly. It is peculiarly adapted to this end, since its fundamental concepts are few and simple, and its conclusions absolutely definite.

Algebra is a symbolic language, marvelously beautiful in detail, in completeness, and in perspicuity. It is an instrument of great power,

but symbolic in character, and symbolism is necessarily abstract. Put the average high school freshman into algebra and he is like a bull in a china shop. He can neither appreciate its beauty nor its wonderful workmanship. Should he succeed in getting out without wrecking the shop or killing himself, he is likely ever after to be shy of china. It is positively painful to witness a class of these youngsters laboriously working through long problems in highest common factor or lowest common multiple when they and everyone else know the results obtained are of little value either commercially, physically, or mentally. It is no wonder that mortality is great in high school algebra. It is Spartan practice to thrust a youngster into a sea of cold lifeless symbols and tell him to swim or sink. Granted that it is necessary for him to learn to paddle around a bit, let us mercifully give him a sliver or two of training in mathematical thinking or less abstract nature before consigning him to deep water without anything to cling to.

Perhaps these metaphors are somewhat in too high relief to bring out the case in its true perspective. But I am anxious to emphasize the abstract nature of algebra as compared with the more concrete geometry and the absurdity of trying to teach the one before the other.

The history of mathematics proves that geometry was developed long before algebra. To be sure some slight knowledge of the solution of easy equations of the first degree occurs very early in this history, but the algebraic solution of quadratics was not affected until 700 years after elementary geometry, both plane and solid, was definitely completed by Euclid. This early symbolic method, or algebra, of Diophantus remained a closed book to mathematics for hundreds of years after it was written. In a word, modern algebra in all its beauty of detail and wonderful power is scarcely 300 years old. To be sure it did not spring, like Minerva, full armed from the head of Jove, but its earliest developments are antedated by the complete development of geometry. Algebra is, in fact, a mere babe as compared with geometry, a hoary patriarch of over twenty centuries. And yet we attempt to present this new modern instrument of research to the high school freshman before introducing him to the older and simpler mode of mathematical thought! Surely this is putting the cart before the horse.

Geometry is concrete in character. Its symbolism is elementary and less remote from the objects symbolized. Its fundamental concepts and principles are familiar from every day life. Its methods of reasoning are quite as direct and often simpler than those obtaining in algebra. In fact, there is every reason for teaching geometry first and algebra second, if indeed they must be taught separately. And there is no good

reason for not doing this, so far as I know. This change in the curriculum should not be looked forward to in the dim and distant future but ought to be contemplated at once. Nothing but custom and inertia stand in the way. It cannot be called conservatism to adhere to a custom so obviously out of joint, nor radicalism to effect a change so slight. Indeed such a change would be conservative. It would not disrupt the curriculum. It is not catyclismic in effect. It cannot be argued that algebra is needed in the teaching of geometry, for elementary geometry was completed before algebra was dreamed of.

Elementary algebra *is* needed in the teaching of physics, but the high school student comes to his physics in his junior or senior year. If the proposed change were made he would have the necessary algebra less remote in point of time. Many teachers of physics complain of the student's inability to perform the most elementary operations in algebra. The interchange would tend to obviate this difficulty.

The secondary school is necessarily the people's college and should direct its efforts to the training of the majority of its students for life. The change proposed cannot militate against the effectiveness of its curriculum to this end. If, as I believe is true, that, under the proposed change, the pupil is less likely to acquire a distaste for mathematics and the training it is designed to give, the value of the curriculum to the end in view will be increased.

To the minority who go beyond the high school, the proposed change would be an advantage. The University, or college freshman is afraid of the algebra because he has not had it for four years. The high school senior who elects his half-year of advanced algebra will have the two ends of his course in algebra with less of a break between. Continuity, or approximate continuity, at least, in any course is an advantage. Viewed from any point, the change appears advantageous. Why do we not make this change, then? Were the makers of curricula all born in China and so addicted to ancestor worship that they must continue to walk backward with their eyes fixed upon the past?

This interchange is not a panacea for all the ills that may afflict the curriculum nor is it advocated as an ideal arrangement. As Professor Young says, it would be better, if possible, to teach the algebra and geometry side by side. An ideal will not be attained, as already hinted, until we learn to teach *mathematics*.

The interchange of geometry and algebra is a first step in this direction, a step that can be made at once, without disrupting the present curriculum and without calling for new text books in mathematics.

The complete change to a more rational course in mathematics will necessitate the discarding of separate texts upon the so-called "branches" of mathematics. Such a total change in concept and content cannot be made abruptly, but it is time the first step toward it

should be taken. Criticism has already fallen upon the mathematics of the secondary school, that at present it does not perform its duty as part of the curriculum of a fitting school for life. If that be so, the time is ripe for a change. Let the first step be taken.

Let the old order change and yield place to new
That God may fulfill himself in many ways
Lest one good custom should corrupt the world.

Prof. Dowling's paper was discussed by Principal J. S. Miller, Burlington, and Principal L. S. Keeley, Mayville. Principal Miller's discussion follows in part:

DISCUSSION OF PROF. DOWLING'S PAPER.

J. S. Miller.

A great change for the better has taken place in the teaching of Mathematics in the schools. Along two lines has it occurred: First, in the character and content of the text books used in the schools, and second in the attitude of the teacher. Mathematics was considered a dry, dead, lifeless subject chiefly because the text book writers persisted in cluttering their books with worthless, useless, complicated processes which have no relation to the actual needs of the scholar when he becomes the mechanic or the business man; true discount and compound proportion, for instance, and the 40 or 50 miscellaneous puzzles at the end of fractions. This stuff is all dead wood. It was interesting to note, however, that the cry to eliminate this dry rot came, in the main, from outside of the schools. Mathematics is dry and lifeless only when the teacher of Algebra and Geometry and Arithmetic is dry and lifeless. When the teacher enters into the subject with life and energy, and is no more ashamed to enthuse over an equation falling to pieces than is the physicist in watching an experiment—then, and only then, can we get the proper spirit and life into our teaching of Mathematics.

The excellent change in the curriculum suggested to us by Dr. Dowling is broad and far reaching in its scope. It deals with one great fundamental change from the present course of study—the inter-change of Algebra and Geometry. But when we contemplate a change in the years when Algebra and Geometry shall be taught we are compelled to consider all the Mathematics of the High School and probably of the grades also. Among the questions which Dr. Dowling has left for our consideration are:

1. In what years shall Geometry, Algebra, Arithmetic and Physics be taught?

2. How much time shall be given to each branch of Mathematics as we teach it at present?

3. How much of each subject shall be taught?

It is evident to all that we cannot interchange Algebra and Geometry in point of years and leave the content of each as at present. Freshmen cannot absorb the present Junior Geometry in one year nor can the Junior be allowed a year to complete Freshman Algebra. A change in text books may be necessary and even desirable. We are not entirely ready for the teaching of Mathematics but we certainly are ready for one or two steps in that direction.

The first step necessary for this reorganization is to take Algebra out of the first year and substitute for it Commercial Arithmetic and Book-keeping. It is not a valid reason to say, as has been said in some higher circles, that, Arithmetic should not be taught in the first year of the High School because the Freshman on entering the Higher School should be given a change to arouse his interest. Then after a year of abstract reasoning in Algebra to bring him back to earth with concrete yards of calico and bushels of corn. In this artificial attempt to arouse interest we have sacrificed the very continuity which we are striving to attain for the 3rd and 4th year students between Algebra, Geometry, Physics and University Algebra. I have watched with considerable interest this fall a class of Sophomores in Commercial Arithmetic which is less able to handle Commercial Arithmetic than eighth graders. What is the reason? During the two last years of the grades the boy and girl gets a thorough drill in Arithmetic. They have minds stocked with processes—they are just at the point where continued drill and extended application would fix and rivet what they have learned. Why then do we feel compelled to stop teaching them so much Arithmetic in the 8th grade and substitute Algebra for it when they are just entering into the right understanding of this subject. Algebra has no place in the graded school curriculum any more than Trigonometry has in the High School curriculum. They both sank to such levels by pressure from above. The colleges had no time to teach Trigonometry. It was puerile. So was Elementary Algebra childish. It had to go down to the grades. When we take Algebra out of the 9th year, it will naturally be withdrawn from the overcrowded graded school curriculum. Let me call to your minds the pedagogical nonsense which the Committee of fifteen gave in Boston a few years ago: "Your committee believe that with the wise use of time and right methods of teaching, five years are long enough for the study of mere Arithmetic—the five years beginning with the second and ending with the sixth school year. The 7th and 8th years should be given to the Algebraic Method." This report crystallized the sentiment in favor of "Algebra to the grades," and as a result of this and similar innovations, the outside, practical work-a-day world have raised a hue and cry to teach their children

what will be of benefit to them in after life. Take this abstract reasoning out of the 8th and 9th years and substitute for it, Arithmetic, Commercial Arithmetic, and applied Commercial Arithmetic, continuously, without a break, to the 8th, 9th and if necessary through the 10th year—and Wisconsin will not need so many private business colleges, nor the public schools be criticized so badly for what they teach and fail to teach.

Prof. James says, "It is in the association of concretes that the child's mind takes most delight!" Now that the Arithmetic of the 8th and 9th years have dealt with concrete facts and applied the processes to bookkeeping, the scholar is ready to continue in another line of concrete thinking, namely: Plane Geometry. Geometry at present, is taught in the second half of the 10th year and in the 11th year. Why not make it a 10th year subject entirely? Is it too difficult for pupils of that age? Then reserve Solid Geometry for the 11th year and make it elective. If a full year is given to plane Geometry, as it should be in the second year, solid Geometry and Algebra can be offered in the 11th. A full semester should be given to the study of solid Geometry as it is now taught or should be taught.

Algebra for Juniors will differ in point of time from Algebra for Freshmen. The Freshman cannot grasp the abstract quickly—two years later he will make greater headway. In one semester he will be able to master all the Algebra necessary for him.

Should he be a prospective college of engineering student, which, by the way, he will know by that time, he can then elect a second semester of Quadratics and Advanced Algebra to prepare him for his higher mathematics. His Geometry and Algebra would then be drawn closer to his mathematical physics, and the physics teacher would not need to re-teach him Algebra in the 4th year.

Can the Utilitarian standard be applied to the teaching of Mathematics? In a limited form. As Prof. Hudson says "Algebra should be taught because it is a part of mathematical truth." It is a branch of human knowledge. But as Prof. Smith of Columbia remarked—"for the merchant, the lawyer, and even the mechanic it is of slight practical value." Who uses Algebra? the mathematician. Who uses Geometry? the mason, the carpenter, the builder, the decorator, the surveyor, etc. etc.

It is a question in the minds of a great many thinking men outside of the profession whether Algebra should be taught in the High School at all. We would not see Algebra eliminated from the High School curriculum but he would like to see it given its proper time and space and importance. As has happened in the teaching of Arithmetic, the layman may determine the position and importance of Algebra for us should we fail to do so ourselves.

The suggestive outline of the course in Mathematics would then be:

8th. Grade—Arithmetic (no algebra).

High School—

1st. Year—Arithmetic and Book keeping. (They should be taught together and begin the teaching of Mathematics.

2nd. Year—Plane Geometry.

3rd. Year—

1st. Semester—Solid Geometry. (elective)

2nd. Semester—Algebra.

4th. Year: Physics—Advanced Algebra (½ year elective)

It is questionable whether this second semester of Algebra should be offered at all in the High School while we graduate poor readers, poor spellers, poor penmen—and when our graduates show such a lack of the most important branch of our knowledge—the English language.

The following is a part of Principal L. S. Keeley's discussion of Professor Dowling's paper:

DISCUSSION OF PROF. DOWLING'S PAPER.

It is admitted for this discussion that the points in Prof. Dowling's paper relating to the better qualifications of teachers are well taken. We agree that the changes in text-books from the stereotyped to the mere suggestive is a decided improvement.

The greatest need of the profession now is not teachers with more knowledge, but teachers who can better communicate their acquired knowledge to others. A person may be a good scholar and not be qualified to teach school. The teacher must have a mastery of his knowledge and he must have acquired a readiness to apprehend the thoughts of others. Too often the teacher fails to discriminate between a recitation that is memorized and one that is thoroughly prepared. It is not always easy to make this distinction. Then, too, it is the trained teacher who knows whether a student is failing because of inaccurate knowledge or because of inadequate language. A person may be "learned in all the lore of wise men," and yet fail to acquire a readiness to see and to remove difficulties in the way of the boys and girls in school. Give us better trained teacners because they can avoid the extremes of too much and too little, and they come nearest to giving just that help that will enable the pupil to help himself.

Coming to the subject of Algebra, I agree that it should not come in the first year of the high school course, but I would not displace it there with Geometry. I would devote the whole of the first year of the High School work in mathematics to Arithmetic and Book-keeping, and for the following reasons:

First—These studies are better suited to the advancement of pupils at this period than are Algebra and Geometry, and should they leave before completing the course they are of more value to them in the practical concerns of life.

Second—Business men declare that students who complete Arithmetic in the grades below the high school are deficient, and they ask that the graduates of high schools may have Arithmetic and Bookkeeping as a part of their high school course.

Third—In the enrichment of our courses of study we have diverted attention from Arithmetic, and students have lost their grip on it. County Superintendents say that poor work is being done in Arithmetic in the country schools. It devolves largely upon the high schools to give the necessary education to remedy the defect, for many country school teachers receive their preparation in the high schools.

Fourth—The "mortality" in Algebra, the floundering in L. C. M., and in other departments of the study will be largely reduced. I shall not say wholly reduced, because mortality in this study arises from other causes than those mentioned in the paper.

I should place Algebra in the second year of the high school course. While it is an abstract subject, much of it can be taught concretely. It is universal arithmetic and it logically follows that subject. It includes arithmetic although in some respects it differs very widely from it. Properly presented in the high school, it should confirm in the pupils many of their arithmetical experiences and emphasize the fundamental operations in that subject.

As our preparatory courses of study are constructed and carried out, as most of our text-books on geometry are now, that subject is too abstruse for the average first year student, and it should not be given to him unless preceded by elementary geometry in the grades below. I should place it in the fourth year of the high school, because taking our course in mathematics in the elementary schools, the preparatory work, the text-books and other things into consideration, the average student requires all of the mental power that he has developed up to this time to understand and master the subject.

MINUTES OF THE MEETING OF THE WISCONSIN MODERN LANGUAGE TEACHERS' ASSOCIATION.

President—Leo Stern, Assistant Superintendent, Milwaukee, Wis.

Vice President—B. Mack Dresden, Oshkosh Normal School, Oshkosh, Wis.

Secretary and Treasurer—George J. Lenz, National German American Teachers' Seminary, Milwaukee, Wis.

The annual meeting of the Wisconsin Modern Language Teachers' Association was called to order by the chairman, Leo Stern, Friday, November 5, 1909, at Juneau Hall of the Auditorium, at 3:15 p. m. The program was as follows:

1. Professor C. M. Purin, East Division High School, Milwaukee, presented the topic, "Is the Present College Graduate Sufficiently Equipped to Teach a Modern Language in the High School?" The speaker criticised the training which modern language teachers receive in most colleges and universities as hardly sufficient; there is too much theory and very little chance for practice. A few colleges and universities are connected with a teachers' college where students may get the necessary experience in pedagogics, where they may learn to apply the principles and methods with which they have become familiar in their theoretical work. Some universities have their own High Schools in which to train teachers for High School positions, and candidates have to teach there for some time before they can be granted a certificate. Up to the present time the University of Wisconsin has no such training school for teachers so that its graduates lack such pedagogical training as a progressive school system can expect. The practice of having elementary subjects at the university taught by assistants who have no previous experience in teaching should be condemned. Mr. Purin also suggested that better work could be obtained from the university if the elementary subjects were eliminated altogether from the list of studies and if the High Schools were required to do this work. The following resolutions were submitted with this paper:

1. That the legislative authorities of the State of Wisconsin be urged to appropriate sufficient funds for the establishment of a Teachers' College for secondary instruction in the city of Milwaukee, where ample opportunities may be had for observation and practice work. Senior standing to be considered a prerequisite for admission. The course to extend over a period of two years, leading to the degree of Master of Arts.

2. That this Teachers' College be a part of the State University System and be placed under the direct supervision of the university. The cooperation of the school superintendents and school supervisors of Milwaukee assisted by a staff of specially appointed High School teachers to be required in the conduction of the observation and practice work of the students.

3. That all elementary language work, particularly that of modern languages, be eliminated from the university curriculum. That a minimum of three years High School work in German or French must be presented for entrance to the University of Wisconsin by students intending to major in one of these languages. In addition to this, three

years of College German or French to be required for admission to the Modern Language Department of the Teachers' College.

4. That the above resolutions, if adopted, be made known and submitted,

(a) to the Board of Regents of the University of Wisconsin,

(b) to the University President, and

(c) to the Head Professors of the various departments at our State University.

As to the courses which the department of modern languages in the Teachers' College ought to require of all students preparing to teach these languages, the following may be suggested as essential:

1. Modern German (French) Grammar.
2. History of the German (French) language.
3. Mythology and Folklore.
4. General Survey of German (French) literature.
5. Drama and novel of the 19th. century and recent literary development.
6. History of German (French) Civilization.
7. Principles of Education.
8. History of Education.
9. Organization, Equipment, and management of secondary schools.
10. The schools of Germany, France, England, and the U. S.
11. Discussion of texts generally used in High Schools.
12. Theory and Practice of Teaching German (French).

In connection with this course students ought to be made familiar with words like,

(a) Bahlsens, Teaching of Modern Languages.

(b) Brebners, Method of Teaching Modern Languages in Germany.

(c) Bagster-Collins, German in Secondary Schools.

(d) Report of the Committee of Twelve.

(e) The report of the year books of the University of Chicago Press. (e. g., the 2nd, 3rd, and 4th year books), and such other publications as may from time to time appear.

In the discussion of this paper, Professor A. R. Hohlfeld of the University of Wisconsin pointed out the immense expenditure necessitated if it should be desired to carry out Mr. Purin's plan. He also called attention to some technical difficulties. Professor H. S. Goodnight of the University of Wisconsin also took part in the discussion, his chief aim being to show that the University of Wisconsin was not to be blamed for a number of reproaches which Mr. Purin had laid upon institutions of higher learning in general. He declared that conditions at Madison were much more favorable in many respects than elsewhere.

With regard to the resolutions proposed with this paper the meeting agreed to a compromise as suggested by Professor Goodnight:

Realizing that the best educational interests of the State would be materially advanced by affording to university students preparing to teach, in addition to the work now given, sufficient opportunity for practice teaching under competent supervision, the Wisconsin Modern Language Teachers' Association, assembled in their annual meeting, hereby respectfully petitions the Legislature to take immediate measures toward this end, voting sufficient funds for its accomplishment.

2. "The Modern Language Instruction in Germany—What can we learn from it?" was the subject of Professor M. B. Evans of the University of Wisconsin. "Two things," he says, "would strike the American language teacher:

1. The great amount of oral work, with closed books, both on the part of the individual pupils and of the entire class, or of groups of the class, in chorus.

2. The comparatively small extent of the ground covered.

Too many even among the best of our teachers are inclined to measure the progress of a class by the number of pages covered. At the Meisterschule in Frankfort on the Main, Professor Max Walter devoted 8 to 9 hours in Untersekunda, where the pupils had already studied French for five consecutive years, to the mastery of a single page, but then it had become part and parcel of their mental make-up. We need much more intensive work, even if that shall mean a decrease in the number of pages read. There are two phases of the oral work in Frankfort that are of special interest:

1. Actions as the basis of the first oral practice.

2. Development of the active vocabulary.

The advocates of the direct method made use but a few years ago of pictures as the basis of the first oral work. Now Walter has relegated observation to a somewhat secondary position. In its stead he has placed action, more especially the actions of the pupil. If these oral exercises accomplish nothing more, they will at least accustom the pupils to hearing and using the foreign idiom; and those of us who attempt to use this method in our classes with students who have spent two or three years in the study of the language will no longer be met with that astonished, helpless and injured expression which seems to say: What is the fool talking about?

The main source for the increased acquisition in vocabulary is to be well-ordered reading material, entirely within the comprehension of the pupil and of an interesting nature. In Frankfort the pupil must not only know the separate word, he must also remember its connection in the passage where he first met it, and be able to give this in

the foreign language. The use of synonyms and opposites was continually emphasized; and special attention paid to derivatives—and what a field this last opens to those of us who are teachers of German.

In our schools more language work should be done in the classroom and the home work ought to be partly prepared in the class. But after all, all questions of method are of secondary importance, the ultimate success of any school system lies in its teachers. And this is the great lesson that we still have to learn from the German higher schools. Their teachers can only be compared with the teachers in our great universities and best colleges and normal schools.

I am not a pessimist as regards the future of our schools; I believe firmly that conditions are gradually bettering, but in two directions, where Germany is by far our superior, must lie our most active efforts: we must work to elevate the standard of the teacher, and we must work to arouse a more lively consciousness in our own ranks that we belong to that we belong to that professional body to which more than to any other has been entrusted the moral and intellectual progress of our country.

The discussion of this paper was introduced by Miss Edna Zinn of the State Normal School at River Falls.

Miss M. V. Keller of the North Division High School, Milwaukee, read a paper, "To what extent should Grammar enter the study of German in the Primary School and in the Two-Year High School Course?"

"Imitation and practice alone are not sufficient to acquire a foreign language thoroughly, therefore grammar must have a place in the elementary instruction of German to develop what is termed "Sprachgefuhl" and "Sprachbewusstsein." To what extent should it be taught? It is ever the means, never the end to learn how to use the foreign idiom correctly. "Systematic language exercises" emphasizing some grammatical facts or principles should be given just as soon as the child has overcome the first difficulties in reading and writing. Attention should be directed to the fact that there are so-called "der-Wörter, die-Wörter, and das-Wörter," when studying the gender from the very beginning. The teacher may ask for the names of objects in the room to drill the correct use of the gender of nouns, or he may write a number of predicates on the board for which the pupil will be required to supply nouns with the definite article. After this the indefinite article may be practiced and the personal pronoun of the third person be substituted for the noun, the plural of nouns, etc. So by steps each principle will be acquired. The development of the simple sentence to lead to the correct application of prepositions, declensions and conjugations should be the work of the seventh and eighth grades. President, Leo Stern, Milwaukee.

Secretary and Treasurer—C. M. Purin, East Division High School, Milwaukee, Wis.

Executive Committee—Officers Elect, ex-officio; A. R. Hohlfeld, University of Wisconsin, Madison, Wis.; Miss Elizabeth Waters, Fond du Lac High School, Fond du Lac, Wis.; Miss Adelaide E. Wilke, Monroe High School, Monroe, Wis.. F. O. Read, University of Wisconsin, Madison, Wis.

G. J. LENZ,
Secretary.

MINUTES OF THE HISTORY CONFERENCE.

Walker Hall, Auditorium Building.

Friday, 3 P. M.

Chairman—G. M. Morrissey, Superintendent of Schools, Chilton.

"The Use of the Text Book," Prof. G. C. Sellery, University of Wisconsin, Madison.

Discussion—Prof. R. G. Patterson, Stevens Point Normal School; Prin. H. A. Melcher, Delavan; Miss Martha Sell, Madison; Prof. Carl E. Pray, Milwaukee Normal School.

At the conclusion of the above program those present took steps toward organizing a History Teachers' Association.

Upon motion of Miss Gertrude Hull, seconded by Prof. Pray, a committee was appointed to draw up a plan of organization to be submitted at the next meeting of the State Association at the History Conference. The said committee was also to prepare a program for the 1910 meeting.

Chairman Morrissey appointed Miss Gertrude Hull, Prof. George C. Sellery and Prof. Carl Pray as such committee.

LURA BURCE,
Secretary College, Normal and Hight School Section.

CITY GRADED SCHOOL SECTION.

In Auditorium.

Thursday, 2 P. M.

Chairman—S. B. Tobey, Wausau.

Secretary—Carmen Savage, Marinette.

The meeting was called to order by Supt. S. B. Tobey.

The first number on the program was a chorus by Milwaukee Public School children, conducted by Mrs. Frances E. Clark.

Mr. Orville T. Bright was then introduced and read a very instructive and interesting paper on "Outdoor Art for the School and Home." By means of pictures, this paper was made very much more emphatic. Comparisons were made of places which had been decorated by means of flowers, vines and trees, and of those which had not been thus decorated. A plea was made for more decoration of our homes, schools and other public places.

Prof. A. J. Hulton of the Wisconsin Industrial School for Boys, read the following paper on "Punishments:"

Punishments may be justified on several grounds:

1. As deterents to crime in others than the offenders.
2. The profection of society.
3. The reformation of the offender.

A good penal system should serve all three of these purposes. I confess I have never been able to see the inherent justice in punishing Peter as a warning to Paul, unless the punishment of Peter can be justified for the sake of Peter without any reference to Paul. The warning to Paul is an incidental good in the punishment of Peter—a consideration by no means to be overlooked, but not the determining consideration. Society must protect itself against incorrigible offenders. In the career of every hardened criminal there comes a point at which the determining consideration in inflicting penalties upon him must be the safe-guarding of society against him. Broadly speaking, the main purpose of punishment is beneficent toward the offender. What punishment will most surely and permanently benefit him is the determining consideration. All other considerations are incidental and secondary.

A penal system to be effective, then, must be *corrective*. It must be corrective as applied to the individual offender. It must be corrective as applied to the social conditions that produce him. This principle holds in the family, the school, and in all the wider fields of government. Society—the home society—the school society, society at large, while punishing its criminals, must not propagate crime. Crime is a disease, an effect. Its causes must be discovered and removed. This universal principle stated formally in words sounds like an axiom, and yet one does not need to think very long or very deeply to realize how generally it is neglected in practice. The father that smokes and drinks and blasphemes can not make punishment very effective in keeping his son free from these vices. It is not wise or just to provide open saloons and then punish men for drinking. The virtues that make our homes pleasant and comfortable, fit places for the rearing of souls, and not wholly for the exhibition of bric-a-brac, are taught most effectively by parental example. The efficacy of parental *chas-*

tisement is measured exactly by the faithfulness of parental adherence to well-doing. The whole catalogue of the school virtues—such as punctuality, regularity, obedience, industry, silence, accuracy, neatness, require the proper atmosphere for their growth. They can not be thrashed into a boy by any teacher, certainly not by a teacher conspicuously lacking in them all.

Poverty is one of the causes of crime. You can't cure it with a stick no matter how big; Satan finds some mischief still for idle hands to do. Idleness, or, more properly, laziness, is one of the causes of poverty. There are other causes not so evident but quite as potent. Bad housing, improper and scanty food, lack of play grounds, parks and other breathing places, and of rational amusements and recreations, are all breeders of crime. Many amiable qualities have their origin in a sound stomach. Dyspepsia is the mother of many crimes. All these things and many others must be considered by any one whose duty it is to administer wisely an effective penal system.

Vengeance must be rigorously excluded in the use of penalties. Every offender is entitled to a careful diagnosis of his case and to the best remedial measures suited to it. I know a good many vagrants without homes, incorrigibles, without correctors, criminals born in the atmosphere and trained in the practice of crime. They are entitled to just and rational treatment—to justice administered in wisdom and tempered with mercy. No penalty should be inflicted in anger toward the offender, no matter how heinous the offense. I am told the mule is a very provoking animal. Many a mule is punished not for the good of the mule, but for the relief of the feelings of the driver. I am not an authority on mules. I have spent forty years of my life in the study of boys. I do not claim to be an authority on boys, I have not been with them long enough. Boys are a fascinating study. Some old Greek said "The boy is the most ferocious of wild beasts Like the mule, he has surpassing powers of exasperation, and there is an incalculable unexpectedness in his movements. Unless one keeps himself constantly in a philosophic mood, he tries one's patience and most of his other virtues. I do not know about the orthodoxy of the old nursery rhyme beginning,

"Let dogs delight to bark and bite,
For God hath made them so;
Let bears and lions growl and fight,
For 'tis their nature to."

I remember that when, as a small boy, I was under maternal discipline for the exhibition of certain ancestral traits not altogether blameworthy in a member of a warlike nation, I used to envy the dogs and

bears and lions that could let their angry passions rise and growl and fight to their heart's delight. It may be, as the rhymes seem to imply, that there are undesirable traits in boys, divinely ordained to be suppressed, as similar traits in dogs, bears and lions are divinely ordained for free activity. You remember the hymn proceeds:

"But children, you should never let
Your angry passions rise;
Your little hands were never made
To tear each other's eyes."

Poor boys—denied the joys of life freely given to the dogs and bears and lions! I fear I shall never see the *justice* of the arrangement. Mules are not included in the little hymn, and so presumably, like boys, they are excluded from the privileged classes. The natural desires, tendencies, inclinations of mules and boys are to be thwarted and suppressed. The driver of the mule and the pedagogue—the leader of the boy—must each understand his animal. The leader of the boy must have self-control, judicial sanity, a strong will and a firm hand. He must not punish the boy for "his own satisfaction." He must make the offender feel that the penalty imposed upon him is the natural consequence of his offense. It should come to him like the jar of a fall, the smart of a cut, the bite of a burn—not so swiftly, perhaps, but just as inevitably.

I have said a good penal system must be corrective. To be corrective, it must be disciplinary and educational.

The great majority of first offenders are not purposely criminal. They sin in ignorance. We are made what we are by heredity and environment. John Locke thought that in the making of men heredity counts for one-tenth and environment for nine-tenths. I do not know about the relative potency of these formative factors. They *are* the formative factors. Vicious hereditary tendencies may be overcome by persistent suppression. Potential goodness, hereditary or otherwise, may be made actual by discipline and training. Men do not grow up like the flower of the field or the ox of the stall. If they are allowed to grow up like Topsy, like Topsy they grow up wrong. You can not account for Emerson without taking note of his ancestry and of Concord and Boston. It takes a great deal of will power to make a man if he is made well. The social will exercises itself upon him in the great social institutions,—the home, the school, the church, and the various forms of civil government. It is well to thank God if one's lines have been cast in pleasant places and he has received a goodly heritage. He can not if he would, escape from the social laws in which the inherited and acquired wisdom of the race has embodied itself.

Society crushes the man that opposes its laws. Society effaces the man that has no will of his own. The individual will must work with, not against, the social will. The social will and the individual will, coöperating, make the man.

What has all this to do with the right use of penalties? Much every way. The right use of penalty requires discrimination. It involves the study of predisposing conditions. Who hath sinned, these men or their fathers, that they must be punished, What *right* has society, through any of its institutions, to touch a life penitively it has never touched beneficially? There are offenders that sin against great light, but there are more that sin in dense ignorance of the laws of righteousness. A child born in the slums of a great city, of ignorant, brutal, drunken, criminal parents, has no such chance as Emerson had. It is a cruel fate to be born in Sodom. It is not fair to judge and punish the child of crime as Emerson might have been judged and punished for the same outward offense. It may be that the criminal might have responded to the right influences if they had been brought to play upon him at the right time. It may be that he will now respond to them. So, while he is paying the penalty for his offense, the influences that might have kept him from becoming an offender should be tried upon him. It is better to do right tardily than not at all.

The dearest right of the child is the right to be controlled by the wisdom of his elders. The highest virtue in a child is the virtue of obedience. Tried by this test, the American child is not preeminent in virtue. He is humored, coaxed, managed too much and controlled and governed too little. Better formal obedience secured by pains and penalties than rampant lawlessness. Better still willing, ready obedience like that of the young boy who went down from Jerusalem and was subject to his parents.

We are held to our course in life by two sets of motions. These may be typified quite accurately by the hope of heaven and the fear of hell. Motives of the first class attract us from in front. They stimulate us to action by the hope of reward in numerous and diverse forms, —the approbation of our friends, the approval of conscience, and the consequent sense of worthiness. They are true motives. They stimulate to action, they endure through life. They become increasingly effective through use. I am wandering away from punishment. No, not wandering away but going away purposely. I wish I could keep away from it. All other qualifications equal, that governor is the best that accomplishes his purposes most perfectly and with the smallest use of punishment.

The motives typified by the fear of hell are less positive. They *inhibit* action quite as frequently as they incite to action. They re-

strain us from wrong doing through fear of punishment. Most of the commandments, in the decalogue and elsewhere are "Thou shalt nots." The fear of pending pain has always had a place in the making of men and in their reformation. Among the less intelligent classes much lawlessness and crime may be accounted for by the general skepticism about hell—I mean the old fashioned hell with its bottomless depths of burning sulphur. Every offender carries his hell around with him under his jacket wherever he goes. The hope of heaven is higher and better than the fear of hell. Even before one attains sainthood, the fear of hell may be practically eliminated from his thought. The good citizen refrains from horse-stealing, not through fear of the vigilance committee but because he has no desire to steal horses. If there were no vigilance committees or penitentiaries, he would not steal horses. He has outgrown the fear of punishment. He continues in his course and maintains his rectitude not through fear of evil, but through love of good. He has reached freedom from the fear of spur and whip, and pains, penalties, and punishment of every kind, but he finds his freedom, as every one must that finds it at all, in perfect obedience to law. I have a family of 320 boys. When I left home this afternoon, not all of them had attained to the perfect freedom under law. I must still continue to ponder the proper uses of punishment.

Fines and imprisonments are the most common penalties imposed by our courts. Usually imprisonment comes in default of payment of the fine, $50 or 60 days. The right use of these penalties requires that in proper cases sentence should be suspended and the offender put on probation under competent officers. The offender fined and unable to pay his fine should have the opportunity of earning it, the dread of imprisonment acting as spur to his industry and economy, two of the great correctors of crime. Youthful offenders and first offenders should not be kept with hardened criminals. Paroles and suspended sentences should be given in all hopeful cases. Many offenders need instruction, guidance, and encouragement more than punishment. Corrigible offenders should be sifted out from incorrigibles. Persistent offenders should be restrained of their liberty, but even then under disciplinary and educational conditions and indeterminate sentences. Every man restrained of his liberty should be made to work.

Every penal institution should have connected with it farms, gardens, workshops, libraries, schools, chapels and lecture rooms. Wholesome food, well cooked and served, good light, pure air, sufficient warmth in clothing and buildings and safe, sanitary conditions and appliances are indispensable. Robust health is a corrector of certain criminal tendencies. The corrigible offender is entitled to the use of every influence, physical, intellectual and spiritual that can be brought

to bear upon him with redemptive power. The making of men is the noblest work in which one may engage. Its positive side, the training and guidance of the young, is the more hopeful and fruitful side. When we shall squarely and honestly face the great problem of the incorrigible, we shall find ourselves thinking not less wisely and deeply than now about the proper use of penalties and punishments and much more wisely and deeply about the work of preventing incorrigibility through kinder, firmer and more rational and insistent training.

The public well alert, enlightened, is omnipotent for good. It has its opportunity while the child is still dependent and helpless. It should have the child under good control before he awakes to conscious living and realizes within himself the capacity of resistance. If the public will should clearly and strongly require that boys should not smoke, nor drink, nor blaspheme, nor indulge in indecent and vulgar talk nor commit unspeakable crimes against their own bodies, boys could not do these things. The man should abstain from them all for his own sake and still more for the sake of his son or the son of his neighbor if he wants him to grow up pure and clean. The fact that he does not so abstain is taken by the boy, and rightly, as proof that he does not very ardently desire him to abstain. The most fruitful source of incorrigibility is the unworthiness, inefficiency and bad example of the corrector.

The prevention of incorrigibility, or, to put it positively, the proper training of the young requires the raising of society and the whole of society to a higher moral plane. The submerged can not raise the submerged. The dead can only bury their dead. If we older folks would only walk ourselves in the road we desire our children to follow, that alone would nearly or quite suffice to bring them up right. Our children like Cornelia's are our jewels. We love and prize them. To provide well for their growing wants becomes our sweetest toil. But our love for them is not always quite strong enough or wise enough to enable us to get from them the highest and sweetest blessing—for their sakes to keep our hearts pure and our ways straight and clean.

I dwell upon the positive side of making and saving men but I have not forgotten my theme. Even here we must make our children partakers of chastisement. There must needs be penalties and punishments in the forming of men as in the reformation of men. It is the divine plan that the hope of heaven and the fear of hell uniting us and restraining us shall together move us on. Offenses must needs come and penalties must follow them. Rewards and punishments have a common purpose—to incite us to do right and restrain us from doing wrong. The saving of men is a blessed work.

Even in the use of pains, penalties and punishments it is a blessed work if one remembers always that the purpose of penalties and punishments is the correction and ultimate redemption of the offender.

INTERMEDIATE AND GRAMMAR GRADE TEACHERS' CONFERENCE.

Main Hall, Auditorium,

Thursday, 3 P. M.

Chairman—G. F. Loomis, Superintendent of Schools, Waukesha.

"Manual Work in the Intermediate and Upper Grades, and How to Make Room for it." T. R. Lloyd Jones, Superintendent of Schools, Fond du Lac.

"History in the Grades." H. C. Buell, Superintendent of Schools, Janesville.

"The Group Method," R. B. Dudgeon, Superintendent of Schools, Madison.

Topic for General Discussion: "Home Study—How Much and What Kind?"

CITY GRADED SCHOOL SECTION.

Auditorium, Friday, 2 P. M.

Chairman—G. W. Swartz, Chippewa Falls.

Because of the absence of the Chairman, the meeting was called to order by Supt. C. W. Rittenburg, Whitewater.

Prof. R. H. Whitbeck of the University of Wisconsin was introduced and read the following paper on "Where to Lay the Emphasis in Teaching Geography."

WHERE SHALL WE LAY THE EMPHASIS IN TEACHING GEOGRAPHY?

By R. H. Whitbeck, University of Wisconsin.

Sixty years ago, it was a common thing in schools to make a singing exercise of the geography lesson. I have recently seen a text book in which facts of geography were written in verse and fitted to the air of familiar songs. This did not then seem absurd.

Twenty-five years ago I studied a text book which called upon the pupil to describe some 400 or 500 rivers and creeks, to locate scores

of capes, islands, bays, straits, mountain peaks, etc., and well toward 2,000 cities and towns scattered over the earth. Nor did this seem absurd at the time. But gradually its absurdity dawned upon men and a reform was started. Then the reform movement had to be reformed. Now we are in that process. We are seeking to be sane and practical in deciding what to teach and what to emphasize. From the great mass of available geographical material, we must make a selection. What shall be our test in deciding what to teach and what to omit?

It is my conviction that we ought to lay the emphasis upon those facts which are likely to prove most *useful* to the average man or woman.

Every educated person is supposed to possess a certain fund of information about the countries, cities, peoples and industries of the world: about its great rivers, its mountains and plains and deserts. The treatment of such topics is the province of geography. It is true that a good many fundamental notions of geography may be gained by observation, under the direction of a good teacher. And the value of field and observational lessons—the first hand study of the home region—is to be encouraged. But the practical difficulties—and they are numerous—in the way of taking classes into the country or out into the city or anywhere away from the school, are so great that we can not expect much of it to be done in large cities. That teacher who does as much as she can is to be commended. But in the last analysis it will be found that a valuable, yet *very small* part of the pupil's knowledge of geography is gained or can be gained by observation.

Some people have emphasized the wisdom of making geography more largely a reasoning study: of leading pupils to reason out the facts which they acquire. This, too, is an ideal worth striving for. The older geography came into disrepute because it ignored the value of reasoning. The mild revolution ushered in by the Report of the Committee of Ten was a protest against the old method and the old subject matter of geography. It was too largely a memory study, too largely a book study, too largely an unthinking study.

With the zeal characteristic of Americans, as soon as we saw our error we began to correct it with a vengeance. We recognized the faults which the Committee of Ten pointed out. We recognized the calibre of the men who made the report and some of us—not all—hastened to bathe in the effulgence of the so-called New or Rational Geography.

A new text-book came out, apparently modelled along the lines recommended by the report of the Committee. As nearly as I can compute it, not less than 65% of the text of that book dealt with

mathematical and physical geography, especially physical. Man and his industries, his trades, his cities, his governments, and his customs received but scanty attention. Highlands and lowlands, slopes, divides, young rivers and old rivers, young mountains, mature mountains, and old mountains, relief maps, and wind maps received the emphasis. Not a colored political map occurred in the first half of the book. The only really good maps were bunched in the back of the book after the tables and pronouncing vocabulary. They seemed to apologize for their presence in the book at all. Yet the book sold in fabulous numbers. It spread over the country like wild fire. Going into the hands of teachers trained in the older type of geography, the book and its new method of treatment created no little confusion. The plain fact is, the book and the type of geography which it presented was not adapted to elementary pupils. There was too much about cold, lifeless physical features, and too little about people. The inborn interest of children, old and young, is in people, the people of China, of Japan, of Australia, not in the configuration of the land, the drainage, or the details of climate. Suffice it to say that when the revised edition of this pioneer "new" geography came out, it was a changed creature. The amount of emphasis placed upon purely physical matters was greatly reduced. Political and commercial maps came back into the body of the book. Man and man's work claimed a greatly increased proportion of space. The school men of the country, backed up by three or four million children, had decreed that in elementary geography at least, the emphasis does not belong on the physical side. And what is scarcely less remarkable, is the movement going on now, this very year, in the field of high school and college geography. It is in exactly the same direction—away from the over emphasis of the physical, and toward a greater emphasis on the human side. Read the recent report of the special committee on high school geography, presented at the N. E. A. at Denver last summer, and watch for the forthcoming report of a similar committee of the Association of American Geographers, to be presented at Boston this winter.

The basis of geography lies in physiography and climate, yet those are not the phases to be emphasized in the lower schools. Do not misunderstand me—physiography and climate are very important, they should not be neglected; their influence upon man's affairs is too great. But, in order to teach the larger effects of mountains, for example, upon human activities, we need not teach the genesis, classification, or geological structure of mountains first.

My main contentions thus far are:

1. That however desirable it may be, yet, unfortunately it is not practicable to teach very much geography by observation.

2. That reasoning on the part of pupils, as fully as they reasonably can do it, is surely desired but only moderately possible, because the little people have too small a basis of experience to do much real reasoning.

3. That, after all, most of the geography must be learned from books, maps and pictures; that the memory is the faculty most largely called into use; that memory is a perfectly respectable faculty, worthy of use and cultivation, despite the disrepute into which it has fallen in some quarters. No one defends memorizing of mere words without thought. No one defends parrot work.

4. That, granting the fundamental importance of the physical side of geography, nevertheless, knowledge of it is rather more a means to an end than an end in itself in the lower schools.

5. That the human side of the study is the side that most appeals to children, is most useful in the affairs of after life, and is entitled to the greater emphasis.

Permit me now to be more specific. I would lay considerable emphasis upon the use and study of maps. To become able mentally to picture a map, and its main features, is a valuable acquisition, one of the most valuable legacies of the geography class. In this spasm of reform that we have been passing through, map studies have been a little neglected. The high schools, normal schools and colleges, while always scolding the elementary schools for their numerous shortcomings, are on better ground than usual when they complain of the poor knowledge of location manifested by the recent crops of grammar school graduates. I have no hesitation in saying, however, that the upper schools, and particularly the colleges are guilty of worse mistakes and that on the whole, the best teaching in America today is done in the elementary schools. Yet, I would like to plead with you to lay a little more emphasis on studies in location. Map drawing may be overdone, yet it is one of the very best ways to teach some phases of geography. It does tend to imprint those mental pictures of maps which are so useful to every educated person. Pupils like to make maps, especially with colors, and will often do much extra and voluntary work of this kind because it does appeal to them.

My second plea is for a thoughtful discrimination between geographical facts that are fundamental and those that are only incidental; a plea that teachers shall select a few points in connection with a country or region, points that her judgment tells her are consequential, and then pound those in until they stick. The number of such facts is, after all, relatively small. But these few facts ought to stand out in our teaching like headlines in a newspaper. Did you ever think what skill head-line writers manifest in

sorting out the crucial things in a news article, and thus enabling us to get the general news of the day by simply reading the headings?

The other evening I picked up one of our best grammar school geographies. I opened to the section on Belgium. There are 114 different facts given there about Belgium. Among a hundred well educated people not ten could tell off hand a quarter of these 114 facts. I think that nearly every fact of the 114 is of general interest and worthy of a place in a school geography, yet not over an eighth of them deserve to be drilled or reviewed. My hope is that you teachers will thoughtfully go over such a section as that on Belgium, underline the 14 significant facts and lay the emphasis upon them, letting the 100 interesting but incidental facts drift away into the inner chambers of the pupil's memory, where only a mere residum will remain. Yet this residue really makes for intelligence.

For example, our pupil ought to have it well drilled in that the great factory city of Brussels, and the great port of Antwerp, and the great battle field of Waterloo are in little Belgium, the most densely populated of nations, whose people manufacture so much that their country is styled "The Workshop of Europe."

Nearly every country has some things that are characteristic, very characteristic; as Germany's military system and educational system; Holland's dykes, canals, and windmills; England's wonderful colonial empire, unequaled ocean commerce, matchless merchant fleet and navy; the Frenchman's artistic taste in manufacturing, etc., etc. Upon these characteristic things in each country, I would lay the emphasis. In many cases the causes which led up to such important results are clear and are within the understanding of even grammar school children. If so, do not neglect them. The causal notion is the keynote of modern geography. The almost inevitable tendency is to teach too many things and discriminate too little between big things and little.

I should not care much, for example, about the products or the commerce of Italy, but I should care to know about its famous cities, its ruins, and its past. In the case of Russia, the opposite is true. There the cities and the past are less important than the struggles of the present. In Switzerland, I would emphasize the Alps, their passes, their valleys, and the fierce spirit of liberty and democracy which they breed. In Norway, I would emphasize the wonderful fiords which have so strongly molded the national character from the days of the Vikings downward to the present; but on the other hand, I would emphasize the achievements of the Japanese and the peculiar customs, traits and institutions of the Chinese.

I should like my pupils to catch something of the spirit of some of the peoples of whom they study, and I should not hesitate now and

then to wander away a little into history or literature in order that my pupils might catch a glimpse of the splendid spirit of some of these peoples. The story of William Tell belongs to the geography of Switzerland for it takes the air of the Alps to breed the spirit of a Tell. The story of the encounter of James Fitz James and Roderick Dhu is part of the geography of Scotland. There could have been no such types of men had there been no highlands and no lowlands. I would make the story of Phœbe Cary's "The Leak in the Dike" a part of the geography lesson on Holland; the beautiful story of little Peter who found the tiny stream trickling down the side of the dike, knew its fearful meaning and,

"He forces back the weight of the sea,
With the strength of his single arm."

* * * * * * *

"And his deed shall be sung by the cradle,
And told to the child on the knee,
So long as the dikes of Holland,
Divide the land from the sea."

I am not unmindful that things of this kind are so alluring that they easily lead the class away from the more prosy, yet absolutely necessary drill upon matters of location, commerce, industry, etc. The interesting stories are legitimate, yet it must be conceded that they are incidental, rather than fundamental.

At the present time I have a class of 125 freshmen in the University. They are studying physical geography. You would scarcely believe some of the things I could tell you of their lack of knowledge, of the common things of elementary geography. Ten out of a section of 30 did not know what longitude is; not one could give accurately the causes of the changes of the seasons. Many could not tell in what country such cities as Vienna, Naples, Liverpool, and Rio Janeiro are. Very few indeed of the world's great rivers seemed to be at all familiar to them. I know this is the old story, but I wonder if there is not a remedy. I wonder if this lack of knowledge about large geographical facts does not in part result from an attempt to teach too many facts, the location of too many places, the names of too many rivers. Would it not be practicable for this association to select a committee which should attempt to prepare a list of cities, of rivers, of mountains, of bodies of water, which ought to be very thoroughly taught and reviewed until their locations are permanently learned; until the pupils come to know them so well that they can not forget where they are. I recognize the difficulty of securing anything like agreement on such lists, yet we tried such a plan one summer at Cornell University and got a fair approach to agreement among the members of the committee.

Prof. F. E. Mitchell of the Oshkosh Normal School read the following discussion of Prof. Whitbeck's paper:

LAYING THE EMPHASIS IN GEOGRAPHY—DISCUSSION.

While agreeing in the main with the speaker, there are a few suggestions I should like to make in the nature of additions to, rather than in criticism of, the material just presented.

A few things well studied are better than many things learned. It may seem paradoxical, but we study the things we know.

Everybody knew that apples fell from the tree as well as Sir Isaac Newton, but he studied the phenomena. Watt was not the first to note the expansive power of steam, but he was the first to study it.

My experience with students from the grades and high school is that they seldom if ever study anything. They have not the time. They are rushing from one subject to another. It reminds one of Jules Verne's trips around the world in eighty days. He saw but little of what might be seen on this journey. The fact is he was not out to see, he was out to get around in the shortest possible time. So with the student. In this hurly burly of ours, he is not after knowledge, wisdom, understanding, his desire is to get through, and to get through as little travel stained as possible.

The purpose of geography is to make the child acquainted with the earth. In nature we have few laws and many manifestations. There are only two laws of gravity but their application is infinite, and how foolish it would seem to memorize the manifestations of these laws when a study of the laws would explain each and every one of these manifestations.

There are few different things in geography, few fundamental propositions, and it does seem to me that these fundamental propositions should be mastered somewhere, sometime.

The child must be given a basis for interpreting geographical data. Mr. Whitbeck states it well when he says the test to be used in selecting material is its probable usefulness. It is unfortunate that this word usefulness is capable of two interpretations. If he means usefulness in the sense that a trade or profession is useful in getting a living, I would say no, but if he means usefulness in the sense of enabling the individual to better understand and shape his environment, I would say yes.

The people of one land do not do different things from the people of other lands, but they do the same things differently. When we learn how other people have solved the problems that confront them it will be most useful knowledge in the solution of the problems that confront us. But to be more explicit; in the study of Germany the

pupil discovers that by means of locks and canals nearly every mile of river in Germany is available for carrying on commerce. The pupil should not stop here, but should be led to see that water rates are cheap rates, and that low rates of transportation are an advantage to labor because:

1. Increase the amount of labor to be done.
2. Employment to a larger number of workers.
3. Increase wages.
4. Higher standard of living.
5. Increase the amount of goods to be transported.
6. Increase the wealth of the whole country.

To capital:

1. Increase the demand for capital.
2. Increase the profits of capital.
3. Increase the amount of goods produced.
4. Increase the manufacturing profits.
5. Extends the territory within which the manufacturer can do business at a profit.

To the consumer:

1. Cheaper goods.
2. Increase in the buying power of his capital.
3. Raise the general standard of living.

Following the discussion on geography, Hon. Francis E. McGovern addressed the meeting on "Ideal versus the Actual in Public Education." Mr. McGovern appealed strongly to the sentiments of his hearers as was shown by their applause. His arguments for smaller numbers in classes, fewer distributions in the course of study and opportunity for specialization all coincided with the views of those present.

INTERMEDIATE AND GRAMMAR GRADE TEACHERS' CONFERENCE.

Auditorium, Friday, 3 p. m.

Chairman—T. J. Jones, Supt. of Schools, West Allis.

"The Lost Art of Penmanship, and What to do About It." H. F. Leverenz, Superintendent of Schools, Sheboygan.

"Strength and Weaknesses of Eighth Grade Graduates as Shown by Their High School Work." Paul G. W. Keller, Principal of High School, Appleton.

"Geography in the Grades, C. E. Patzer, Supervisor of Practice, State Normal School, Milwaukee.

Topic for General Discussion: "Is State Supervision of City Graded Schools Necessary or Desirable?"

PRIMARY TEACHERS' CONFERENCE.

Kilbourn Hall, Auditorium Building, Thursday, 3 p. m.

Chairman—G. O. Banting, Superintendent of Schools, Stoughton.

"Industrial Work in the Primary Grades." Miss Ethel Barr, Racine.

Discussion led by Miss Mamie Ames, Stoughton.

Exercises in Music—Primary Class, Milwaukee.

"The Moral and Ethical Opportunity of the School Day." Mrs. Mary D. Bradford, Whitewater.

Prof. Banting called the meeting to order. He then introduced Mrs. Mary Bradford, who read the following paper on "The Moral and Ethical Opportunity of the School Day."

The end and aim of life is the development of character. The five great agencies which exist for the furtherance of this aim are the home, the school, the vocation, the state, and the church, and each has its own particular function to perform. The cry has gone out, make the school a more efficient agency in the development of character, make it a greater safeguard to the nation's virtues; for it is the training of its young towards right conduct that determines what the moral health of any community shall be; communities make the state, and states make the nation.

So we see that to develop in the young habits of thinking the right, and doing the right, is to perform the highest patriotic service.

That the home is shifting more and more upon the school its share of responsibility is a generally deplored fact. That the average American home is not only "falling short" as an agency in moral training, but that it is often positively detrimental to the efforts of the teacher, has received recent forcible corroboration in a report based upon an investigation that brought within its scope not less than a thousand schools of our country. Two of the conclusions are pertinent here: "The deep interest which teachers the world over are taking in the problem of moral training through the agency of the public school," and 'The general condemnation of the American home and social life as a hindrance to the teacher in the development of character."

This means an added responsibility which the schools must assume until the slow operation of causes making for betterment, brings about an improved social condition, and a more responsible parenthood.

No weightier problem, then, can engage the attention of teachers than that of how to make every detail, every relation, every activity connected with the daily life of the school, contribute to the building up of character. My subject implies that for every school, every day there are opportunities for moral instruction,—instruction, which

though purposed, is for the most part indirectly given through the varied activities of the school.

The ideas that are of distinct value in moral education, and are legitimate to hold up in school, may be classified under two heads: those of duty to self, and duty to others. The duties to himself which the school-life of the child should continually emphasize are: acquiring knowledge, care of his body, and control of wrong feelings, as anger and jealousy. The fundamental notion to instil into the child's mind as to his duty to others is that he can not act as an individual by himself, but must fill his place in the school community. He must respect the rights and interests of others; be willing to co-operate for common ends, and give willing service,—be helpful.

The activities and interests of the school which are the teacher's means for impressing these ideas, and for guiding conduct to accord with them, may be classified as follows:

(1) The regulations of the school in regard to tardiness, attendance, order.

(2) Punishments.

(3) Physical activities and health.

(4) The management of the recitation.

(5) The various subjects of the course.

The moral opportunities afforded by the first class have been well employed when pupils have been brought to feel that the school is not the teacher's school but their school; when they have caught the idea of co-partnership in and responsibility for the order and care of the school; when they understand that the regulations and rules are for the benefit of all and willingly comply with them; and when they expect no rights or privileges which all others may not enjoy.

Punishment that logically follows the wrong-doing should follow it, and such may have a positive effect upon character.

Teachers and parents often do not realize the great possibilities for character-building that exist in play. They repress the play instinct, when if they let it do its work for the child, it will in time pass out of his life as naturally and readily as the tail of the tadpole is absorbed when there is need of the legs of the frog. The gains to the mental and moral life through play are as great as those to the body. Justice is taught and moderation, self-control, truthfulness, loyalty, courage, and perseverance.

It is most encouraging to find that the relation of health to morals is becoming a matter of common recognition. To work for healthy growth and development, for better ventilation, for relief from fatigue through exercise is to work for improvement in morals; for so directly and strongly do the moral and physical sides of a child's nature react

on each other that moral growth is scarcely possible unless physical conditions are right.

When we come to the management of the class recitation, the morality of certain prevalent practices must be seriously questioned. Too often is rivalry resorted to as an incentive to learning. Jealousy, which needs to be controlled, is, instead, developed by neglect to give recognition to honest effort,—as when the best work is posted instead of that which shows most improvement. Immoral habits of fault-finding, of looking for mistakes, for the bad things instead of for the good, are fostered by methods of class criticism. When the teacher is fully alive to her opportunities for character-making, she creates out of the class a sympathetic company, in which each member may without fear perform his part. In this atmosphere, self-control and self-direction have a chance to develop rapidly and naturally.

Some of the studies of the course are non-moral so far as content is concerned. They affect the life by helping to form habits that are beneficial to the child as a social being. Such are science, mathematics, and manual training. There are other subjects that influence character by establishing ideals. They help to a realization of what constitutes right conduct and are, therefore, more instructive in nature. These are history and literature, the subjects which are given the leading place by all teachers as a means to moral teaching, both direct and indirect.

Music develops feelings of social unity. All forms of art give training to taste, which is a feeling of delight in the beautiful in all of its forms. Between the aesthetic and moral there is close relation.

There are many who believe that besides the moral training and instruction made possible, incidentally, through the various activities and interests of the regular school *regime*, there should be provision in the program for more formal teaching. But the important question is not whether the great end of education is to be gained by formal or informal means, but whether it is purposed, and the means wisely used.

The personality of the teacher is the determining factor. The secret sources of personality are difficult to analyze; but every one who is cultivating sympathy and insight is growing in power to influence for good. With these must go the power of example.

As a final word, let me urge you, teachers, to think grandly of your work. What if your ideal be not realized? What if the combined work of our generation seem to result in little apparent uplift? The world is surely better for every effort made, for every lofty aim, advanced even a little. Let us believe with Browning,—

"There shall never be one lost good."

PRIMARY TEACHERS' CONFERENCE.

Kilbourn Hall, Auditorium Building,
Friday, 3 p. m.

Chairman—Margaret Canty, Primary Supervisor, Milwaukee.

Flower Songs—Pupils in costume. Mrs. Frances E. Clark, Supervisor of Music, Milwaukee, Director.

"Phonics as an Aid in the Mechanics of Reading." Miss Edith A. Klein, Madison.

Discussion—Led by Miss Harriet E. Smith, Principal of the Eighth Dist. School No. 3, Milwaukee.

Exercise in Reading—First Grade Pupils. Tenth Dist. School No. 4, Milwaukee.

Address—"Expression in the Primary Grades." W. H. Sanders, Supervisor of Practice, State Normal School, La Crosse.

CARMEN SAVAGE,
Secretary.

KINDERGARTEN SECTION.

Chairman—Miss Caroline W. Barbour, Principal Kindergarten Training Department, Superior State Normal School.

Layton Hall, Auditorium Building,
November 5, 1909.

The meeting was called to order by the chairman, Miss C. W. Barbour, at 3 p. m., and the following program on "The Outdoor Problem of the Kindergarten" was given.

Address—"Nature Work In and Out of Door." Miss Stella M. Wood, Principal Minneapolis Kindergarten Training School.

Address—"The Morality of Out-of-Door Training for Children." Miss Clara D. Hitchcock, Director of Kindergarten, Primary Department, La Crosse State Normal School.

Discussion—Practical suggestions from workers over the state as to ways and means of providing more outdoor work of various kinds during school time.

Discussion—"How can the interest in the kindergarten which the amendment awakened, be utilized to promote kindergarten progress?" Miss Nina C. Vandewalker, Principal Kindergarten Training Department, Milwaukee State Normal School.

Games—Suggestive Games for out of doors, played by kindergarteners under the direction of Miss Marion Smith, Director of Kindergarten, Fourteenth District School, Milwaukee.

In her discussion on Nature Work, Miss Wood said that "The purpose of nature study is not to teach scientific facts, although many and valuable facts will be acquired. Neither should a nature study course be planned as a preparation for science. It will furnish a most excellent basis for future high school science and agriculture, into one or the other of which it should gradually blend; but that is not its object. The purpose is to develop the mind and heart of the little child to teach him to see accurately and think clearly, and to see and think along lines that will bring him into intelligent sympathy with his environment, thereby broadening and enriching his life."

"Love of nature, the child's birthright. Our task is not to arouse his interest in nature, but to give him sympathetic response, and to direct his observation. Difference between the nature lover, and the nature student. All nature lovers become nature students, but it is possible for a mere nature student not to be a nature lover.

Sympathy with nature leads to study of nature, and this to understanding. The child is in unity with nature if the adult does not disturb him. Froebel in the Education of Man says, "The boy may with his spiritual eye find, see, and apprehend the life of surrounding nature, but he fails to find the same feelings among adults who suppress that germinating life in its very beginning." "The boy seeks from adults the confirmation of his inner, spiritual anticipations, and justly so, from an intuitive sense of what the elder ought to be, and from respect for his elder. If he fails to find it, a double effect follows: loss of respect for the elder, and a recoil of the original inner anticipation. Therefore it is so important that boys and adults should go into the fields and forests, together striving to receive into their hearts and minds the life and spirit of nature."

"Children are remarkably free from innate fears; adults must refrain from passing on foolish prejudices to the child; fear limits. As illustration of foolish and ignorant prejudice, witness that against the "harmless, necessary" toad, whose services are said to be worth $40 a year to the farmer, and whose wonderful tongue, moulting habit, and life history of eggs, tadpole, and adult, are full of interest to the children. An intelligent person should scorn to pass on the old wives' tale that warts are contracted by contact with the rough coat of the toad.

"The garter snake most commonly seen by children is harmless, and is of service in the destruction of insects, though it has a bad habit of eating frogs and birds. The much maligned bat is another useful animal, whose purpose is not to light upon the head of the unwary onlooker, but to devour the night-flying insects, thus acting as policeman for our comfort.

"The dragon-fly catches mosquitoes in his "leg basket," and is not the "darning needle" of dreadful reputation. His life history, from the egg laid in the pond, the nymph, and then the gorgeous winged adult, is one of the fairy tales of science. Let us clear the path of the interested child of all foolish adult obstruction. To aid him, knowledge is desirable, sympathy *indispensable.*

There is a magic in *together.* It is a refreshing experience to the child to tell the teacher something the teacher does not already know. In a group recently one pupil told with delight of seeing a monarch butterfly bathe under the sprinkler of the hose; another had seen a squirrel tear to pieces and devour a mushroom, and was able to explain to a friend why she always found that some one had been before her, no matter how early she went to the park for mushrooms. Another had caught a bit of the exquisite song which the blue jay reserves for his nearest and dearest, and which only a few favored humans have heard. Another saw a caterpillar moult his hairy coat, and another really saw a toad literally peel off his coat, and swallow it. The joy of these original observers in telling their observations to a sympathetic listener was something to be remembered. Sympathetic interest in nature unites young and old as nothing else can.

Take your senses with you when you journey into the world of nature. Do not look and not see. Ruskin says "The more I think of it, I find this conclusion more impressed upon me, that the greatest thing a human soul ever does in the world is to see something. Hundreds of people can talk for one who can think, but thousands can think for one who can see clearly. To see clearly is poetry, prophecy, and religion, all in one."

How many of the common things about us we do not really see. How many know the number of the toes of a cat? Have seen the flowers of the oak? The distinguishing mark on the coat of the father sparrow? The robin's bill?

Olive Thorne Miller once visited a friend who greeted her with the remark that she was afraid she would find her visit dull, as there were few birds in the trees near the house. In a few moments Mrs. Miller remarked "I have seen twenty-two in these few moments." A world of new sensations awaits us would we but use our eyes and ears. Most of us do not really see and hear what is about us. The automobiles take people rushing by untold beauties, and we go abstractedly along the footpath way, missing the beauties which would give us relief from self-absorbtion did we but attend.

"Touch with Nature at first hand is the very breath of mental life." In it there is health, joy, growth.

"Individual sorrow, suffering, and limitation, lose the exaggerated

importance with which our feelings invest them when we recognize the range and depth of the movement of universal life. One may become excited when he looks at the affairs of his own neighborhood, but a glimpse of the universe makes that excitement appear unreal and ridiculous. The sense of proportion is freshened by the consciousness of relation to the totality of things, and the sense of proportion is one of the signs of sanity." "IMMORTAL GROWTH IS THE PROPHECY WHICH NATURE MAKES FOR MAN."

Miss Hitchcock, in discussing Out-of-Door Training, said:

We are fast moving beyond the time when even that conservative authority called Public Opinion regards morality as a virtue taught exclusively by the church or any strictly religious organization. We are, instead, coming to know that standards of morality permeate every act of life, and that opportunities for establishing these moral standards begin with the first day in the cradle and crowd each other thick and fast through all the plastic years of life.

About every act of life there cluster varying standards of morality and every standard has varying degrees of attainment. We know it is moral to be true, to be honest, but we speak of a lying or thieving child as non-moral rather than im-moral. We feel that such a child simply has gotten a wrong emphasis upon a right activity,—"the cart before the horse." From such considerations, we see that standards of morality depend not only on the deed itself, the physical aspect, but also on the thought preceding the action, or the mental aspect, and back of this the feeling for and the will to do the right thing, which we call the spiritual aspect. *Morality, therefore, is the complete activity of these three phases functioning in right relationships to each other.* Immorality is an inversion of power. The lesser deliberately rules the greater; the physical, for instance, is dominant at the expense of the mental or spiritual. In non-morality these right relationships are also disturbed, but not deliberately.

Morality is found not only in the deeds of human beings individually but in organizations and in institutions; therefore we apply the tests of morality to education and question it as to its rightness of aim and method.

The morality of any training rests first of all upon experience as its essential factor; secondly, upon what is done with experience,—how it is utilized. We have two tests then by which we determine if any training be moral:

Is it founded upon experience?

What is gained by that experience?

Experiences are vastly different from impressions. Impressions may be the beginning of experiences but they are, rather, the fleeting, the

evanescent sensations that do not take hold of the whole organism; they merely penetrate the outer cuticle, while an experience gets down into the quick and occasions a sort of spontaneous combustion of energy that results in activity of some sort. Impressions have to do with the surface but an experience has to do with the inner life. "It is that which we know and realize in curselves;" hence, an experience brings ideas.

The differing effect of impressions and experiences finds no more striking illustration than in the behavior of that passive type of little child who spends all too much time on his own door-step, fronting some busy street. Countless millions of impressions of the ceaseless traffic register themselves in his mind, but no activity results, no idea. He seems mentally dazed. The budding mental processes are rather benumbed than stimulated.

When such a child first comes to kindergarten he is often as inert and unresponsive as a little lump of clay, but after a month or so there is a change in his action,—in his very facial expression. Something in the kindergarten life has taken hold of him; something has touched the quick; somehow he has gained an experience. He knows and realizes something in himself and he begins to act in relation to that realization. What may be a passing impression to a grown person may be an experience to a child. It requires constant, watchful study to keep within the range of little children's capacities, but it must be done if the foundations are to be well laid.

The second and third qualities are Vividness and Recency. With adult minds we can rely on memory to recall the feeling of a past experience, but with a little child that feeling must be recent in order to be vivid. Such feelings are born only from actual doing,—not playing at doing. Froebel said truly, "We learn by doing." The playing at doing is, and must always be regarded in a moral training as the expression of an experience, and not the experience itself.

A fourth quality is repetition. In repetition there must be an element of variety. Although the old proverb is still true, "Line upon line and precept upon precept," every new presentation of an old lesson not only drives the old lesson in deeper but it forms another anchor line to hold it fast in Memory's Associations. We do not repeat enough. We go too fast. We move too rapidly in our subject matter, our topics of conversation, so that the child's mind does not have time to play about these various phases of our topics and to organize, in this way, his experiences, by his variety of associations. We move too rapidly in the use of our materials. We forget that material itself is an experience and that the sensations of it as an experience must pass from the realm of consciousness into that of

subconsciousness before the child can use it as a medium for the expression of a totally different idea.

There is a way of testing experience which is always applicable. If a child has had "one," he will either converse about it, ask questions about it, or do something related to it. This is the way he unconsciously attempts to interpret it and this brings us to our second test of Morality in Training. What is gained by experience? What should grown people gain by experience?

Experience should make us more useful members of society; it should bring us personal efficiency or power; it should bring us control; it should bring us a sense of values. This is exactly true, also, for little children. Experience should bring them personal efficiency, control, and a sense of values. To gain this, experience needs an interpretor. Here lies the responsibility and the function of the teacher. She must arrange opportunities for experiences that are most worth while and then she must help interpret their values to the child in terms of his own understanding. This is the only way he can become an efficient member of his own social group.

Is Out-of-Door Training more moral than In-Door? Not if the in-door training be an expression of the out-door experience. All of our in-door work is, in reality, based on out-door life, and this is wherein the morality of out-door training consists, since experience necessarily precedes expression. The teacher is to arrange for the experience that is worth while and then she is to lift it to a higher level of meaning.

The child's attitude toward the world is quite the scientific one. He is after facts about his surroundings. The Out-Door experiences seem, therefore, to be the essential thing to plan, first of all because they present those facts in which, next to people, the child is most interested and which he most needs to have interpreted to him. His out-door surroundings are the basis for future activities and they represent typical experiences or permanent values. These values are largely subjective but if the child gets hold of the objective side, the facts,—the other is pretty sure to follow later.

Froebel had very positive views of nature in relation to education and to morality and conduct. In his address before the Queen of Saxony, he speaks of "an idea very dear to man, highly simple, but rich in its development, to make Nature in its external laws of unfolding and life the foundation of human and childhood education." Nature as both objective and spiritual appealed to him strongly. The laws of Nature typified to him spiritual laws and processes. Physical relationships typified spiritual relationships.

Children begin their love of Nature from a utilitarian rather than an aesthetic standpoint. Someone has said that we do not love trees

until after we have loved a tree. However, it is the trees that furnish something to eat,—nuts, maple sugar, some favorite fruit, or that furnish play material,—acorns, sling-shots, willow whistles, about which children's affections first seem to cling.

Even the flowers suggest practical purposes, a "doing" of some kind; daisies and dandelions for chains, or to tell your fortune, or whether your mother wants you, daisies that make queer little men with chin whiskers when you pull their petals; buttercups to see if you like butter, and all the flowers with quaint notions about them suggestive of people; lady-slippers, bleeding hearts, pansies with queer little faces and the step-mother story and the little man with his feet in the tub.

Quaint, wholesome fancies of the out-door world are one of the best moral safeguards.

The Morality of Out-Door Training lies in its being the fundamental experience of all experiences, because it furnishes the beginnings of all the so-called "spiritual possessions of the race,"—the scientific, the social, the aesthetic, the literary, the religious, and the problem of education is to unite the child with the civilization of the race and the ideals for which it is striving.

Out-Door training furnishes one of the best bases for the development of social relations because there is less of the restraint of habit and custom found in the usual in-door work, and there is, therefore, greater opportunity for individual temperament to express itself and thus come under the control of social ideals.

If Out-Door training is so essential, what about the poor city children? Our first step is to know this truth so surely and believe it so earnestly that we create a public opinion that will rise up and provide every school with a garden ground as well as a play ground. Meanwhile we must continue to learn of Nature ourselves and bring as many bits of her to the children as we can.

This is not an extra burden of one more thing to do, even for any of us who feel that we have so little Nature love to start with. It means the best kind of recreation and soul refreshment, and one of the first things one should learn of Nature is that she accomplishes what she does, not by hurrying, but by just steadily keeping at it. One ring a year marks the growth of a tree, and the only difference between the big tree and the little is that the big one has kept at it longer.

Miss Jane Robbins, Superior Normal School; Miss Ruth Norton, Milwaukee Normal School; Miss Cora Ramsey, Platteville Normal School; Miss Childs and Miss Doyle, Milwaukee, suggested tours of inspection and tours of observation to things of and to points of interest reasonably near by. Also childrens' ownership of and interest in small

truck or flower gardens at school or at home, backed by the sympathy, supervision and co-operation of parents and teachers as a means of more out-of-door work during school time.

Miss Marion Smith, Director of Kindergarten, Milwaukee, assisted by volunteer kindergartners from the audience, presented many new pleasing games which were enjoyed by the participants and spectators alike.

Miss Nina C. Vandewalker, Milwaukee Normal Kindergarten Training Department, closed the meeting with the following paper:

During the past year the kindergarten has passed a crisis in the state of Wisconsin, since the proposed amendment to the constitution, raising the school age from four years to six, has been defeated. The amendment in question was not proposed because of any opposition to the kindergarten, but because the presence of children of kinder garten age was supposed to add to the difficulties of the rural school. In the attempt to improve the conditions in the rural school, the friends of the measure lost sight of the needs of the children in the cities. Because the amendment would have made it illegal to spend public money for the education of children below the age of six, its passage would have eliminated the kindergarten from the school system of Wisconsin.

The defeat of the amendment was the result of a campaign of education in behalf of the kindergarten, undertaken by the Federation of Women's Clubs, and the kindergartners and their friends in the teaching ranks. As a consequence of that campaign, many people who had given the kindergarten but little thought, gave it a careful consideration. It was the interest thus awakened that secured the defeat of the amendment. The friends of the kindergarten cannot be satisfied with having prevented its elimination, however, great as such a service has been. There are a hundred or more cities and towns in the state that have adopted the kindergarten, but there are nearly a hundred fifty still that have not done so. There is need, therefore, of pushing the movement, and there is no time more opportune than the present, while the public interest is still alive. The kindergartners of the state have, therefor, a responsibility at this juncture. It is incumbent upon each one to make her own kindergarten an argument for kindergartens everywhere, and to acquaint her community with the general purposes that underlie kindergarten procedure. But has she not a larger duty even than this—that of seeing that the kindergarten is discussed at women's clubs and teachers' meetings? And who can be more interested than she in seeing that the library in her community is supplied with appropriate books on the kindergarten? Work along these and similar lines has been done during the past

year in many cities in the state. It should be continued until the kindergarten is recognized as a necessary part of every city school system.

RUTH A. DREUTZER,
Secretary.

COUNTY SUPERINTENDENTS' AND COUNTY TRAINING TEACHERS' SECTION.

Chairman—W. E. Smith, Principal of County Training School, Waushara.

Secretary—Winifred Edsall, County Training School, Richland Center.

Treasurer—S. Miles Thomas, Principal of County Training School, Columbus.

Meeting called to order by the chairman and the scheduled program proceeded to at once. The first speaker, Miss Annie Reynolds, of the Sauk County Training School, read a paper on "The Duty of the Training School to Prepare for Social Life." The paper in part follows:

The finest equipment for social life comes incidentally to a few. These favored ones seem to breathe in a knowledge of the social amenities. But if the young people of the country communities of Wisconsin are to get it, we, the county training school teachers, must give it first to their future teachers. Every girl who is one of our pupils will meet and greet, or by failing to greet pleasantly, so fail to hearten, many or few acquaintances; will travel few or many miles; will earn her living a shorter or a longer time; will be a member of some home all her life; will eat three meals a day; will often act as guest or as hostess; she will need the friendship of good men and women. Why then should we not prepare her for these everyday occurrences? Let us practice introducing the girls to one another so that they may know how to do it easily. Let us teach them that a short, sharp nod may be transformed into a gracious bow. Not all of them know, unless through us, the need of not attracting attention while on a train, or the ethics of seat ownership while traveling. Before a girl begins to earn her living, she may easily learn how to stand correction, how to conform and obliterate herself, how to work as her employer wants it done and not cry while he is telling her about it; how important it is that she keep her promises and do what she has agreed to do. To fit her for home life she will need to admire and to strive for, a conciliatory, adaptable disposition as in every home there are conflicting interests.

it may be a revelation to let the girls ask questions regarding table manners. Even the keeping of the knife in subjection to the fork may be new to them in practice. The passing of food to others, the cordial recognition of late comers to the meal on the part of those already at the table, the realization that a meal eaten in silence resembles more than it should, the meals of the lower animals, and so it should be spiritualized by conversation—is not even the world with which you and I are most familiar, often a stranger to these things? Certainly the world our pupils inhabit, is. We may find students who under-rate the importance of manners. Let us remind them that "Good manners aid dealing and conversation, as a railroad aids travel, by getting rid of avoidable obstacles and leaving nothing to be conquered but space," that "Manners form the cloak that virtue wears when she goes abroad." We must cultivate in them the right attitude so they will read books on the fine art of behavior, and learn from the well bred people they meet.

Let us surround hospitality with all the glamour we can, and occasionally, at least, have gatherings in which lively games are played. Let us give our students memories of active participation in a frolic. We may picture for them the ideal hostess who makes every guest feel as if she were the hostess; the ideal guest who does incalculable good because of what she brings to the family which no one can ever take away from them. Friendship grows from acquaintanceship but even the latter needs our stimulation. Let us call on the girls and suggest that they call on one another. Those who most need this relaxation may not respond to the first suggestion, so let us persevere until every girl has called on every other girl who is to graduate with her. We can help the girls to enact the miracle of friendship so that they shall never again doubt its possibility or its woundrous beauty. We can make them certain that "No material success in life is comparable to success in friendship." We can exalt the good of mutual trust, of loyalty, of service, and of comradeship. Woman's organizations have done much along this line but country women are still often doubters as to the value, nay, even the realty of friendship among women.

Let us not forget to socialize the curriculum. The stories the girls learn to tell, the poems they can recite, the songs they can sing, the lists of words on whose pronunciation they are drilled, the correct forms of sentences, which they repeat very frequently so that they will not use the often heard incorrect forms, the emphasis laid on vocabulary gain in language, and the important place given to conversation in that subject; the dramatizing of such classics as the Peterkin Papers, the weekly reports on current events, the many

library books on which they report and the oral reading they are encouraged to do every day at home—all these events are well adapted to fit our students for social life, if we who teach them have social life in mind when teaching them, and continually encourage the students to share these accomplishments with others.

It is true that the every day life of every good school does much to fit its pupils to become participators in the social life of their communities. Even the teacher who doesn't work with this end in view, often sees timidity, awkwardness and self-consciousness become less common. However, I think that the class of students with whom it is our privilege to work, need more than this indirect help. Since it is women who give directions to the manners of a country, let us acquaint these young women with the causes of seeming rudeness: haste, preoccupation, thoughtlessness, are unlovely traits which they will gladly avoid if we point the way to better things. If "The secret of perpetual youth is the power to coax and capture the new," as the years go on, every person needs to continually enlarge her circle of acquaintances. She needs to form the habit of being versatile and not conservative, of graciously acknowledging and unobtrusively giving gifts; of writing letters of courtesy promptly. Why should we not get our girls in the way of forming these habits?

Besides the lines of work already suggested a series of talks may well be given on such subjects as the essentials of a lady, of a home, how a woman reveals herself through her dress, speech, and appearance, her treatment of elderly people, and of the weak. The home topic might well be summarized thus: all writers on social topics agree that much must be done if the home, which is of such incomparable importance is not to deteriorate. A home is a place where people care for one another. Its material expression, for the prosperous farmers of Wisconsin, should be a well built, well aired house, comfortable in temperature, well lighted, with books and pictures displaying taste in selection, having at least, a few well-cared-for plants, and delighting its inmates by disclosing as much beauty in dress, furniture, and table service as the family can afford. Let us sow the thought of wisely spending for the home and for the education of future home makers.

Some of you, doubtless, are afraid that if the work suggested here is done, our pupils will write, "My popularity socially," in larger letters than they write, "The kind of work that I do." We have all seen the vivacious, enthusiastic, out-of-school teacher sit before her classes—she seldom stands—with so little energy, so much lassitude, accepting poor performance as if it were equally as satisfactory as

good performance, doing nothing to inspire, to urge or to reprove, and we do not approve of it. Do we?

I do not exalt tiring one's self out socially above tiring one's self out with house work or with church work in out-of-school hours. Unless outside interests send the well prepared teacher to school early in the morning, liking her work better than she would without them, they are injurious and should be condemned. Pupils should not sit at the second table of the teacher's mind. Unless in class a teacher's quick and electric vivacity of spirit acts as a breeze on the sluggish waters, unless in business hours she can set their mental machinery in motion, we shall not call her a good teacher, no matter if she is fair to look upon, and charming in manner. No social gifts and graces will atone for failure to make her school work her chief concern.

Excellent teaching is delightful work, but it is also exhaustive, and it is entitled to our best strength. Some of the great movements of the world call upon every teacher to enlist actively in their service. Many who do so find that this extra activity saps their strength, and causes them to do inefficiently the greatest thing any wage-earning woman can do: cooperate with the real mothers of the children in doing the mother work of the world. If mothers and teachers will bend their energies to so form children that later they will not need re-forming, much of the reform work will be unnecessary. But the argument for interest along the social lines considered in this paper, is, that it will help the teacher, the parents, and the children to do better work every day and at the same time it will make them happier and will help to save them.

I should place health and its attendant unselfish care of self, as the first social duty; not the health that the girls may have in their teens and in their early twenties, but the health that will last through all the years and enable the woman to do capable work in the world or in her home, and enable her too, to love life while doing it. If our students learn to talk as glibly as do many college students about not going to bed until twelve the night before, because we have urged them to become social beings, then we have injured them and not benefited them. We want our girls to recognize their limitations and be guided by them; to be able to lose self-consciousness in abandon and to work without strain; to have wills strong enough to shun small physical indulgences, including the formation of the candy habit.

If our pupils become alert in doing what they can to socialize the country, they will find it possible to do much: evening meetings, and annual picnics, visiting the pupils in their homes, encouraging the sending of exhibits to fairs, utilizing all possible opportunities to

chat with the men and women of the district are some of the avenues open to them. They will become interested in the children's coöperating in games, in no child's holding himself aloof from others. The work they have had in agriculture, sewing and domestic science will help them greatly to feel at home with people who spend most of their time farming, sewing or cooking.

May we help our students create a new type of country school teachers. Readers of good books, students of nature and of humanity, lovers of music, pictures, and children, exhibiting that vigorous plant whose branches, flowers and fruit we call good manners, they will go forth to help country people enlarge and enrich their lives in many ways; through them the neighborhood life is to receive a great impetus. A neighborhood's quickness to respond will depend largely on the degree of intelligence possessed by the people comprising it. This fund of intelligence must be increased. The country school should be the universal Alma Mater of every country pupil. No child of average mentality should leave it until he has won from it a diploma. One of the forward steps Wisconsin will take some time, we hope, is to require through legislation, that parents send their children to school until they secure this coveted possession—a country school diploma. Let us get our students interested in persuading their pupils to get some training for life beyond the country school, in the country school of agriculture and domestic science, in the country high school or in the county training school.

The future of the county training school will be all the greater if we teachers, especially we women, in the work now, set our seal of approval upon the social side, as well as the intellectual side of our work.

It is only by so doing that we can hope to train for the schools and homes of Wisconsin young women who shall have repose and not nerves; charm, and not eccentricity; adaptability, and not setness; who shall be neither frivolous in youth nor bitter in middle life but wholesome at all times; whose friends will not have to put up with wearisome incapacity or petty judgments; but who, because they are free from personal sensitiveness, are sensitive to all beauty; who will enter whole heartedly and without reserve into the task of raising the standard of the country life. I believe that we men and women can do this work, and that it is a task worth doing. Don't you?

Following a brief discussion of Miss Reynold's paper, Miss Lura Burce of Stevens Point read a paper on "The Relation of the Country Teachers' Course in the State Normal Schools to the County Training Schools," in which she said:

With 9,000 untrained teachers in the common schools of the state it is not for us to talk of the relation of one school to the other but to coöperate in considering how best to administer the course in both schools so that it will be most effective. If the State Normal can send out rural teachers as well trained as those sent out from the training schools, well and good. If she can "better the instruction," we will rejoice because the best is "none too good."

The act providing for the certification of those who complete the country school course in the State Normal, states that the course shall be a full and fair equivalent for the course offered by the Training School. The Board of Normal Regents in June, 1909, declared it to be its policy to so administer the course that the graduates teach only in country schools. The entrance requirements are the same.

It has been predicted by some that the new course would meet the fate of the old one year common school course which was never quite successful. The reason the one year course failed, was first, because there were no legal qualifications attached to it and the student who completed it had nothing which would allow him to teach; in the second place, those who planned the course failed to recognize that the rural school had a problem all its own and that the training given the ordinary student was not adequate for the rural teacher. If those who have the new course in charge lose sight of this fact or endeavor to substitute the theoretical for the actual, it too will become a failure.

The first and greatest essential for the success of such a course is to have it in the hands of competent people. It should be under the direct supervision of one familiar with every phase of the country school problem. The general methods, observation, and practice should be in charge of this person or one equally competent along the same line. The academic work should be given apart and separate from the work of the other courses of the school, and ought to be planned especially with the idea of giving the rural teacher that which he most needs. It might be given by the regular departmental teachers of the school. Music, Drawing, Domestic Science and Physical Training could be taken in the regular classes with the other students. Library work should be conducted with a typical township library and not in the general library classes of the school.

The State Normal can furnish excellent facilities for practice with its large model school, but ideal conditions for any course of this character, whether in Training School or Normal would be those in which the practice school is supplemented by an ungraded country school. Where transportation conditions are such as to make it possible to reach such a school, a plan of this kind might work out to advantage. The Normal might take charge of the rural school, super-

vise it and furnish the teaching force. With these conditions the district might be willing to expend the money it otherwise would pay for teachers' salaries, in improving the building and grounds, thus making it in reality a model school. To help carry out the model school idea, the art department of the Normal might direct the interior decorations, the music department might look after music, and the physical training department might provide for games and sports.

Another plan suggests itself to us as worthy of consideration. The district might be induced to take the money ordinarily used for teaching purposes and transport the pupils to the Normal building, where suitable quarters and equipment could be provided as for the regular model school. In either case the student teachers would have all the problems created by a typical country school, but in the latter instance the natural environment which is an important phase would be lacking. Work of this character must necessarily be carried on under the closest supervision to make it of value to either school.

While there are many especially strong advantages offered the rural teacher in the State Normal, such as well equipped laboratories, athletics and literary societies, there is a question whether this school with its broad field and various lines of activity can furnish the proper environment and spirit for the rural teacher. In the County Normal the student continually breathes the atmosphere of the rural school. His teachers and fellow students are imbued with a similar spirit and he has held constantly before him the object for which he puts forth his best efforts. So evident is his goal that almost never does a Training School graduate fail to give back to the county his services in return for his training. The rural student in the State Normal with nothing better in sight than a country school at $35 or $40 per month may feel a slight twinge of dissatisfaction when he stands shoulder to shoulder with comrades who have more exalted ideas of their futures. For this one reason if for no other, the more the work can be segregated the better.

The rural work in the State Normal is still in its infancy and many problems are yet to be solved. Oshkosh, Whitewater and La Crosse are this year experimenting along this line. Just whether it can be profitably introduced into every Normal in the state or not is a question. It may not be advisable where local conditions are unfavorable or where there are several Training Schools in the vicinity to take care of the students who desire this line of work. The courses in the three schools mentioned are reported well attended. In one, the attendance is unusually large, this being where the

Normal is quite remote from the County Training School. We must conclude from this that there is a demand for the course and the theory that students would not take rural work at a State Normal where other courses could be had, is disproved. It may be said in this connection that the requirements for admission to this course are lower than for any other in the school and the time required to secure legal qualifications to teach is less than for the elementary course. This may account in some measure for its popularity.

If, after the rural course has been carefully tried out in the Normal, it is found to meet the requirements and the expectations of those who are enthusiastic for it, there is another and a more advanced line of the work which might properly be considered. The higher institutions of our state are offering courses which will allow a teacher to specialize in almost any line of teaching—manual training, domestic science, music, kindergarten, languages, etc., but nowhere can a teacher specialize in rural school work. Where can one go if he wishes to become a Training School teacher or a County Superintendent? The Training School has come to stay and with it has come a profession differing from all other professions. There should be a place where strong teachers can receive instructions in rural school methods and supervision, which will especially fit them for this important line of work.

A discussion on the question of suitable opportunities for observation and practice work in the Training Courses for Country Teachers in the Normal Schools and County Training Schools followed Miss Burce's paper, whereat Chairman Smith suggested that further discussion be postponed until the next speaker had given his paper. Prof. Frederick G. Bonser, Director of the Training School, State Normal, Macomb, Ill., then presented his paper, "The Country School of Observation and Practice in the Preparation of Country School Teachers in a State Normal School." After some gracious introductory words in praise of Wisconsin's school system, Prof. Bonser said:

Having in mind, then, these four principles, namely:

1. That the great need in the country school teacher is power of scholarly leadership;

2. That the scholarship and training of the country school teacher should be equal to that of the teacher in a good elementary school anywhere;

3. That many of the problems of the country school are fundamentally different from those of the village and city schools; and

4. That specific equipment is necessary to demonstrate and provide training in solving the peculiar problems of country life—with these four principles in mind, the State Normal School at Macomb, Illinois,

secured the cooperation of a country school which it has used as a training school of demonstration, observation, and practice since September, 1906.

This school in District No. 56, McDonough county, bearing the prosaic name of the "Brickyard School," was a typically needy and neglected one-room country school, located nearly two miles out in the open country. The agreement made with the school board required that the Normal School should pay the teacher's salary, but that all other running expenses and any improvements that should be made should be met by the school district. The school board promised nothing in the way of improvements. The teacher has succeeded well, however, in leading them to see the value of many changes which they have cheerfully made. One specification made and lived up to was, that all business transacted by the school board should be at a regularly called meeting at which the teacher should be present.

With this agreement then, the school and the teacher went to work in September, 1906. A condition very common in all parts of our country existed here which gave the teacher a chance to get somewhat acquainted with nearly every family in the district before school began. She had to call upon nearly every home before she found a boarding place.

The building was a one-room, rectangular structure with a small hall protruding in front. The paper was old and dingy; the blackboards cracked and useless; the plaster missing in spots; the window panes, broken, gone, and paper-patched; the seats, old and double, and elaborately decorated with "the jack knife's carved initial." The stove, a large, unjacketed affair, stood in the middle of the room. The chimney above was braced by a wooden support from the floor. There was an old, worn out organ but no library. The yard was large and well shaded but marred in front by the usual, dilapidated coal house. The outbuildings were mere shells, disgracefully open and scant of boards. The children, as a whole, were typically average also. There had been no evident attempt at grading. There was but small appreciation of the value of daily school work, and less of the school as a functional source of growth in community life.

The teacher put in charge was an actual country teacher chosen from the rank and file of country teachers. But she is one of those country teachers distinguished in that she is the product of an excellent normal school, and in that every day since leaving the normal school she has kept right on growing. Our work was begun then, in a typically needy country school with an actual country teacher in charge. A careful and thorough study was made of physical and

social conditions. An earnest and hard-working campaign for a few months finally resulted in changing very materially for the better the physical conditions of the school house and grounds. The building was turned one quarter around and the hall or ante-room placed at one side, thereby improving the building in both utility and appearance. A basement with a coal room, a storage room, and a large open room for school use was put in. A furnace was installed. New blackboards were put in. The interior was remodelled and redecorated, and a bay window and window seat added to close the end left open by the removal of the hall. The boys of the school gave the house a new coat of paint, helped to finish up the basement into a fine room for recitations, manual training, or domestic science work, made a book case for the growing library, and made a number of other pieces of needed furniture. In time there were added some new seats, a dozen kindergarten chairs and a low table, window curtains, a clock, linoleum for the hall, a rug for the room, and several good pictures. A piano was bought and has been paid for largely through the help of the children. A bulletin board has been put up and is in daily use for the exhibition of work. The old coal house has been torn away and new out-houses erected. The front yard is now protected by a fence so built as to afford substantial hitch racks. This fence was painted by the school boys at intermissions. Work benches for manual training have also been made by the boys. The girls have been responsible for the sash curtains, for towels, and for numerous other elements of interior decoration. A mail box has been placed in front of the school house and the Chicago Record-Herald comes daily to the school. Cement walks now lead from the front gateway.—Now one point we would insist on here, is, that what has been done in this school along these lines can be done by any teacher who has the real teaching stuff in her and who knows what a school really ought to be and to have. It may take a little longer in some schools but it can be done by the teacher who so wills it.

But physical conditions, though highly important, are not to be exalted above social conditions. And just here I would urge the importance of using, for training purposes, a typical country school district with the school located in the country among the people themselves. In another state, a normal school has built a model country school house on its campus and the children are brought into this school in wagons from the country. Of course, physical conditions of this school house may be ideal. But how can this be thought of as a real country school? In our own school there has been a social awakening and the development of a strong school spirit. Parents and children alike take a conscious pride in what they have ac-

complished. They are patriotic and loyal to their school. It is *their* school. How would they feel toward it if it were located in the neighboring city and had been built by some one else without their coöperaton or perhaps even their assent? As I view the matter the *physical* considerations fall into almost a minimum of significance when compared with the *social* phases of the problem. Bringing the children to the city is only retarding the real country life movement—the keeping of the right kinds of boys and girls on the farms. The school should be in the country and the teacher should live largely in the district so that she may know intimately its needs, its limitations, and its possibilities, and share in every possible means for social uplift and upbuilding. Physical conditions are but means to social ends. One large phase of the problem is to make the daily school work in the various subjects reach out into the homes of the children in the district.—That the relations of the school and the homes may be vital, in our school the attempt is made to teach arithmetic so that the material used has actual, applicable value in solving the economic problems of the people in the community; geography is so adapted as to relate to their farms, their products, their purchases, and their relations through industry and commerce with all parts of the world; history is so taught as to bring them the experiences of all peoples and all times most valuable in teaching them the causes and consequences of different kinds of human conduct; language is so developed that the children grow in power to speak and write better the things they have to say and write in their daily lives; the manual arts are so presented that they produce increased insight and power in solving the constructive problems of home life; nature study and agriculture open the eyes of the boys and girls to the possibilities and interest and enjoyment and rich reward in growing grains, fruits, vegetables, flowers, and live stock intelligently; this work even affecting the farmers themselves so that they value and respect it and learn much for their own good from it; literature, art, and music are so taught as to bring a new joy and meaning to the daily routine of life—to furnish a means of using all leisure time profitably and enjoyably. The teacher has gone out into the homes of patrons to study their needs and to get their view points and to carry to them the view point and desire of the school to be a living, helpful thing in their work and in their whole lives. To illustrate this in two subjects I refer especially to the courses last year in agriculture and in domestic science which were developed immediately from local needs and conditions in the district. In agriculture, an elementary study of soil and soil fertilization with especial emphasis upon clay soils was made. This was followed by

two weeks' work in dairying and dairy cattle, given because several cows are kept by farmers of the district, among them a number of inferior ones, worthless for this purpose. Cutworms, moths, beetles, scales, etc., had begun to develop and cause trouble by this time and were therefore given the chief attention for a few weeks. The children were taught to recognize the worst insect pests, to know necessary facts of their life history, and to understand the easiest and best methods of controlling them. Birds were studied as one of nature s checks upon insect life. Their place, value, and service were impressed upon the children. A school garden was planted and some experimental work conducted. In the work in home economics, the teacher turned the study in the direction of some very fundamental needs revealed by her visits to homes. Children and parents, in some cases, were in the habit of sleeping in rooms with all windows tightly closed, or with a lamp turned low. Some of the most common facts of health, beauty, and harmony were disregarded in the homes. Dust catching carpets, cheap lace curtains, ugly wall paper, poor lights, and over-carved furniture were some of the things to be considered. A course was therefore given including the plan, construction, furnishing and decoration of a modern, sanitary, country home. All questions of a house from building materials to curtain materials were discussed. The children were taken to well-constructed city houses and buildings to see illustrations of the principles studied. Furniture stores and dry goods stores were visited and relative qualities of sanitation and decoration as well as of cost were noted. The course was one that showed almost immediate results in changes of conditions for the better in many of the homes of the community. Mothers' meetings have been held, as have also numerous evening meetings for social intercourse, entertainment, and general improvement. A girls' Culture Club, including young women outside the school as well as girls in the school has been formed and has held meetings once each week, continuing these even through the summer vacation last year. Money-making socials have been held.

All lines of activity, through all of the subjects of study and through every other avenue leading to a closer relationship between the school and the homes and lives of the people have been studied and rigorously pursued by the Training Teacher in this school. She has enlisted the help of every one of her thirty to thirty-five ch'ldren and of every patron who could aid in any way. And results are commensurate and worthy of the effort. The new aspect and meaning and value of each of the subjects of study make the work of the children a joy and a real means of growth; the school's influence has changed the lives of the people in matters of dress, of household

decoration, of keeping front yards and back yards, of ventilating rooms, of attendance upon lectures in the neighboring city; of their reading; of their farming; and of their plans for the higher education of their children. This school is literally socializing and spiritualizing the people of the district. Neither material products nor words can begin to express the changes wrought in the attitudes of mind and the spiritual lives of these people. For three years I have watched with the keenest interest these changes as they have gradually developed. Those in the school district scarcely realize how marked the changes are. The casual visitor sees the good school house, the basement, the furnace, the well kept yard. But these are but material devices for the development of the social and spiritual ideals. The really significant work of the country school is in helping the people to learn how to use the *material* inventions and conveniences of our time to aid them in living richer *spiritual* lives. How to make labor saving machinery and rural mail delivery and the farmers' telephone and the abundance of papers, magazines, and books mean deeper richer, more contented and more spiritualized life in the country is the large problem of the country school.

And why have I thus dwelt upon the work of this Training School at such length? Simply because it is a key to the solution of the normal schools' duty toward the country school and the country school teacher. Our students may observe the work of this school in all of its phases. They may also select it for half or more of their practice teaching. They may teach in this school for one hour a day for six or twelve weeks, or one half a day for six or twelve weeks. In this work they learn first hand many of the problems of management, program making, alternation of subjects, adaptation of subjects to neighborhood needs, the practical care of the school room as to light, ventilation, janitor work, etc.; the social work of the school, how to keep from three to five classes all busy profitably while one is reciting, how to squeeze the highest possible value out of every minute of school time, how to make recesses and noons count for most,—in short, in this work they come face to face with the real problems of the country school and learn to solve them with the aid of an expert supervisor when they become too hard to solve in a reasonable length of time unaided.

I have already alluded to our one year class in country school work, those students coming largely from the eighth grade. For them, the country school of observation is of value almost beyond estimate. They are too young, immature, and inexperienced, to comprehend or appreciate many principles in the abstract. They need to be shown concretely the principles in daily practice. We therefore use very extensively for this class the work in the Country Training School.

No practice teaching has been permitted these students up to this time. They visit the school and hold conferences for the discussion of their observations. They go with specific questions—to look for definite things. For most purposes the class is divided into groups of from five to fifteen members, the number varying with the conditions and problems. For many problems, this concrete embodiment of their solution is of far more practical worth than all that these students hear or read about them. As a type of what may be done in transforming an old and dilapidated building and grounds into a comfortable and attractive school home; in organizing classes and making programs well adapted to the best use of time and the most satisfactory progress of all of the pupils of the several grades; in showing the use of sound, well tested pedagogic method in teaching each of the subjects in the country school course of study; in showing how to make the work of the school carry over into the home life of the parents; in demonstrating how mothers' meetings, evening meetings for social entertainment and uplift, and special day programs in the school may be planned and profitably carried out;—in all of these and many other phases of the country school work this Training School can serve a very substantial and valuable source of observation and study for this one year class of students.

Indirectly this school also serves a valuable purpose in stimulating improvement in school buildings, equipment, and work generally. The very fact that the Normal School maintains such a school gives new dignity and significance to the work in the eyes of many. Indirectly it will aid materially in developing consolidation of schools. School boards contemplating new buildings or changes in old ones have visited the school from several different counties. Twenty-eight county superintendents have been to visit the school and study its methods of work, while teachers in considerable numbers and students from various parts of the state and country including the principals of half a dozen normal schools have received suggestions and inspiration from visits to this country school in this typical country community.

Finally, one function of this school, and by no means a negligible one, is that of helping to keep the general professional work of all departments of the Normal School a little nearer the actual needs of elementary school teachers. The work of the country school makes such calls upon all departments that they are constantly reminded of the daily needs of working teachers. This ever present concrete work helps very markedly in keeping the theoretical and the practical in a measurably respectful harmony.

To summarize, then, this country school of observation and practice proves itself highly beneficial in these ways:

1. It serves as a school of observation for all students of whatever

rank who expect to go into country school work, illustrating concretely the good solution of the physical problems of building, grounds, heating, lighting, interior equipment, and decoration, and the social and educational problems of making the school and its work through the course of study and its auxiliary activities the great leading force in community life.

2. It furnishes a school for practice, for those ready for such work, under expert supervision, in the solution of the daily problems of school management and teaching, and intimate acquaintance with the means and measures for making the school reach out into every fundamental interest in the school district.

3. It exerts an influence upon the school ideals and school practice of many schools throughout our territory through the results of visits by working teachers, county superintendents, and school officers.

4. It enables the Normal School to make definite, concrete contributions to country school progress by providing a means for testing and adapting to real conditions such ideas as may be developed by the several departments. And,

5. It helps to keep the work of the various departments closer to the actual problems and every-day needs of the working teacher.

In realizing any and all of these functions, it would seem, therefore, that the country school of observation and practice is an indispensible adjunct of the Normal School. Without such a school, it seems to me that the work of a normal school attempting to prepare teachers for country schools would necessarily be remote from practical needs and perhaps even opposed to these because of its isolation from any means for providing the check of practical application.

The twentieth century country school is to be a school of unprecedented practical efficiency as well as one producing a high order of genuine culture. It can not be so excepting as the principles of the most sane and intelligent psychology and pedagogy find application in equally sane and intelligent practice. The country training school seems to me to be the only logical agency for bringing these two into efficient, co-operative harmony and for providing for some measure of their transmission by observation and participation to prospective country school teachers.

A new departure in the usual program followed Prof. Bonser's paper when three graduates of County Training Schools, Miss Caroline Schumacher, Manitowoc County; Miss Gertrude Walrath, Waupaca County, and Miss Ruby Cone, Sauk County, each presented a paper on "What the Training School Has Done for Me."

There was a very decided unanimity in all of these papers, the graduates showing that they had been very materially helped and guided by the work in the County Training Schools. The speakers

agreed in declaring that they had received training in methods and devices which were practical, professional training which was not mere theory, and ideals of womanhood which included not only high and noble ideals for a teacher but for their whole lives.

The concluding address of the section was delivered by W. E. Larson, State Rural School Inspector, upon "The Need of Country High Schools from a Training School Standpoint." Mr. Larson said that the conditions in Wisconsin are such that the great majority of our country teachers must come from the country and as conditions now stand may begin teaching in the country after a six weeks' training in a summer school or a two years' training in a County Training School.

The two chief criticisms upon the Training Schools, which have come to Mr. Larson's notice, are (1) the students are too young, and (2) are too poorly prepared. The remedy for these faults lies not in the Training School, which can but take the material as it comes and give the best possible training under the circumstances, but in a Country High School. This High School is to be located in the country, to be taught by at least two teachers of more than ordinary breadth of culture and altitude of ideals; the principal to be a man with a good training in manual training and agriculture, and his assistant a woman competent to teach domestic science in all its practical and applicable phases; both to be teachers of broad culture and training in the ordinary branches of school work.

Give the country pupils their high school work in a country high school under such teachers as above indicated and they will not be educated away from the farm but to it and have a wholesome respect and love for agricultural pursuits.

Then take these graduates of country high schools, give them a *two years'* training in a County Training School and send them back to teach in the country schools and they will lift the rural school to the plane where it rightly belongs. These graduates will know the country environment, the prevailing conditions in their own county, the needs of individual communities and be fitted as no other teachers possibly could be, to take up the burden of rural school teaching.

Teachers so trained would prove the falsity of the idea that just anyone after a little brushing up can teach a country school. Rural schools under such teachers would be what they should be the best in the state.

After a brief recess a discussion of some questions left over from the Grand Rapids meeting was taken up, resulting in the appointment, upon motion of a committee of five members, to appear before the legislative committee and endeavor to get favorable action on the new certification bill for training school graduates.

The committee appointed consisted of: H. H. Liebenberg, Alma, Chairman; A. M. Olson, Marinette; W. A. Clark, Eau Claire; C. B. Stanley, New London; O. E. Wells, Wausau.

After this committee was appointed the meeting adjourned.

WINIFRED EDSALL,
Secretary.

REPORT OF PROCEEDINGS OF THE STATE GRADED SCHOOL CONFERENCE.

Juneau Hall, Auditorium Building.

Chairman—J. E. Riordan, Principal State Graded School, Milwaukee.
Secretary—Mattie McMillan, County Superintendent, Mauston.

Thursday Afternoon, Nov. 4, 1909.

The meeting was called to order by the chairman, J. E. Riordan. The paper of Professor M. A. Bussewitz, State Normal, Milwaukee, on "The Teaching of Arithmetic in the Grades," was right to the point. He said in part: "That there is something wrong with the teaching of Arithmetic in the grades is evidenced by the discontent of the business world with the arithmetical ability of the young men and young women entering lines of work requiring some arithmetical skill. The speaker, for a number of years examined annually about two hundred high school graduates for admission to the normal. Each year some 40 per cent were unable to obtain correct results in simple work like the following: 2 divided by .000002; .000002 divided by 2; what is the difference between one third of $1,800.00 and ⅓ per cent of $1,800.00?"

The reasons for the poor showing made are:

1. Arithmetic is begun too early in the child's life. Problems involving a considerable amount of reasoning power are forced upon him before that faculty is sufficiently developed to cope with them. Most of the problems are too complex, unreal, and unrelated to the child's interest and activity.

2. Teachers follow too slavishly text books and courses of study.

As remedies he suggests: "Give no formal instruction in arithmetic in the first two grades. If the time now devoted to arithmetic in these grades were given to a greater mastery of reading, spelling, writing, and the English language, better progress could be made. These subjects are difficult enough for any child, and to force upon him at the same time the arithmetic means swamping the little intellect with difficulties, and results in confusion and failure to master different subjects as well as they should be and as well as they can be by the other method. At the Normal this plan is pursued. At the

end of the third year after only one year's instruction in arithmetic, the children handle the work on the subject with about the same facility that pupils do who have had the subject during the first three years. It is a pleasure to hear them read and they handle the language work with a surprising degree of ease and facility. Furthermore, they have escaped much of the drudgery incident to the other plan, and this is a distinct gain.

No complex and involved problem should be given until the Seventh Grade, when the mind is sufficiently matured to grapple with them. Nine-tenths of all the work in compound denominate numbers should be entirely omitted. What person has occasion to compute the price of 3 yd., 2 ft. and 7 in. of ribbon at 14 cents a yard? The business men and mechanics use only two denominations in any practical problem that they must solve in pursuit of their respective avocations. Why then give children work involving four or five denominations in one problem?

To compel immature intellects to do work like the foregoing and similar work found in text and prescribed by courses of study is a crime against childhood. Under the present system each teacher must administer the dose of arithmetic prescribed by the course for her grade irrespective of the fact whether the class is ready for it or not. Suppose some central authority should demand that each physician should prescribe annually 10 lbs. calomel, 2 lbs. strychnine, etc., irrespective of what the condition of his patients demanded, and that an examination were held at the end of the year to determine whether the regular amount of drugs had been used, and no more or less. What success would such a physician have? Yet we expect teachers to make a success under similar conditions and limitations."

In conclusion, Professor Bussewitz said: "Devote the first two years to the mastery of reading, spelling, writing, and the English language. Drill systematically from the third to the eighth grade inclusive on the four fundamental operations, particularly on columns of numbers of two and three figures each, for the purpose of securing accuracy and rapidity. Give practical problems only—problems whose solution demands reasoning power commensurate with the mental development of the class. Allow principals and teachers to diagnose the difficulties in their schools and then permit them some latitude in applying the appropriate remedies. By doing this we shall make better progress in arithmetic, secure a firmer mastery of other subjects and contribute materially to the happiness of childhood.

Dr. Ralph Elmergreen, Milwaukee, in his paper on "Essentials in Physiology," said: "The title of this paper is somewhat unfortunate. Everything that concerns life is essential and only a daring man would attempt to convince his audience that instruction along certain lines is more essential than instruction along certain other lines.

In order to meet the task assigned to me squarely and unreservedly, I have permitted myself to paraphrase the subject matter assigned me into the interrogatory title, to-wit: "What shall be Taught in Physiology in our Graded Schools?"

Dr. Elmergreen notes that while "our friends, the law-makers," do not concern themselves with what is taught in arithmetic, or in spelling, yet they do concern themselves with what is taught in physiology, especially with reference to alcohol and tobacco, diet, and clothing,—theories and facts.

"The teaching of physiology in our graded schools today is freakish, faddish, desultory, and chaotic." It is like the teaching of Civil War happenings in Southern Schools a few decades ago, or of American History in England about a century ago.

"Physiological chemistry, Physics, Histology, Anatomy, Dietics, Alcohol and tobacco, Comparative physiology, Comparative anatomy, Microscopy, Sanitation, Hygiene, Sexual hygiene and more are included in the study of physiology. Will you please tell me what is and what is not essential of this?" . . . "Would it not be far wiser to cut this study out in toto and teach the child the few facts we really know about food and habits and alcohol as a phase of nature study, I think so."

In speaking of the impossibility of teaching any useful anatomy in the school room, Dr. Elmergreen said: "To my mind the teaching of anatomy is not only useless in our public schools, but absolutely dangerous to our moral elevation when approached in a frivilous, disdainful, superficial attitude. The child's mind toward the human body should be reverential, not analytical."

"To teach the immature in mind and body anatomy at the dissecting table is shocking and revolting and should not be considered at all. We must likewise strike out the study of physiological chemistry, physics, and histology for the reason that these studies can only be successfully undertaken in the laboratory by mature minds."

What shall we teach in dietetics? What is food for one is often poison for another. "The hungry, poorly-clad child is warned against the dangers of overeating." . . . "It is better for a well-fed child to work in a factory than for an ill-fed, hungry child to count his diminutive bones."

"Microsocopy can not be profitably taught in our public schools for lack of proper laboratory facilities and the necessary instruments." It is a concrete subject and would appeal to the child but we must consider that the very suggestion of disease to the young is not unfraught with danger.

"The modern attitude toward the child, asking to keep all thought of sickness away from the young,—to teach them to live naturally,

remain children as long as possible, living as the birds in the air, near to nature, and fairyland, and their Creator, can not be easily brushed away."

"The trouble with our whole educational system today is, that we persistently confound evolution and progression with necessary additions to our courses of study. We are attempting to force the child by a hot-house process into an undersized adult. To my mind the school curriculum is overcrowded and overburdened without the study of physiology, and educational evolution lies in the line of intelligent elimination and emphatic exclusion."

What shall we teach in hygiene and sanitation? "My answer to you is, throw your text books out of the window and teach only such facts as you know." . . . "There are enough proven facts to teach the child and it is wholly unnecessary to wander into the lands of theory or domains of fads to keep the child busy."

Do not lay too much stress on personal cleanliness—hands and clothes—lest such talk bring sorrow and tears to many a good mother unable to look after the niceties of the clothes and cleanliness of the hands in her half dozen of dear ones. An honest black palm got in helping father or mother before school opens is no disgrace and no menace to health. "Teach cleanliness but do not teach Percyism. It is far better to keep the mouth clean of gossip and falsehood than it is to keep the hands clean after innocent play or honest toil."

Few teachers, if any, are qualified to teach the effect of the use of alcohol on the various human tissues as this requires post mortem training and laboratory qualifications, and she should not attempt to impart to her pupils her personal prejudices.

"Tobacco, however, has been conclusively proven to be a poison to the young, and its use should be peremptorily forbidden. The child should be taught, not told, the effect of tobacco on the red corpuscles."

After consulting many practical teachers, educators, and scientists, I am of the opinion that it is better to leave the discussion of sexual matters entirely to the parents, but it should be done in the home, if we want to safeguard our boys and girls and keep them from falling into bad habits and untoward vices through ignorance.

In his paper on "Essentials and Non-Essentials in Teaching Agriculture," Hugo A. Pauly, County Superintendent Schools, Milwaukee, said: "The successful farmer must have a clear insight into agricultural economics. He must be able to calculate whether it is more profitable for him to spray potatoes against blight than to throw away a large part of his crop as unfit for market; whether it be of more money value to destroy the robins that are after a few of his cherries or to let them kill insects for the season. He must realize that a poor

breed of cattle eat as much of his crops as a good breed and give him less returns."

"Cities have grown at the expense of the farms." . . . "The problem of what to do to keep the people on the farm therefore becomes a difficult one." To partly solve this problem the study of the elements of agriculture was introduced into the course of study of the State University. "The objects of the course were, first—to create interest in farm life, thereby keeping the boys and girls on the farm; secondly—to make progressive farmers of them."

The cities have not taken up the move as earnestly as was expected and only a very few cities and some of the smaller towns give to agriculture any consideration. The course is found in the Elementary Courses of the Normals but omitted in the Advanced. It is found in the Training Schools, but in few High Schools. "What provision have we then for the training of teachers who are to be leaders in their communities on this important subject?" . . . "Only the other day a principal of a school, whose duty it had become to teach agriculture, remarked to me, 'I don't know anything about the subject. I must read up on it first.'"

"I doubt whether much enthusiasm for farm life has resulted by reason of the course of agriculture as it is ordinarily taught. A stronger impulse for progress the last few years might rather be attributed to the dissemination of agricultural knowledge through the Farmers' Institutes held all over the state and through the influence of pupils attending agricultural schools, who there see things actually done by demonstration, object, and experiment." A good teacher of agriculture once said to me that his eighth grade class was over at the Farmers' Institute that day as they could learn more of practical agriculture there in two days than he could teach them in a month.

"Vocational and observational as it is, let us utilize those forces which make lasting impressions on the minds of children:

1. Excursions to neighboring farms where certain phases of practical and successful farming may be demonstrated objectively.

2. Farmers' Clubs with their possibilities of drawing upon the experiences of peers in special lines of work in which they are most prosperous, or of learning of the experiences of young men who have been to agricultural school.

3. The School Garden with its vast opportunities to show types of plant life, grafting of fruit trees, effects of tillage, moisture, soil ingredients, and fertilizers on plants.

"Are we instilling in the children of our schools a real love and an appreciation of the beauties, natural wonders, and problems of farm life?" "If there is to be a revival of interest in the country schools,

it will be necessary to prove to the farmers that there is taught in our rural schools something which is of direct value to the boys and girls who are to live upon the farms." . . . "Let us exalt the farm, exalt the rural school, make the school a center of interest and importance to the community and we shall have done much to stay the rush from the farms to the cities."

Thomas R. Lloyd Jones, Superintendent of Schools, Fond du Lac, speaking on "The Marking System," said: "The evils in our present marking system have grown out of our highly developed system of grading. We have perfected our school organization until it has become mechanical. False standards have been erected, low motives appealed to, and in the end we have put a premium upon superficial scholarship, to say nothing of the dishonesty fostered by so arbitrary a scheme of credit giving." . . .

"It is the duty of every teacher to assign work to her class that the brightest as well as the dullest may have all he can do. 'A school is too often a place where pebbles are polished and diamonds are dimmed.' It is right and proper that the pebbles should be given all the polish that they can take, but it is not right to dim the diamonds. We have too long gone upon the system that the brilliant boy would take care of himself. There is not room between 75 and 100 for a normal class at its best, and any system of marking that compels a teacher to go lower, is to allow the brightest pupils to loaf, and is bad in theory and practice. It is a compliment to a teacher's ability when his class, all working, grow apart." . . .

At present the student suffers in standing and peace of mind due to the varying standards of the teachers. A mark of 80 does not mean quite the same thing to any two persons. As a teacner's ideal of scholarship goes up, marks go down. The present system of marking does not recognize this fluctuating standard."

Examinations are important in modern education. They test the pupils for knowledge and power, and thus show him his strength and weakness, while they test the teacher's ability to teach. Most of our examinations are tests of memory rather than reasoning power.

Marking systems are at present essential, but there are too many drawbacks to the methods used and some changes ought to be made.

"In the world of affairs everything is relative." . . . "A good student is above the average of his class, or group; an excellent student has been able to push his head away and above his fellows. So why not take the average per cent of any class in any given subject as our basis for record."

He suggests that the marking system suggested by L. D. Harvey to a small group of high school teachers at Racine several years ago be used. Teachers find it difficult to make the mental adjustment, but

1. C. F. Viebahn, Watertown
2. Leo P. Fox, Chilton
3. Elizabeth M. Herfurth, Madison
4. Frank P. Sadler, Chicago
5. Henry S. Curtis, Worcester, Mass.

thought and study will enable the teacher to make the necessary adjustments. The advantages outweigh the disadvantages. The student will maintain the same relative position with reference to his class whether his teacher marks high or low. "This system makes it possible for the teacher to make of his examinations an educational instrument of real merit. Standards of school work may thus be raised and that is most important."

"A careful study of our methods reveals the fact that high marks and breadth of scholarship do not necessarily go hand in hand. Very frequently the honor student has a routine mind, incapable of taking initiative, always following the narrow tract blazed out by the teacher.

"Let me say that our present marking system holds before the students a low ideal, a cheap incentive, one that cannot be without influence upon all their after life because of joys missed. 'It does not make them better students; it does not cultivate the habit of study; it does not cultivate the love of study.' The system I have suggested, one that has been tried out, is, in my opinion, an improvement, however far it may be from the ideal. . . . When all teachers have thought themselves through, when parents have been trained away from the old methods, we shall be able to have two marks and only two, "Satisfactory" and "Unsatisfactory." This is the custom now in some places; it will, I believe, be the general custom as soon as we prepare the soil. Teachers should be leaders. Let us try to reach the front."

MATTIE MCMILLAN,
Secretary.

COUNTRY SCHOOL SECTION

Chairman—Leo P. Fox, Chilton.
Secretary—Clara A. Purcell, Beaver Dam.

The meeting was called to order at 2 p. m. by the Chairman, L. P. Fox, County Superintendent of Schools, Chilton, who stated that each of the subjects on the program related to country schools, all the participants, with the exception of one, having held the position of county superintendent.

The first paper, "The Enforcement of the Compulsory Education Law," was read by Albert Brunstad, County Superintendent of Chippewa County, and it discussed the enforcement of the Compulsory Education Law in those districts under the supervision of county superintendents of schools, this including all towns, villages and cities not under the supervision of city superintendents.

The provisions of the law are:

"Children between the ages of 7 and 14 years must attend some public, private or parochial school 120 days each year.

"They must be enrolled at school within the first school month and must attend regularly unless legally excused.

"Children between the ages of 14 and 16 years must attend unless lawfully and regularly employed."

A child may be legally excused but there is a penalty for the violation of the law.

Mr. Brunstad spoke emphatically of the enforcement law being placed in the hands of the county superintendents, teachers, district clerks, sheriffs and the district attorney and the co-operation of these forces to effect the necessary steps in securing the required information and in prosecuting delinquent cases.

In order to ascertain results and information as to the enforcement of the law, blanks for reporting on the matter were sent to fifty county superintendents of the state and the difficulties enumerated indicate, without a doubt, that the enforcement of the law is yet a problem, altho these difficulties are not so great as to make the problem overwhelming.

"With the necessary assistance given," said Mr. Brunstad, "so that the county superintendent can do his work as the law seems to impose it, many of the difficulties enumerated would vanish. As the superintendent must be the moving spirit, much depends on him and he is ready and willing to do his duty.

The two important factors in imparting information are the teacher and the district clerk. Their reports besides forming the basis for reports to the truant officers, are important as matters of record.

The sheriff is not the only one who acts as truant officer, as the last legislature imposed the duty of enforcing the Compulsory Law upon the factory inspectors and the Bureau of Labor and Industrial Statistics.

In concluding this much discussed subject, he stated that the Compulsory Education Law can be enforced and that in many instances is being effectually enforced. With the added assistance of the factory inspectors and the Bureau of Labor and Industrial Statistics, a more effective enforcement will no doubt result in the future. What these agencies can do though will depend much upon the ability of the county superintendent to ascertain the truant children and to ascertain these he must have the earnest and reliable co-operation of school officers and teachers.

C. F. Viebahn, Member of Assembly, Watertown, had for his subject, "Some Needs of Our Country Schools," stating that he wished his paper discussed. The whole theme of the paper was a demand for better conditions in the country schools.

At a recent educational convention at Madison, one of the principal speakers, a former governor of Wisconsin, in an address on the relation of the high school to the state university, incidentally referred to the condition of our country schools and pronounced them to be "good for nothing." While this assertion is an exaggeration and perhaps not intended to be taken literally, it must be admitted by anyone somewhat acquainted with the rural schools in different parts of the state, that most of them fail to give to the boys and girls who attend them even a fair elementary school training. Altho much has been done for the betterment of the rural schools, there is still more to be done.

Some of their greatest needs have thus far received too little attention and one of these is a better school sentiment in most communities, a sentiment that is not only friendly to the school, but also appreciates good teaching.

"There are four classes of people that hinder the making of a good school," said Mr. Viebahn. "To one class belong those that care little for the education of their children, and consider any school good enough; to a second class belong those who are in favor of education and of supporting a good school, but who do not appreciate good teaching and often consider a very poor school to be a very good one; to a third class belong those who, while tney vote to maintain a good school, are always finding fault with the teacher if he neglects to bestow special favors upon their children; and to a fourth, not a very large class, belong those who are in favor of education and who can appreciate good school work, but who have the notion that a country school is necessarily a poor and inefficient school."

Another great need of rural schools is more well trained and thoroughly qualified teachers. A high school may furnish the best preparation for college but it is not at all adapted as a course preparatory for teaching in the rural schools. The establishment of County Training Schools was a step in the right direction but their courses are wanting on the academic side. A proper preparation for the rural teacher would be a general English course of four years combined with professional work.

Better supervision is also a great need of the rural schools and, to improve this supervision, he thinks the county superintendent should be appointed by a county board of education, as was provided in a bill that was introduced in the legislature last winter, and that the county superintendent should have as many qualified assistants as are needed to give the rural schools sufficient supervision. The county board of education should also appoint a clerk who can attend to most of the office work which now detains the superintendent so much

from the schools. There should be at least three state elementary school inspectors whose chief duty should be to direct and advise the local inspectors.

"The county superintendent should be the leading conductor of the annual county institute," continued Mr. Viebahn, "and I want to emphasize this fact most emphatically."

This paper was followed by a very animated and interesting discussion by Messrs. Patzer, Wells, Fox, Roberts and Viebahn.

Next on the program was A. A. Thompson, Principal of the Richland Training School, who spoke upon "The Mission of the County Training School." "When this paper was assigned to me," said Mr. Thompson, "I really and truly thought the County Training School had a mission and I do yet, even though present conditions seem to the contrary." In a very clever way he then proceeded to explain the missions of such schools, stating that the County Training School must live and preserve its identity the same as plants and animals. Normal Schools were obliged to fight their way, so the County Training School must do likewise to maintain its existence. The High Schools have lain dormant thus far in helping the country schools.

One of the missions is to train the public in beautifying the school grounds and he suggested that this be accomplished by means of a campaign. The buildings should be improved when necessary and kept in good condition. The attendance at the annual school meeting should be investigated to determine whether or not the right people are controlling same.

The next body to educate is the school board. Here ne mentioned two important facts regarding the hiring of teachers: first, to hire a teacher early, and second, not to hire a teacher until she is seen.

Another mission of the County Training School is to inspire teachers by visits, letters, columns in the papers, etc.,—the training school conductors being a class of inspectors.

Still another important mission is to train the country school teachers. Mr. Thompson was very enthusiastic regarding this, saying that there must be a place where teachers are trained to be professional and where great stress is given to thoroughness in subject matter, as many have not had these subjects for years and a teacher must learn these things first. All this may be accomplished at the County Training School under the careful supervision of the faculty.

"What Can the Normal Schools Do For the Country Schools?" "To answer that question briefly," said C. E. Patzer, Supervisor of Practice, Milwaukee Normal School, "I should say do what Mr. Thompson says regarding the County Training School. He has exhausted my subject as some have exhausted his." He said that, in speaking of the County Training School, Mr. Thompson had outlined the duty of

the Normal School, as there are still children teaching children and the great demand is for more mature men and women but was unable to suggest a way to prevent this. Mr. Patzer was glad the teaching of fundamental subjects had been emphasized because, "We cannot teach what we do not know." Above all, the Normal School preparing the teachers, must be thorough in the fundamentals. "I would emphasize the teaching of English," said he, "because many are deficient in English and no school that I know of demands the highest kind of qualifications for teaching as does the country school."

No person can join the normal students' class expecting to teach a country school and the Normal School must do for the teachers just what the Country Training School is doing. However, there is a possibility of this difficulty being overcome to some extent, if there were in connection with every Normal School that trains the country teachers an ungraded school so that they may be brought in contact with the reality of same.

There is a difference of opinion as to the purpose of the rural schools but the general purpose is to help the children to fit their places.

Being desirous of seeing the country schools consolidated and the normal teachers more fitted to teach these schools, one of the concluding remarks was that these problems should be discussed by educational men.

A very inspiring and helpful talk on "The Preparation of the Teacher" was given by Mattie McMillan, County Superintendent of Juneau County, and the following from her introduction of the subject is worthy of repetition:

"This subject, the preparation of the teacher, is a broad one and presents many phases, any one of which would be worthy our attention, and all of which are of special interest to those who are concerned in trying to solve the educational problems of the present day.

Much is being said at the present time about the preparation of the rural school teacher from an academic and professional standpoint, and this is well, for the future will demand better prepared and better trained teachers. It is our business to be ready to meet the demand.

But there is still another sort of preparation, without which no teacher will ever be truly successful and the lack of which is causing more failures among teachers than any other one thing. This is the preparation for one's daily work in the school room.' "I wish to repeat," said Miss McMillan, "that more teachers are failures today in the rural schools, and in graded schools, and in high schools, and in normal schools, and in colleges because they fail to make preparation for their daily work than from any other cause." Adequate preparation for the daily work may be classified as follows:

a. The preparation of the room.

b. The preparation of the seat work.

c. The preparation of the daily lesson.

Another specific and important preparation which she mentioned was the preparation on the part of the teacher for teaching the pupils to read and to love the beautiful things written by the masters of literature. Her illustrations of the helpfulness of this vital preparation were both beautiful and practical.

In closing she said:

"Give to your students the key which will unlock the door into this mine of rare treasure.

"There is a substantial equipment for the struggle of life in the divine thoughts carried as a song in the heart. They are truly a fountain of strength in the crises of doubt and temptation and sorrow. It is no small thing to give to the young an equipment of that sort."

O. J. Schuster, Institute Conductor of the Platteville Normal School, read a paper on "The Importance of Habit Formation," which was the product of much careful thought and consideration.

Habit formation holds a very prominent place in the development of the race and could this only be realized many habits of pupils would be corrected. He quotes from the greatest of living American psychologists: "All our life, so far as it has definite form, is but a mass of habits—practical, emotional, and intellectual—systematically organized for our weal or woe, and bearing us irresistibly toward our destiny. Ninety-nine hundredths, possibly nine hundred ninety-nine thousandths of our activity is purely automatic and habitual, from our rising in the morning to our lying down each night."

The cultivation of the habit of using good English is often neglected, thus depriving the child of the ability to speak correctly and increase his vocabulary. Neither do we find the habits of thought any better in some phases of school work. The habit of dealing with vague and partly formed conceptions gives rise to language that is equally vague and ill-formed and this language in turn reacts powerfully upon our mental processes. The outward manifestation of slovenly and careless habits of thinking is a slovenly and careless expression.

The mind of the pupil has become accustomed to accept whatever is written or spoken by those in authority, no matter how deficient in intellect this authority may be.

Before seeking a remedy for these evils, we must endeavor to understand the difficulties involved in habit formation. In the education of the child the first steps require the greatest professional skill, such skill being recognized in theory but not in practice. "When what we do harmonizes with what we believe," said Mr. Schuster, "the most

thoro professional training will be possessed by the teachers of kindergarten and primary grades."

The need of such professional training for teachers of the elementary grades is keenly felt by skilled superintendents as they see many children handicapped for life through the formation of bad habits during the first years of school. Human nature must be aided to realize its possibilities through the formation of habits in the period of childhood. To leave the formation of the habits of thought and expression of our children to unskilled hands is destructive of the very purpose of universal education.

He spoke enthusiastically of the need of leaders to overcome this difficulty, "Captains of Industry" in the business of education and, although great difficulties and dangers do beset the educational leaders of today, these very conditions call appealingly for the Captain and the heroic nature responds joyfully.

CLARA A. PURCELL,
Secretary.

SPECIAL EDUCATION SECTION.

Chairman—A. J. Winne, Inspector of Schools for the Deaf in Wisconsin.

Secretary—Mary L. Funk, Milwaukee.

Treasurer—M. Hume, Racine.

The Council Chamber, City Hall, was well-filled, when the meeting was called to order by the chairman, Mr. Winne.

The first number on the program was an exercise in rhythm by deaf pupils from the Milwaukee School for the Deaf conducted by Miss Clara Kranzusch.

Prof. Louis C. Sears, Supervisor Manual Training, South Division High School, Milwaukee, followed with a paper on "Manual Training for the Deaf."

He said in part: "Manual training exercises are cultural the same as intellectual exercises. By a combination of hand and head work the pupil should be able to find and exercise his best powers while obtaining accurate information in many practical matters."

"We teachers of the High Schools find no trouble teaching the deaf students. They have in a measure certain advantages over the hearing student. They are better able to apply themselves because they are not disturbed by their surroundings. Then, too, because the sense of hearing is lost they are compelled to make better use of their eyes and hence the optic nerve is better and more accurately trained."

Miss Levy, Principal Day School for the Blind, Milwaukee, followed

with a class exercise with blind children. The class consisted of six pupils doing 5th and 6th grade work. They read from readers printed in Braille, wrote sentences which were given by different ones in the audience, on the Braille writers and did number work on the number slates.

Miss Levy says her blind children play with the seeing children and enjoy the giant stride, baseball, climbing the poles, etc., as much as they.

Miss Matilda Flatley, Principal School for the Deaf, Madison, presented a deaf boy of nine years who had been in school but nine months. His speech was especially good.

Miss Katharine Reed, Principal School for the Deaf, Marinette, read a paper on "Language Teaching for the Deaf." She urged the idea of originality and variety in language teaching.

Discussion of Miss Reed's paper followed, by Miss Jennie C. Smith, Principal School for the Deaf, Eau Claire.

"The Wisconsin Home for the Feeble-Minded" was the subject of a paper written by Supt. Alfred W. Wilmarth. It was read by Miss Woolston owing to Mr. Wilmarth's inability to attend the meeting.

After giving a very good description of the School and its uses he proceeded to say that a false idea of the capability of the feeble-minded for improvement exists with many and that their residence in the Home should be permanent. He showed the physical causes for feeble-mindedness. "Inflammation may attack the nourishing mother membrane and completely prevent the flow of blood thru the little vessels which feed certain areas, so that the nerve cells in these areas lose their activity and waste away." "A vessel may be ruptured in the brain substance and produce the same result." There is still another class, the class who suffer from the powerful influence of heredity.

"A person to be regarded as normal must not only be sufficiently useful in society to gain a comfortable maintenance but he must be able to appreciate the rights of others, and develop sufficient self control over his instincts and emotions to acquire the necessities of life without encroaching on the recognized rights of others."

"Then we have the class called Moral Imbeciles. This class is often physically robust, possessed of much animal cunning; may be quite apt at manual work, and more or less closely approach a normal intellect. They are often the offspring of degenerate ancestry who have strengthened their animal characteristics by long indulgence and weakened their wills by constant dissipation. Their offsprings enter the struggle for life like weak rowers in a strong current, with no alternative but to drift, understanding the correct course, but constantly giving way to self indulgence. Gratifying their instinct for acquisi-

tion, lying without conscience, occasionally unnaturally cruel, they include that class of degenerates whose unnatural crimes frequently stir public opinion to its depths.

All of the subnormal should be subjects of parental care. The public should be protected from their ravages, and they should have the harmful things of life put beyond their reach. They are the blameless, but harmful products of a lax, social system, not subjects for punishment, but for sequestration where their evil instincts can do the least harm and they can have the broadest life consistent with public safety.

This is a race whose career must be a dependent one; who find the broadest usefulness and comfort in a community of their equals, and who should be prevented from founding new families of their own kind."

Neither Superintendent Tobey of Wausau, who was to have read a paper on "The Duty of the City to its Sub-Normal Children," nor Hon. S. Wesselius, Grand Rapids, Mich., who was to have spoken on "Home Life While Educating the Deaf," could be present at the meeting.

The last on the program was a short talk by Hon. R. C. Spencer, Milwaukee. He spoke of the origin of the public day schools for the deaf and spoke with considerable feeling of the late Mr. Bernard Stern, philanthropist and benefactor of the deaf.

At the close of the program Mr. A. J. Winne was re elected chairman of the Section for the ensuing year.

MARY L. FUNK,
Secretary.

THE STATE'S DUTY TO THE DEFECTIVE CHILD.

HON. S. WESSELIUS.

The subject of this paper is now claiming the attention of the national and state governments in response to the demand for affimative relief from leading educators and educational associations, national, state and local. The work is being extended beyond the confines of the circle including the education of the deaf and blind and the agitation is now directed to include all defectives.

The work for the deaf in the state of Wisconsin as brought about by the State Phonological Society, under the direction of Mr. Robert C. Spencer, has been the model for the education of this class of defectives in ten or twelve of the other states of the union. So wisely has your state modeled its legislation upon this subject and so carefully have you matured this legislation to complete results, and so diligently have your plans been followed in other states, that it can be

safely said that the restoration of the deaf to society through the day schools and the oral method, is not far distant. By this I do not mean that the noble army of teachers of the deaf will not continue to strive for greater perfection and results and that the methods used will not continue to be the subject of measurement and re-measurement, but rather that the state, having been shown the way to restore this class of defectives to society and to good citizenship, will not turn back but will rather enlarge this sphere of its usefulness. Until the state charged itself with the work for the deaf, within the last century, in many of the states, the deaf were herded with the insane or the feeble-minded.

Progress in their education was confined to private philanthropy which, owing to the difficulties to be surmounted, was limited in extent. When the work was finally undertaken by the state, the state institutions and the sign methods were employed in discharging the state's duty and this defective class, removed from the home and from society for a long period of years, and resulted in the sign-taught deaf constituting an isolated class in the community in which they lived and to a very limited extent normal members of society.

These conditions have been changed by the Wisconsin plan. The deaf child, educated in the day schools for the deaf, escapes the mental and social ostracism of the institution; is reared among the sorrows and pleasures of home; thinks and acts in the vocabulary of the hearing and ranks in social and business attainments with the hearing brother and the quality of his citizenship is not questioned to any greater degree than that of the hearing brother.

I refer to these matters in support of the proposition that the work among other defectives, having for its object the production of normal members of society and good citizens, must not be left to private philanthropy, but must be executed by the state along the same lines and founded upon the same principles of action as those executed in the education of the deaf.

The first question to be solved, if possible, in approaching this subject, is the extent of the state's task and necessarily the gathering of statistics by which the same can be measured. Here, too, the work done for the deaf by the Volta Bureau, in gathering statistics, may be safely followed. Although the United States Census Bureau has gathered some statistics relative to the number of defectives, the result of its investigation has not been productive of the definite information required.

Recently, under the auspices of the Russell Sage fund, an expert examination and partial analysis of the progress made by grade pupils in fifty-five American cities, has been published. Those interested in educational work, have been somewhat startled by these statistics:

Total number of pupils in 55 schools is reported as	1,907,000
Total number repeating grade work in 1907–1908	312,500
15% repeating grade work one or more times	
Total cost of education	88,966,717
Cost of educating those failing to pass grades	13,719,000

In these cities the state has freely expended its money and its energy in the discharge of its duty to mature the child to good citizenship. Measured by the rules applied to a private business of like magnitude, however, the percentage of loss is unreasonable and points to the existence of one or more fundamental causes not now receiving, but needing detailed attention. The results in these cities coupled with the statistics from other sources suggests the subject of this paper.

That fifteen per cent fail to pass their grade at the first attempt may be due to causes not inherent in the child, but that four and one half per cent should fail to pass their grade again and again and finally drop out entirely with third and fourth grade work but poorly finished, points to a cause hidden from the present method of admitting pupils into and passing them through the grades but discoverable by new methods and new tests not now standard.

Statistics reporting the causes in detail of the high percentage of failure to pass grades are meagre indeed, but few cities or districts maintaining a record of the number repeating grades one or more times. Those existing show widely varying causes, uniformity of cause being found only where there is a uniformity of social and domestic environment. Those at hand are interesting. In a small New Jersey city 12.8 per cent are three years behind grade and 4.7 per cent are four or more years behind grade and of these more than one half dropped out of school at the end of the fourth grade to take up the duties of citizenship "scarcely half made up." 2000 of the children behind in grade work are exceptional children mentally or physically and all need, more or less, special treatment to make them normal. Statistics taken from the Chicago schools disclosed 32% of grade pupils as having defective eyesight and New York reports 30% of the grade children as having "gross defects of vision."

If the entire number included in the 15% that failed to pass grades were defectives, mentally or physically, or both, these statistics would indeed be startling, and the state would be confronted with a problem requiring immediate attention of the general government. Fortunately the pupils embraced in the 15% who failed to pass grades, are not all laggards, and only a small percentage of them are physically defective to a greater extent than those that pass grades readily.

The results of the examination of 219 children of both sexes, from six to twelve years of age, in one school in Philadelphia, were published in the Psychological Clinic in January, 1908. The comparative standing in studies of these 219 children, normal and defective, was as follows:

	Average percentage attained
Normal children	75
Average children	74
General defectives	72.6
Children having adenoids and enlarged tonsils	75

In another investigation of the children in five schools reported in a recent work, entitled "Laggards in our Schools," the children were divided into so-called "exempt" children, or those whose work entitled them to pass to a higher grade without examination, and "non-exempt" children, or those whose work was less satisfactory. These statistics should be of great value to those who have gathered their opinions as to the effect of mental and physical defects upon school progress from the general discussions of the subject in the past.

In these schools the number examined was 1594 and of this number 907 were "exempt." Of the "exempt" 28–8/10% were defective; of the "non-exempt" 38–1/10% were defective. Practically the same percentage was found in the examination of 5,005 children in the Philadelphia schools. From these statistics it appears that the number of children defective is nearly as great among those that are bright as among those that are dull.

The brighter pupils seem to be afflicted in about the same manner as their duller companions and I have not been able to discover any statistics in tabulated form and official, covering that class of children who, by reason of mental or physical defects, have never attended school.

An unofficial investigation in a city of 100,000 contained forty of above mentioned class. Of this number all were mentally defective to a greater or less extent and more than one half carried physical defects, which made their attendance at school with normal children, difficult. The same city contains about forty children of school age that are deaf. There are, no doubt, many more physical and mental defectives attending the public schools, who are defective to such an extent that their education cannot proceed in the grades by standard methods, to the point of success.

A cursory examination in this city of 100,000 inhabitants shows the existence of more than one hundred such children, including those that do not attend school at all.

It is safe to say for the purpose of this article that a number of defectives need the special care and training of the state to the same extent as that accorded the deaf, constituting two and one half times the number of deaf. This number will vary greatly, no doubt, in different communities.

The environment of the crowded tenement house and the flat, with the hard paved street as a playground, coupled with a large percentage of foreign born children in the larger cities, will, no doubt, develop a much larger percentage than can be found in communities where these causes are absent.

The rapid current of American life casts up its mentally, physically and morally deficient victims, however, everywhere and these should become the especial care of the state. While it is demonstrated by statistics that it is the tendency of Nature to heal every wound and supply added vigor to the affected parts, and to carry to useful citizenship many of the mentally and physically defective children found in the schools, yet this last class referred to should become the subject of the state's concern to the same extent as the deaf and the blind.

The English problem of how to eliminate the "Hooligans" does not yet confront us seriously, but intelligent and systematic action along well defined lines covering the whole country and through the common schools, is necessary to prevent a degenerate class, the individual of which has been aptly described as too heavy for light work and too light for heavy work.

It is time that the defective child was treated as a unit by other than standard methods and subjected to a scientific inquiry both from the physiologist's and the pathologist's point of view. These experts should be employed by the state and sent to all communities to conduct the examinations necessary to inform the local school boards of the exact condition of every pupil delinquent and backward in grade work.

Delinquent mental or physical defectives should be separated from the normal children for a sufficient length of time to bring them back to a normal condition if possible. It is needless to say that incurables should be segregated permanently and perhaps in the state institutions for the feeble-minded. The employment of trained experts constantly for this purpose may be advisable and can only be determined when the extent of the work to be undertaken is known. One or more trained nurses or teachers should be placed in training under those experts with a view to determining the most patent defects of the exceptional child covering eyesight, hearing, visual and aural fractions, school indications of defective eyesight, hearing or other sense development;

Indications of adenoids, enlarged tonsils, condition of teeth, spinal curvature, chest development;

Reaction of time and strength, imagery and memory;

The physiological machinery of the pupil and the way he does his work and especially the extent of his power of muscular direction;

Signs of degeneration, physical, mental or moral.

With but little training ordinary grade teachers, aided by existing implements and appliances, some of them common to the medical practitioner everywhere, are able to detect and in many cases to determine the full extent of defective vision, heart action, adenoid growths, muscular control, extent of hearing, lung trouble, and without the aid of these appliances and the medical profession, she has been able to determine mental defects, such as lack of memory, lack of will power and moral degeneracy resulting from bad home or social environment. The state law governing this work should be compulsory and made a part of the general educational schemes of the state and its faithful execution demanded from local boards of education and school districts.

After the gathering of accurate data and with these in full view the state's course of procedure can be clearly defined. The history of educating the deaf in day schools may be properly used as a wise teacher and a certain prophet of the results obtainable. Fortunately this history has out-lived the experimental stages in the states of Wisconsin, Michigan and Illinois. The problem of obtaining trained teachers has been solved by the establishment of competent training schools for teachers of the deaf and while the demand yet exceeds the supply, this will be overcome by efforts now being put forth. The establishment of a successful system for the education of the deaf and the restoration of the deaf to society through the medium of the day schools, was not spasmodic but required patient and well organized work. The mere passage of a law establishing them does not in itself secure the opening of schools. Wherever the system has been established, the state has recognized its value and its growth has been continuous.

The tendency to provide state institutions for all manner of delinquent children should be discouraged by friends of this movement rather than encouraged by it. The poverty and utter incompetency of the parent should be the sole rule for admitting children to state institutions. Incurables must of course be segregated in the homes for the feeble-minded and the asylums for the insane. The institution habit involving as it does a tendency to lean upon charity, is upon closer analysis in itself a form of delinquency. The work of relieving the exceptional child should at once be relieved of the false theory that it is the first duty of the state to relieve the normal child of his presence. So jealous have been the friends of the deaf of the child's

right to remain at home that the several states have been prevailed upon to contribute a per capita amount for the education of each child, thus lightening the burden of the school district and removing the final excuse for the refusal to establish schools for the unfortunate.

The sum appropriated is something less than half the amount expended per capita for the education of the same child in the state institution and is ample in amount. It may be found necessary for the state to extend local aid in the carrying on of this work but this is hardly probable in view of the large number of children requiring special training in all communities.

There is another way to inaugurate this work than to leave it to private philanthropy, although this should still be encouraged everywhere. A simpler and more direct and less expensive way in the end will be for this work to be taken up by the several state organizations of teachers or superintendents in conjunction with the Superintendent of Public Instruction, or other state officers charged with the control of educational matters. And to this end, the State Department of Public Instruction should procure:

1. Such statistics as may be at hand demonstrating the necessity for the application of other than standard methods to the regeneration and education of exceptional children.

2. Information of the nature and character of the mental and physical conditions most common among delinquents.

3. Exact knowledge of the number and character of exceptional children in the State.

4. Remedial legislation and state aid in the gathering of statistics; the employment of expert physiologists and pathologists and the special training of teachers to carry on the work within the common schools.

The time is opportune for action. There is now a widespread interest. The subject is being considered by a national commission appointed by Ex-president Roosevelt but without authority to proceed under any law. Literary societies, sociological societies, labor organizations and educational associations are discussing the question, all of which is to be applauded and yet the problem finally must be solved through the machinery of the common schools of the country. All unorganized efforts, as was the case with the deaf, are temporary or spasmodic and local but there is a more certain way and that is to have leading educators urge the legislatures in the several states to the passage of adequate laws.

They will meet with success if the case of the exceptional child is well presented.

There is no tendency in American legislation to deny equality of opportunity in the pursuit of happiness alike to the unfortunate and the fortunate.

MANUAL TRAINING SECTION.

Officers: Chairman—Newton Van Dalsem, Director of Manual Training, Neenah.
Secretary—Louis F. Olson, Director of Manual Training, Madison.

A PROPOSED COURSE OF STUDY IN THE PRIMARY GRADES.

Miss Alyda Clark, Supervisor of Manual Training, Sturgeon Bay, Wis.

The work of the first grade may consist of clay modelling, free paper tearing and cutting, paper cutting and folding, an easy form of card board construction and raffia work.

According to psychological principles, clay modeling should be presented first. The time allotted for this work is three half-hour periods per week for twelve weeks.

This division is to include modeling from object, from memory and from imagination, objects such as fruits, vegetables, and household utensils, a few pieces of simple pottery from model and some without.

I. Objects based on type forms,—sphere, cube, etc.

II. Pottery: 1. Bowl, 2. Cup and saucers, 3. Original piece.

Paper work—Time allowed, sixteen weeks.

To include free hand tearing and cutting from pose, from memory and imagination, illustrating familiar stories; and paper cutting and folding. This work is a preparation for the cardboard construction, which in turn is a foundation for the wood work to be taken up in the fifth grade. Many of the problems of card board construction involve principles of woodwork, thus preparing for that work. This work should be given a place in the curriculum. It can be carried out without an expensive equipment, which is an important factor in some communities. It gives good training to hand and eye; calls for original constructive thought, and it gives pupils an acquaintance with rule, its use, and with working drawings.

In commencing the free cutting, have several familiar, simple objects cut, to get the pupils used to cutting, and getting them to *doing* something. In many cases the pose work is too difficult, and the pupils get discouraged because it looks hard. Things suitable for this start are the ones mentioned for tearing,

a. Simple toys.

b. Household objects to illustrate home industries.

c. Simplest and most common garden implements.

Pose work and illustrations.

a. Child or pet animal.

b. Illustration of games or occupations, as

1. Jumping rope.
2. Sliding down hill.
3. Occupation common to locality.

c. Illustration of stories as, 1. "Crow and Fox," 2. "Stork and Fox," 3. "Jack and Jill.

Cutting and folding—beginning use of rules—using whole inches; to involve measuring and cutting straight lines.

1. Picture mount.
2. Pin wheel.
3. Calendar back—mounting picture and pad.
4. Booklet for cutting—with simple cover.
5. Fan.
6. Book mark—can be decorated with picture.
7. Cubical box.
8. Coal wagon and chute.
9. Square tray—tie corners.
10. Oblong tray—paste corners.
11. Original model.

Raffia and weaving.

Time—eight weeks.

The least time is given to this phase of work. The child's hands when in first grade are not developed enough to do the close work that is required for most of the weaving. Another reason, the continued repetition causes children to lose interest; then it is a mere drudgery, causing carelessness and doing away with the results obtained in the other lines of work. A little of it is enough. The chief use being made of the raffia is to be wrapping and a little braiding.

1. Wrapping.
   a. Napkin ring—may have braided strand put near edges.
   b. Picture frame.
   c. Needle book—two disks wrapped and hinged together.
2. Weaving.
   a. Small mat made of raffia—in plain colors of yarn.
3. Raffia doll.

Second Grade.

The work of the second grade is based upon that of the first grade; tho made a few degrees more difficult.

Clay modeling—Time:—three half hour periods per week for twelve weeks.

1. Models from object.
2. From memory.
3. From pose or picture.
4. Plaques—for flower pots and teapots.
5. Pottery—from model and memory.

Free paper cutting.

Time—six weeks.

1. Work from model.
2. From memory.
3. From imagination.

Card board construction.

Time—ten weeks.

1. Picture frame with opening.
2. Bookmark—for corner of leaves.
3. Book with heavy covers for cuttings.
4. Calendar with hanger and standard.
5. Folders for special days.
6. Trays—using ½ inch edge and modified with straight or curved decorative edges.
7. Units of design—based on plane figures—in borders.
8. Lamp shade.
9. Match safe and scratcher.
10. Envelope.
11. Box with flaps for pasting.
12. Pieces of furniture.
    a. Little chair.
    b. Table, etc.

    As many of these as time will allow.
13. Original model.

Raffia work.

Time—eight weeks.

A. Basketry.
    1. Circular basket made of braided strands of raffia.
    2. Circular mat—using simple basket stitch over heavy chord.

B. Weaving.
    1. Mat—6x9 inches, with two colors—border.
    2. Mat—with center design—extra.

Third Grade.

Clay Modeling.

Time—three forty-minute periods per week for ten weeks.

1. Pottery.
    a. Plain jardiniere.

b. Piece of pottery—decorated with simple design.
c. Vase—simple form.
d. Original piece or something of child's own choice.

2. Common objects from model and from memory.
a. Fruits.
b. Vegetables.
c. Toys—1, little house; 2, bank; 3, top.
d. Animals.
1. Squirrel, dog, cow, horse.
2. Parade makes an interesting problem for memory work.
e. Study of pose.
1. Child.

3. Plaques.

This phase of work is based on what has been given before in first two grades; but is to include more of the type forms. The decorations, if any, to be kept in simple relief or incision.

Free-paper cutting.

Time—six weeks.

Work of free cutting to be used principally in illustrating stories pertaining to travel and fables, Esquimeaux stories, illustrating huts, clothes, means of travel, animals, icebergs, and other races of people that are read about in the grades.

Games of the season, as,
a. Boys playing horse
b. Girls playing with dolls.
c. Playing marbles.
d. Games of other lands.

Construction work.

Time—twelve weeks.

The work in this grade to involve one-fourth inch measurements.
a. Windmill.
b. Mission clock.
c. Book cover protector.
d. Modifications of plane figures used as units in borders.
1. Square. 2. Circle. 3. Ellipse. 4. Oval.
e. Same used in surface design.
f. For special occasions.
1. October—Colored Jack-o-lanterns, caps.
2. December—Calendar, with opening for picture; folder.
3. Easter—Coop containing hen and chicks.
g. Picture frame—cardboard covered with cover paper, with opening for picture.
h. Match safe—with triangular box.

i. Triangular tray.
j. Hexagonal tray.
k. Box with reinforced corners.
l. Letter box.
m. Original model.

Basketry and Weaving.

Time—eight weeks.

Basketry.

1. Small basket of raffia in two colors.
2. Small mat of reeds.
3. Knotted bag.

Weaving.

1. Mat—9x12 inches of chenille. (Tylo strands are suitable for a mat of this size.)
2. Mat—with all-over design.

1. Mat—12x15 inches—Tylo strands for woof and colored cord for warp.
2. Mat—of chenille.

A PROPOSED COURSE OF STUDY IN THE INTERMEDIATE AND GRAMMAR GRADES.

George G. Price, Director of Manual Training, Wausau, Wisconsin.

The first and foremost aim of manual training, in my mind, is to teach the coördination of mind and hand. By this I mean that the hand should do as the mind wills and the eyes guide. This, then, cannot mean the sawing of a board aimlessly. In too many shops the minds do not think, the boys do the work having no clear and definite ideas of what they want to make. A boy wants to make a squirrel cage and this is the limit of his definiteness. If here he be let go, he will begin on one side and gradually work toward the other side, no plan being carried out and not until completed is there anything definite about the cage and not then perhaps. This kind of work is not training but manual debauchery. Before a boy begins to work, he should have in mind clearly what to do, how to do it, and then bring the hands to saw to dimension, and gauge lines as the mind directs. Before commencing an original piece of work, the pupil should make a drawing of it, and know how each part is to fit together. This is not play but work and brings into play those mind faculties of observation, judgment, and reasoning, and their co-ordination with directed muscular activities which means education for the pupil.

Another aim of manual training is to teach correct habits of working. Manual training more than any other subject consists in habit forming. Pupils should be shown the right method of using each tool, and the right methods of working, and then the teacher's business becomes one of seeing that each pupil always does it the right way, until the habit is firmly established. The teacher should not take it for granted that a pupil is performing an activity right, if it has been shown in a demonstration. I have never seen a whole class yet, that could and would do things right after having been shown once. They must be shown again and compelled, if necessary, to do things right.

Another aim of manual training should be the appreciation of good design, thru insisting that everything made be of good design. Pupils cannot understand the principles of good design, but the teacher can see that all things made be of good design.

A fifth aim of manual training in the grades is to teach methods of work which are recognized as standard by the trades. Few trades have lent themselves to being done by grade pupils, but I firmly believe that some can be and will be given in the grades in the future.

The scope of manual training in the fifth, sixth, seventh and eighth grades might include knife work, bench work, mechanical drawing, pottery and elements of concrete construction and bricklaying.

In the fifth grade, I should give a short course in knife work. This is the tool that all boys are most familiar with, and ought to be a stepping stone to the use of the other tools. There are so many uses the knife can be put to, that it ought to receive due attention. In the knife work, I should have all the wood reduced to the thickness, and sometimes to width. It is difficult to get a good surface on a piece of considerable size. Processes which ought to be taught are, cutting to line, inside straight and curved cut on side grain, inside straight and curved cut on end grain, outside straight and curved cuts, reducing stock to cylindrical forms. Models to bring in these cuts are the fish line winder, cord winder, match scratcher, pen holder, and hatchet handle.

By the close of the fifth year, the pupils should know the name of parts, purposes of each, and use of the back say, try square, block plane, chisel, marking gauge, coping saw, compasses, hammer, sloyd knife, brace and bit. They should have done the following processes: steps in reducing stock, squaring for length, lengthwise cut with plane, crosswise cut with plane, diagonal cut, concave cut, curve cut, lap jointing, boring, nailing, glueing, sandpapering. Models based on the child's interests to bring out these processes, are fish line winder,

match scratcher, shelf, cord winder, waterwheel, pencil sharpener, sled and wagon.

In the sixth grade, for the first half year, I should continue with thin wood construction, reserving the use of the jack plane in getting a plane surface and reducing to thickness until the second half year. In addition to the processes of the preceding year, the following should be introduced: plane a surface, reducing to thickness, beveling, designing, filing, rabbiting, and butt-jointing. Models for this grade would be tooth brush holder, postcard box, picture frame, flower pot stand, handkerchief box, bread board, bill file, coat hanger, and foot stool.

In the seventh grade, I should introduce the use of the knife line in jointing stock, and teach the new processes of making gains, rounding large surfaces, rounding long pieces, spoke shaving, doweling, bolting, scraping and finishing. Models for this grade are sand paper block, sleeve board, blotter pad, magazine opener, book stall, and piece of original work in way of taboret, table, or book case.

In the eighth grade, the work should include the making of mortise and tenon joints, house joints, butt doweled joint, doweled mortise and tenon, long tapering, and gauging. Models for this grade would be a taboret bringing in the joints above, pen tray, drawer pull, paddle. The work should be largely original, and should include the designing of a piece of furniture, making a mechanical drawing to scale, figuring up lumber, ordering, and then making the piece of furniture and finishing it. The knife line should be used instead of pencil, and a goodly degree of accuracy should be expected. The pupils will usually live up to all the teacher expects.

Every course of study should be a growing one. It should be organized to fit the child and not the child for the course. Whenever a piece of work is not doing anything for the boys in way of interest, training of mind and character, it should be dropped, and another more suitable one introduced.

What we need in manual training in this state is a more definite idea of what manual training is, what its purposes are, and what must be done to accomplish those purposes. These purposes may vary as to industrial aspects in different localities, but the large purposes are common, the courses thruout the state should be made more uniform, allowing for such individuality as any course in the curriculum allows.

A PROPOSED COURSE OF MANUAL TRAINING IN HIGH SCHOOL

Louis F. Olson, Director of Manual Training, Madison, Wisconsin.

Instructors and promoters of manual training in general are likely to take the attitude that putting a boy at a task with tools is necessarially beneficial. This idea has probably been the cause of much of the inefficiency of our manual training work. The manual training shop holds no magical influence—the equipment will not properly train the boy unless properly used. It merely affords an opportunity for either good or bad training—and laziness, carelessness, inaccuracy, lack of system, and general inefficiency may be developed just as surely as the opposite habits. Men employing manual training graduates make a common criticism that they can *not* do things. They dawdle, they putter, and they figure, but they do not turn out the job. College instructors in charge of manual training graduates say they are not well grounded in the fundamentals of their manual training subjects. School men complain that shop work breaks up the school discipline and makes pupils less responsible. If there is even a grain of truth in these criticisms, it is a blow that strikes directly at the heart of the subject. The basis of all manual work is the idea of learning to do by doing. If there is any looseness, lack of system, inefficiency, or vagueness of requirement in the administration of the course, these features are bound to be reflected in the work of the pupils. In order to merit a place in the high school curriculum manual training must have some very definite aim and the aim must be followed up by some system of utilizing every moment of the pupil's time in class toward the most direct realization of that aim. The greatest value of the work lies not in the mere acquisition of skill in handling tools, but in the building up of certain habits that make for efficiency and manliness. Despite this fact we must not forget that the acquisition of skill and knowledge must always be the means by which the ultimate aim is realized. We can no more develop habits of industry, neatness, accuracy and systematic methods of attacking problems thru the doing of indifferent, inaccurate, inefficient work than we can develop the habit of honesty thru a course in the art of stealing.

Regarding the question of fitting for industry vs. fitting for college which is being discussed quite widely at present, it would seem that both ends might well be attained through the same course. According to the well known and widely quoted Report of the Douglas Commission of Massachusetts, "in many industries the processes of manufacture and construction are made more difficult and more expensive by a lack of skilled workmen. This lack is not chiefly a want

of manual dexterity, though such a want is common, but a want of what may be called industrial intelligence. By this is meant mental power to see beyond the task which occupies the hands for the moment to the operations that have preceded and those that will follow it, power to take in the whole process, knowledge of materials, ideas of cost, ideas of organization, business sense, and a conscience which recognizes obligations. Manufacturers confidently believe that a system of industrial education, wisely planned, tends to develop such intelligence while it increases technical skill."

The above does not appear to be incompatible with the demands made by the colleges for entrance credit. A thorough mastery of the fundamentals of the subject in hand is required in both cases. The first result then of a well-balanced course should be the attainment of a high standard of skill in the various tool operations and a thorough knowledge of processes and materials and the second, through the doing and learning of these things in a proper manner there should be a development of the habits that make for physical and mental efficiency and manliness.

For an actual outline of tool processes to be covered we need not look beyond what is already at hand. The outline before mentioned, compiled by the committee of the North Central Association of Colleges, has probably been as carefully worked out by as representative a group of men as may be found in the country. If any changes are needed, they would probably be called for an account of local conditions and the necessity for such changes would hold true for any general outline that could be made.

The sample or proposed course that will be briefly discussed in this paper is for the one subject of first year high school woodworking. It is based upon the outline recommended by the committee of the North Central Association of Colleges and upon the considerations before mentioned. The time devoted to the work is three eighty-minute periods weekly for a course covering one school year, making a total of one hundred and forty-eight hours. It is assumed that the work is either required or elective and that credit is given on the basis of one college entrance unit for two hundred and forty hours of work. The time spent, models made, and operations and principles involved are as follows:

Model.	New operations and principles.	Time.
1. Sawing exercise and cross-lap joint.	Planing, measuring, squaring, sawing, rules for planing.	2 weeks.
2. Nail box.	Ripping stock, laying out duplicate parts, grooving, nailing,	2 weeks.
3. Miter box.	Planing parallel edges and sides, use of winding sticks, use of screws.	2 weeks.
4. Mitered blueprint or drawing frame.	Making miter joint, rebating.	1 week.
5. Drawing board.	Making glue joint, gluing, clamping, surfacing, sandpapering.	3 weeks.
6. Mortise and tenon joint (hardwood).	Laying out mortise and tenon, chiseling.	2 weeks.
7. Dovetail corner.	Laying out dovetails, planing corners, advanced chiseling.	2 weeks.
8. Optional box, case, or chest.	Construction to involve use of panel; planing, fitting, gluing, clamping, inlaying, setting hinges, finishing.	6 weeks.
9. Optional small piece of furniture.	Construction to involve use of several duplicate parts with joints.	6 weeks.

The remaining ten to twelve weeks of this course is intended to be devoted to group work in the making of useful articles for the school or shop. Problems necessitating original design and drafting are recommended as of the greatest value. In the Madison High School where this course is now being followed, the group work last year resulted in the completion of several pieces for the teachers' rest room and for the Superintendent's office. This year the problem will be that of fitting up the dining room of the domestic science department with a complete set of furniture.

At the end of every five weeks' period during this course a test is given, covering the special tool operations and principles just completed and the grade of the test is averaged in with the final rank. A notebook is kept by each pupil in which drawings and directions for the making of each model are recorded. A special feature of the course will be the assignment to different pupils of topics on supplies and materials. These topics are to be worked out in the form of papers, showing source, method of manufacture, costs, etc., and collections are to be made and pieces mounted with explanatory notes attached. Before any model is begun a printed form must be filled in by the pupil for a stock list. This list shows number of pieces, name, size, kind of material, quantity, cost, and time spent on model.

The idea underlying the course is to select some of the basic tool operations in the subject dealt with, teach the exercises thoroughly and scientifically, have every pupil master every tool and understand each process, and make him prove it by bringing him to a test at

regular intervals. After a sufficient amount of skill and knowledge are developed, the work requires some planning on the part of the pupil until finally he makes a fine piece of cabinet work or furniture construction that is his own throughout. It is believed that through this course, if properly conducted, there will come not only manual dexterity, but an increased amount of mental and physical efficiency and the development of habits that make for a manly character.

The Report of the Manual Training Committee appointed at the 1908 meeting of this section was read and on the motion of Mr. L. L. Summers of Oshkosh, the report was put into the hands of a new committee to make a further report in 1910. It was voted that a committee of nine be appointed, which should consist of persons representing the different educational interests of the state, to take up the work of the present committee and make suggestions leading toward the formulation of a definite course of study in manual training.

The motion provided that the committee must meet at three different times during the coming year, and that the chairman should be a man not directly connected with manual training work.

Upon motion the meeting adjourned.

LOUIS F. OLSON,
Secretary.

WISCONSIN SCHOOL ARTS AND HOME ECONOMICS ASSOCIATION.

CONSTITUTION ADOPTED AT MILWAUKEE, NOVEMBER 5, 1909.

Article 1—Name.

The name of this organization shall be the Wisconsin School Arts and Home Economics Association.

Article 2—Purpose.

Its purpose shall be the promotion of instruction in the school arts and in home economics thruout the educational system of the state of Wisconsin

Article 3—Meetings.

This association shall hold one meeting annually in connection with the Wisconsin Teachers' Association, and in addition to this may hold one other meeting each year at whatever time and place is agreed upon by a majority of its members.

Article 4—Membership.

All persons interested in the promotion of school arts and of home economics in the educational system of Wisconsin shall be eligible to membership.

Article 5—Annual Dues.

The annual fee shall be one dollar for each member, payable at or before the annual meeting held in connection with the Wisconsin Teachers' Association.

Article 6—Officers.

The officers of this association shall be a president, a vice president, a secretary and treasurer, and three additional members of an executive committee, of which the other officers shall be members ex-officio.

Article 7—Election of Officers.

The officers of this association shall be elected at the annual meeting held in connection with the State Teachers' Association. The president, the vice president, and the secretary and treasurer shall be elected annually, the president to be nominated by informal ballot. The other three members of the Executive Committee shall be elected for one, two, and three years respectively, their successors to be elected thereafter for terms of three years.

Article 8—Amendments.

This constitution may be amended at any annual meeting held in connection with the Wisconsin Teachers' Association, by a two-thirds vote of the members present.

(Signed) Sophie H. Harris, Milwaukee.
Anna C. Nerman, Milwaukee.
and thirty others.

Officers elected November 5, 1909.

President—W. F. Faulkes, Appleton.

Vice President—Mrs. Bertha Johnston, Oshkosh.

Secretary-Treasurer—Newton Van Dalsem, Neenah.

Executive Committee—For one year—Lucy D. Hale, Milwaukee (Art); for two years—J. D. Phillips, Madison (M. T.); for three years—Ella L. Babcock, Racine (D. S.).

REPORT OF THE MUSIC SECTION.

Chairman—Mrs. Georgia C. Hyde, Janesville.
Secretary—Lily C. Hanson, Racine.
Treasurer—Edith McMillen, Ft. Atkinson.

The meeting was called to order by the chairman and announcements of a few minor changes in the program were made.

The first number was a model lesson to second grade pupils, conducted by Miss Lusk, Milwaukee.

The second number was an address, "The Care of the Child Voice," by Miss Lillian Watts, Director of the Department of Public School Music at the Wisconsin Conservatory of Music, Milwaukee. As the manuscript was in great demand at the close of the session, the address is given in full below:

THE CARE OF THE CHILD VOICE.

What are the real needs of the hour pertaining to the care of the child voice? It is surely time that we look for some solution to this problem.

Happily there are signs of unrest regarding the quality of tone we hear in the school room. We have all been so busy teaching "methods" and "rote songs" that the voice itself has received but slight attention. We have in some instances changed from the shouting of some years ago to the tiny little thin tone, the result of constantly telling the children to sing softer, softer, an improvement to be sure—but a process that devitalizes tone, and retards the natural development of the voice. Some have gone a step farther and follow a few well established rules—such as selecting songs suited to the children's voices. Singing from the upper register down. Monotones are given special attention—but here in many instances the voice training ends, and the rote song has its inning. All praise to the rote song, when properly taught it is one of the best features in our public school music course. But are children, who fail to recognize a singing tone, much less produce one, ready for the rote song? Children are all born with the faculties of speech and song latent; neither comes as a ready made accomplishment. They must be drawn forth into expression. *The voice* then, which is the medium of expression, should surely receive the first consideration of every teacher throughout the land. She should first of all develop a smooth, well modulated voice herself. Nowhere is the powerful effect of example so strongly shown as here. A teacher who has a quiet, refined, smooth voice, and pronounces her words distinctly, will have little difficulty in getting the children to do

the same. But you will say, "This is not practical. My voice is naturally poor." And whose fault is it? Surely not yours, but the fault of the musical training when you went to school. And this brings us right back to our starting point. What are the real needs of the hour pertaining to the care of the child voice? What shall we do that we may have better voices and more of them? Why is your voice poor? Isn't it a fact that unmusical people are the result of early neglect? There is a universal law, familiar to all of us, that our faculties grow with exercise and dwindle when neglected. "Use it or lose it," is nature's alternative. Children who are backward in speech are given special training because the importance of a command of language is recognized. If the importance of tone language were recognized as it should be—and had we in the past given more thought and attention to the development of the voice itself—we would not have the large number of teachers we have today dreading the music period. Why do they dread it? It is simply because their own voices are unmusical and unresponsive. There is not a teacher in our schools but could, in a short space of time, acquire all the theoretical and technical knowl edge necessary to teach the music required of every Grade—but the musical tone, feeling and temperament are lacking and can never be developed through the technic of the art. This must come through the voice with its power to express all kinds of emotion, and should start with the careful training of *all voices*. In the past, a child who possessed an unwieldy voice was told to keep still. He spoiled the singing. Truly we have made big strides since this practice prevailed. Still we have a long road ahead of us which we have only just entered. But when the children of today become the teachers of tomorrow, let us earnestly hope that they may never know the mortification and chagrin of many of our best teachers when called upon to take charge of a music class.

How can we make the training of the child voice practical? Children have had at least three years' use of the speaking voice in the home before they reach the school room. As the speaking voice is already in use it should receive first attention. All children should be systematically taught from the first day they enter the school room to speak singly and together in a refined quality of tone. Five minutes' regular drill each morning of using the smooth, even voice in speech, would start us on the road to improve the speaking voice of the American people. "But how would you conduct such an exercise?" I hear some one say. First of all, by imitation. How do you say, "Good morning, children." If you have given them a happy, cheery greeting, they will respond to your mood in both voice and manner, for you will find that they are happy and relaxed, and the voices as a

result are free and light. Imagine the contrast, if, when the children enter the school room, you should in an unsympathetic voice and manner say, "Good morning, children. Sit-up-tall-in-your-seats." You haven't given them a chance to greet you, and you have followed your own cold greeting with a command. Now, what has happened? You may be sure they are sitting up in their seats like "stiff little pokers," and their voices are dumb, not a responsive one among them. But what has all this to do with right tone conditions? *Everything.* If a child is tense and rigid, right voice emotion is impossible. To develop and possess the power to express joy, mirth, tenderness and other emotions, there must be first of all, freedom from restraint. Then let us see to it that the right atmosphere surrounds the child. Good cheer, sympathy, interest and love, and you will be rewarded. You will hear inflections and intonations developing in the speaking voice that will be of untold value to each child.

Careful attention to the speaking voice will do much to bring out the purity of the singing voice. However, in the singing voice we are called upon to employ a much wider range of tone than we use in speech; added to that is the essential requirement of making the tone beautiful, instead of permitting it to become a shout or a dull, devitalized little organ, as is the case where much soft singing is insisted upon. Another difference is: The act of talking serves to hold back and suppress the breath, because of the large proportion of consonants and the fact that the vowels are very short; where, as in singing, the prolongation of the vowels causes the breath to be rapidly wasted, until its control is learned. Respiration should from the first support the vocal effort, without, however, drawing the attention from the tone work.

Beauty of tone and ease of production form the foundation of good singing and the long life of the voice. A good tone cannot be guttural, throaty, nasal, breathy or forced. This fault should be corrected in the speaking voice, where the habit is first formed. The child on the street, calling to a playmate a block away, illustrates one of the best vocal exercises I know of, to correct these very common faults. I allude to the "hoo-hoo" usually given on E and C sharp. This tone is clear and true, and perfectly free from throat effort. The ease and spontaneity with which it is given shows where a child's voice may easily lie well supported and perfectly free from forcing. The beginnings of forcing, like other bad habits, may escape all but a most practiced ear, and to avoid this, almost universal fault, exercises should be provided and time taken to produce free, open, pure tones. "*Vowel tone is voice,*" and to produce the various vowels, consonants, diphthongs and syllables is not a work of chance but requires special, care-

ful study. Symmetrical development of the voice depends upon the blending of the tone, from "F," fifth line, to "F," first space, beginning vowel exercises in the middle of those two extremes and not allowing too much stress to be used upon the lower or upper tones. Children can easily be taught to distinguish between right conditions which produce the clear, pure singing tone and wrong conditions, the tight throat; and should never be allowed in exercise or song to use any other than the singing tone. In addition to the "singing tone," the agility of the voice should receive special consideration. To obtain the best results we should begin at "the top of the voice," carrying the clear quality we find here down, blending all parts of the compass and bringing all possible groupings of scales into use—in duple, triple and quadruple rhythm, that the voice may be trained to bound along evenly, without a break and without restraint. This will take the effort from the throat and vitalize the voice as nothing else will. *The next step* to consider in the care of the voice comes when two-part work is introduced. Most children have soprano voices. Altos are rarely found. Those who are considered altos are only forcing their thick tones unnaturally. This low alto quality, in an alarmingly big per cent of voices, is produced by the tightening of the throat muscles in all low and middle tones. Their voices are not strong on the low tones and as soon as they are in the least degree forced, the muscles rebel and contract and untold harm is done. Hence, the use of rounds and cannons should lead all other exercises in the two part work, and great care taken that the same voices are not confined to the lower register. I would have the children sing many of their familiar songs without the words. They know the words and by singing the song with a single vowel, they can more readily be guided to express by the voice itself, the true sentiment the song or the melody possesses. This method will develop both tone, thought, and how to express it. Governed by the one and inspired by the other, the simplest melody will take on a new meaning. I wish right here to give the definition of singing as it was given to me some time ago: "Singing is the interpretation of text by means of musical tones produced by the human voice." I like that definition. It implies that the creation of a musical tone is for the purpose of interpreting song. And no singer can accomplish all that is within the scope of his voice in the matter of interpretation unless that voice is under proper control.

In the professional field, one usually stands or falls in the estimation of his listeners in proportion as he voices their own sentiments, but surely we should get together, as it were, in points which must of necessity command the attention of all. By friendly interchange of

ideas, we might so systemize the work of the teacher that much, which to many is only partly clear, might be made entirely so.

My subject, "The Care of the Child Voice," is much too serious and involved a problem to more than suggest a line of thought that may serve to awaken a fresh interest in the care of the young voices entrusted to our care. I wish to emphasize a few leading thoughts that will surely help in the care of the voice:

1. The atmosphere of the school-room.
2. Five minutes daily drill in special attention to the speaking voice.
3. The singing tone contrasted with the speaking tone.
4. Exercises to develop the sustaining quality of the singing tone free from rigidity, such as rapid, smooth, distinct and light singing of 1, 2, 3, 4, 5 ah at easy pitches, with right breath control and laughter in the tone, and vowel exercises.
5. Scale and arpeggo exercises to blend the registers and develop the agility and vitality of the tone.
6. Songs. It is here, as nowhere else, that the mind should stand forth and reveal its power through the medium of the voice to express the messages the song contains.

These conditions are at present unusual and ideal. But ideal conditions argue for ideal results, and if we cannot have ideal conditions, we can set them for our standard and come as near to them as possible.

Mr. Thomas R. Lloyd Jones, superintendent of schools, Fond du Lac, gave an address, "Essential and Desirable Qualifications of a Successful Supervisor." Mr. Jones said in part:

"The true value of a teacher cannot be measured by his surface popularity, but by the standards he sets for himself and for his school, by the motives he has awakened from within his students rather than by a superposition of sham desires upon the outside.

The supervisor of music must be a man (or woman) of culture, possessing knowledge of history and literature, in order that he may intelligently interpret the motives of the masters.

He must have a good technical training and should be able to put before his pupils models for them to pattern after. He should sing for, and only occasionally sing with, the pupils.

He should have been a successful special teacher, and fortunate, indeed, is that supervisor who has had actual experience in a grade room, five hours a day, five days a week, forty weeks a year for several years. He must be mature in thought, ripened, dignified, yet free.

He must be able to teach teachers how to teach children. This requires tact, insight, and courage.

He is the personal representative of the superintendent, and as such must keep him informed as to the progress of the work. He must closely supervise the work in music, give model lessons and observe frequently the lessons given by regular teachers, for the progress of the class depends upon the work done between the visits of the supervisor.

He should avoid friction, but not at the expense of a lowered standard of efficiency.

He must be big enough to work through the teachers, helping, encouraging, and complimenting them for their efforts and be content with the reflected glory that comes.

To such a supervisor there will come a sweet recognition from the thoughtful and a conscious pleasure in work well done."

A Model Lesson in first grade work was given by Miss Ida E. Bach, Director of Music, Milwaukee Normal School. This was followed by a lesson in sight reading, given by Mr. Robert S. Parry, Columbus, assisted by pupils from the Milwaukee schools.

Miss Eleanor Smith, of Chicago, gave an address on "Songs," in which she classified those suitable for children as the folk-song and the artistic song. She laid great stress on the fact that teachers should not lose sight of the power of music in their endeavor to impart technical knowledge. Miss Smith went on to say that as music expresses every emotion, great care should be exercised in the selection of music for children. Good music may be defined as that which lasts the best, which has a permanent charm. Bad music has neither melodic nor harmonic value, but depends entirely upon rhythm for its attraction. The teacher has a right to her own private taste in music, but she must differentiate between good and bad music when teaching children and not impose private taste in the place of the result of expert judgment.

Miss Smith illustrated her talk with some beautiful little songs which exemplified the necessity of having words and music go hand in hand, and which showed the simplicity and spontaneity of really artistic children's songs.

The last number on this program was an address, "High School Music, Its Different Phases and Possibilities," by Mr. Theo. Winkler, Supervisor of Music, Sheboygan. He spoke in part as follows:

We can expect of pupils who enter the High School that they should be able to read music at sight without recourse to the scale syllables. To make chorus work a success the scale syllables must have been largely dispensed with in the higher grades.

* * * * * * * * * *

Three phases of our work that should find their place in a High School Music Course are:

1. Chorus practice.

2. The study of some masterpieces of music with the intention of leading to an appreciation of good music and the ability to listen intelligently.

3. Special work for pupils that are especially inclined to this work and desire to continue the study of this art.

The chorus practice should be compulsory for all students, at least during a part of their High School life. The character of the material chosen is of great importance and music should be selected from the rich collection of masterpieces in order to hold the interest of pupils.

All pupils should have a general understanding of musical forms and their characteristics, of orchestral instruments and their functions, of the history of music and some great masters and performing musicians, emphasizing our own American composers. The mechanical player has its place in acquainting pupils with the work of the masters. Through our High Schools we should be able to counteract the pernicious influences of cheap play-houses and cultivate a taste for the best in music.

The purpose of the High School orchestra is to give pupils a chance to express their musical talent and to encourage pupils in their private music work. Only the best music should be rendered.

Music to fulfill its mission in the High School can do so only when placed on a level with other subjects. The music course should be elective and should include the rudiments of theory and harmony, musical history and biography, special training in sight singing and hearing, the study of musical form and of masterpieces in music.

In closing, Mr. Winkler urged supervisors of music to work towards an improvement in High School music in order to secure for it the proper recognition in Universities and Colleges.

On Friday afternoon, after listening to a chorus of pupils from the Milwaukee schools, who, under the direction of Mrs. Frances E. Clark, sang and illustrated a number of flower songs at the Auditorium, this section repaired to the City Hall for a Round Table discussion: "Music in Our Rural Schools, What May be Done to Promote Its Advancement."

a. The County Institute.

b. The County Training School.

Twenty-five supervisors and several grade teachers were present.

Mr. Willis P. Colburn of Viroqua made a short address setting forth the needs of the County Teachers' Institute and of the County Training School in preparing teachers to teach music. He said that much

was being done but that the Course of Study formulated by the committee appointed two years ago could not be followed. After considerable discussion Mr. Colburn made a motion that a committee of three be appointed for the purpose of suggesting a course in music that would be suitable for teachers who go out into the country school—one outline for two, one for four, and one for six weeks' training. The motion was seconded but after further discussion, Mr. Colburn changed his motion to stand as follows: A motion to appoint a committee of five to amplify the Course of Study formerly made out by the Committee. This motion was carried by a majority of five. The Chairman appointed the following as members of this new committee: Mr. F. F. Churchill, Platteville, Chairman; Mr. W. P. Colburn, Viroqua; Miss Lucy Baker, Whitewater; Miss Edith Harney, Milwaukee; Mrs. Georgia C. Hyde, Janesville.

Mrs. Frances E. Clark read an extract from a letter written by Mr. Case of the State University, urging the supervisors of the State to use their influence in securing recognition of High School Music at the University. He suggested that this recognition would be granted only when supervisors of the State demanded it. No action was taken.

Mrs. Hyde urged that an Association of Music Supervisors be formed, but as the hour was growing late and many had been obliged to leave, it was decided to work the matter up during the year and make an attempt to form an association at the next State Teachers' Association.

Meeting adjourned.

LILY C. HANSON,
Secretary.

PHYSICAL EDUCATION SECTION.

The annual meeting of the Wisconsin Physical Education Society was held in the School Board Hall, City Hall, Milwaukee, Thursday, Nov. 4, 1909.

The meeting was called to order by the president, Dr. J. C. Elsom. In accordance with the decision of the last meeting the business preceded the reading of the papers. In his opening remarks Dr. Elsom urged the members to work for a stronger organization and more united action.

It was moved and carried that a committee be appointed to draw up a resolution asking the Board of Regents of the Normal Schools, first, That the physical conditions of all applicants to the Normal Schools be considered with their other qualifications; secondly, That attention be given to theory and methodology in physical training.

Dr. Elsom brought to the notice of the society the condition of the eyes among men at the University, and made a motion to the effect that the subject be brought to the attention of the State Superintendent, with the object that medical treatment be given before the University age. This was amended by Dr. Wittich to include a course in school hygiene in the Normal Schools. The same was seconded and carried.

Seven new members were elected. Dr. J. C. Elsom was re-elected president, (Miss) M. Ada Turner, secretary and treasurer.

Following the business was the program. Dr. J. Ellen Dodson, medical examiner for women at the State University, gave a very interesting paper, "Corrective Exercise for Women."

Before the reading of the second paper, the president asked Mr. H. S. Curtis, vice-president of the Playground Association of America, Worcester, Mass., to speak on that movement.

Dr. Witlich's paper, "The German Turner System of Gymnastic Competition," was made doubly interesting by photographs of the meet at Frankfort.

L. M. Zarfos presented the third paper, "The Value of Recreative Exercise."

A meeting of the women of the Society was called at one-thirty, Friday afternoon, and was well attended, Miss Abby Mayhew of the University presiding. The discussions were informal and related to the well being of the girls and young women attending our public schools and colleges.

M. ADA TURNER,
Secretary.

PAPERS READ AT THE GENERAL SESSIONS.

PRESIDENT'S ADDRESS.

JOHN KELLEY, Juneau.

Sheltered, as you are, by this magnificent environment, the Wisconsin Teachers' Association should be in a receptive mood for the literary and musical feast to which you have been invited. The programs which will be presented to you, in the general sessions and in the sectional meetings, will, I trust, invite your close attention and elicit your hearty co-operation.

The success of the Fifty-Seventh Annual Convention, in which you are now assembled, depends quite as largely upon the attitude of the hearers as upon the efforts of those who have been chosen to instruct or entertain.

In an amphitheatre of these dimensions it may not be an easy task to convey the several messages; hence, I trust that I may be pardoned in asking you to maintain such order as will facilitate their delivery.

That which is but half understood is wholly lost.

You are here assembled in the performance of a serious,—yes, a sacred duty—that of better preparing yourselves for the discharge of an obligation which deals with the most effective methods of properly educating the 600,000 children in the commonwealth of Wisconsin. In the proper discharge of this duty lies the future of the individual of the state and of the nation. We are sometimes told that the task of the teacher is a hopeless one and at times it might so appear; but let us remember that while darkness always covers one-half of the face of the globe it is ever succeeded by light, even to the brilliancy of the sunshine.

Unlike the farmer who turns the furrow, the teacher can not at sunset look back over his field of labor and note the depth and area of his cultivation. The human machine which he inspires to activity does not turn out a finished product that can be placed upon the world's market weekly or monthly. The house-builder works in the light of day, dealing with things material. Every block, brick or board added

to his structure is visible evidence of his progress and his skill. Not so with the teacher. The implanted seed is hidden for many years beneath the battered cap of the boy or the calico sun-bonnet of the girl, and he often asks himself "What will the harvest be?" The slow returns tax the patience of teacher, pupil and parent alike, to a degree that sometimes evokes most unfavorable criticism, which may crystallize into a charge against the efficiency of the school.

The broadening of the course of study is said to be a mistake by a certain get-wise-quick class of people who sometimes assert that the schools of today are not so good as those of forty years ago. In support of that position it is contended that penmanship has become a lost art, that defective spelling is labeled "reformed," and that arithmetic is exemplified largely through the mechanical operation of the Burrow's Adding Machine.

That these assertions are *wholly* untrue can not be successfully argued. We *have* sacrificed some intensity along narrow lines in order to broaden the pathway for the accommodation of an ever increasing number of travelers.

In the early day schools, especially in rural communities, the ability to solve any problem in Robinson's or Ray's Higher Arithmetics was considered a superlative accomplishment, while a memorized knowledge of the accepted order of letters in the words found in Sander's spelling book was a coat of mail invulnerable against any attack from a neighboring district on the night of the spelling school. Words were the signs of war—rather than of ideas.

However, I am free to admit that this form of instruction, although narrow in its foundation, was ground down to a razor edge which cut deep into the brain-pans of those who bared their heads to its operation. The early day schools were channels of thought, deep, but narrow and land-locked. The schools of today are oceans of mentality, touching every shore, every race, every activity. If education has for its aim the development of the powers of man, we can best determine the efficiency of methods by the results attained. Looking at the *was* and the *is*, a marked difference is apparent.

Agriculture, manufacture and commerce are the three great activities. In each of these great industries radical and marked changes have taken place within the life time of the older members of this association. These changes are the fruit of a new and stronger power given to man through the training of the head and the hand. The use of modern machinery and modern methods in agricultural pursuits has drawn from the soil many latent resources, not dreamed of when this Association was incorporated fifty seven years ago, nor for many years subsequent. Soil elements but then little understood are now

common fireside talk of the husbandman. In his ignorance, the early day farmer committed grand larceny annually. He robbed the soil of its fertility with little or no intention of restitution. Now, however, he is becoming more than magnanimous in his treatment of "mother earth," because he finds it more profitable if not more blessed to give than to receive. He is willing to cast his bread upon the waters that it may be returned an hundred fold. Scientific certainty has superseded luck and chance, and he waxes fat and smiles contentedly except—when touched by gout or indigestion. The onward strides in manufactures and commerce are quite as strongly marked. The furnace fires of factories are never banked. The shuttle is like Tennyson's Brook, and the iron horse, freighted with his cargo from factory to fireside, does not even stop for water. The ocean greyhound crosses the sea in less time than the Mayflower could fill her sails, while the triumph of the aeroplane is flashed athwart the heavens by wireless telegraphy. In the classic language of Young America: "We are going some."

But what has all this to do with the Wisconsin State Teachers' Association? We are not tillers of the soil, neither are we sailors or engineers. I know of no Edisons, nor Wrights nor even Barney Oldfields in our ranks—albeit goggles and veils are becoming fashionable. As viewed by the world, we are plodders, plain schoolmasters and—pretty school mams. Our field is the school yard, our forum, the rostrum.

In this little arena there is a continuous performance in which the children are the actors, the teachers, the ring-masters. The audience that should be present—the parents of the amateur performers—engrossed in home duties, professional callings, trade activities or social functions, are lamentably absent, and the isolation of the teacher enshrouds her in an obscurity quite as opaque as the brick walls within which the foot-ball coach instructs and trains his team for the approaching contest. The school house is too often looked upon as the parcel room of the home where the children are checked in at 9 and out at 4.

If the package is not damaged externally the owner files no complaint, as the contents are rarely examined.

It is taken for granted that the teacher is familiar with the material beneath the surface and that she is increasing and enhancing its value from day to day. Woe unto that teacher, if when the time-lock is removed and the seals broken, the safety deposit boxes are found to contain wind instead of wisdom, words instead of worth. Or worse still the condition if she has forgotten the combination and the rust-eaten lock refuses to yield at all.

Education is the foundation stone of the nation. It should be well laid, to sustain the ever increasing weight of the superstructure and insure its stability. No unskilled or careless hand should be allowed to place it.

The nucleus of this educational stone is fashioned in the Kindergartens and primary departments of our schools. It is more or less plastic, highly adhesive and as it moves on it takes from contact some of that which it touches. It is under the guiding hand of the teacher until it so crystallizes with age that it refuses accessions.

It may become immoveable at the high school door or it may keep on until it is university polished. But wherever it halts or however shaped, it will be found to have taken its texture from its pathway.

Education may also be compared to a tree, with its three parts, root, bole and branch, each essential to the life of the other two. Or to a flower, in its growth of bud, blossom and fruit. Each part requires its suitable food for proper development.

Did you ever measure the magic of the word *three* by noting the frequency of its use? We speak of morning, noon and night; the sun, moon and stars; hours, minutes and seconds; years, months and days; solids, liquids and fluids; youth, manhood and age; faith, hope and charity. I might multiply these illustrations indefinitely.

It is but natural then that we should make a three-fold division of education, that of the hand, the head and the heart, with a view of the highest manual, mental and moral development. While each is essential to the highest attainment, like the cardinal virtues of Faith, Hope and Charity, one is the greatest.

I place the education of the heart as superlative. The moral fiber of life is the web thread of its texture. It runs through its entire length and holds securely in place the woof of its varied activities.

How best to work out the great problem the teacher has undertaken, you are here to consider. I believe the solution lies in constant training. Train the hand much of the time, train the head most of the time, train the heart all the time.

GATHER UP THE FRAGMENTS THAT NOTHING BE LOST.

CARROLL G. PEARSE, Milwaukee.

The continuation and success of our free institutions is not possible without an intelligent citizenship. In order that every young person who is growing up to be a citizen may acquire the necessary knowledge and judgment, the American people maintain a system of public schools which makes it possible for every boy and girl to ac-

quire the intelligence which makes for efficiency and good citizenship.

That the purposes of the people in providing schools may be fully carried out, it is necessary to get, not a part of the children but all of the children into the schools; it is necessary, after the children are gathered in, that they shall be so instructed and so led as to get, in the best possible way, the benefits which the schools are intended to give; and to make the system of education complete, it is necessary to make some provision for those who cannot continue through the full course of studies offered, but for financial or other reasons, must drop out before receiving the full benefits of the schools.

It is necessary, therefore, first, to gather all the children of the state into the schools; then no fragment of them will grow up ignorant and inefficient because they have not had the opportunity to learn what the schools are intended to teach.

If we are to get into the schools all the children who belong in them, we must provide good and ample accommodations. We must provide proper rooms with good light, good ventilation, enough comfortable seats, and such sanitary conveniences as will conserve the health and the modesty of our pupils. We cannot consistently invite or require parents to send their children to schools in which their health will be undermined or endangered by the physical conditions which surround them. All children have a right to the best and most wholesome conditions and we who are connected with the schools must feel our responsibility and must continue to demand accommodations both ample and wholesome until we obtain them for every child.

In every large city, and sometimes in less densely populated communities, there are numbers of parents who do not appreciate the value of education to their children. Such parents may have acquired their social and industrial ideals through generations of grinding poverty and inferior social conditions abroad. They may have grown up where from time immemorial, it was the rule to take children out of the school and end their school education as soon as they were able to earn a little money. They thus either ceased to be a charge upon the family income or they were able by their earnings to add to that income. Such parents must be educated to appreciate the different conditions under which American citizens live, and the necessity for a more generous education in order that their children may profit by, and live as they should under the different social conditions into which they have come. To insure proper education for this large fragment of the school population, most school systems must maintain an efficient truancy or attendance department to look

after children who are improperly taken from school at too early an age, and to see that these children are returned to the schools.

A great share of the work of a well organized attendance department lies with the parents. For every child who does not attend school, someone is responsible. The duty of the truancy department is to find the responsible parents or guardians. These must be informed as to the laws requiring the attendance of their children at school. It is best also that they shall be informed of the advantages which the state wishes to confer upon their children by requiring that a minimum of education shall be given them. A well organized attendance department can do a great deal by way of educating these parents who have come from foreign countries where the industrial conditions were very different, and helping them to apreciate the spirit and the opportunities of our American life.

It is necessary, in the second place, that, when the children enter school, they shall be cared for and managed so as to give them the greatest possible benefit.

This requires good teaching for all children, and such attention to individual pupils that they may not become discouraged and on account of this discouragement drop out of school to grow up in ignorance; it requires care and special provision for special classes of children who are physically or mentally unlike other children to such an extent that they cannot profit by the instruction which normal children receive; and it requires also that we shall from time to time vary the subjects of instruction which we include in the school program, and vary the methods and plans of instruction so that the schools may meet the changing social, industrial and commercial conditions of the time. If we do not do all these things, little groups of boys and girls—little fragments of precious school "material"—will be dropped out or pushed out of the schools, to grow up in ignorance and inefficiency.

If we are to do as well as we ought for all the children, they must be well taught. Good teaching can be done only by good teachers—teachers who are not only well prepared in the subjects they are to present but who are also thoroughly in the spirit of the work. Such teachers will look upon the work of the school room day by day as an opportunity and not as a task. The possibility of benefit to the individual children who sit in their classes will seem to them the most important feature of their work. They will have eyes to see and ears to hear, and, what is more important, hearts to understand the individual needs, the individual abilities and the individual temperaments of the children who are their pupils; and they will be satisfied only when they understand each pupil and when each pupil is doing his best and getting the most benefit possible from his school work.

Where the attention which can be given to the backward pupils at class time is not sufficient, a certain time should be set aside during which the teacher will give individual help to the pupils who require it. The best teachers have always found time to give this special help, but those who lack skill in planning or who lack interest in their pupils will be sure to neglect it if some special time is not set aside in which it shall be done. For this reason the establishment of a "special help period" is necessary. In this half hour, children who are beginning to drag, who are slow to understand, who need special practice, will be taken in hand to be studied and helped by the teacher. The teacher's first thought will be to ascertain the cause of the pupil's dullness or slowness or failure. When the cause has been studied out, the next step will be to show the child how to help himself so as to overcome his weakness. Where he needs it, he will then receive the help of the teacher in climbing up to the average of attainment shown by his fellow pupils. The teacher who uses the special help time as a period of punishment or detention, or who merely tells the child to work five examples or ten examples like the one he failed to do at class time, or to write twenty times the words he missed in spelling, fails utterly to understand the purpose of the special help period or the opportunity it gives to the teacher for helping these pupils to build themselves up.

Where the school contains a considerable number of pupils who are of ordinary ability, but are a year or two, or perhaps three or four years older than the average of the class in which they are, the "ungraded class" will be provided. This is not a class for dull or defective pupils; it is a place of opportunity where children who ought to gain time on the marching procession of classes will be permitted and helped to do so. A boy who could be promoted except for his poor work in arithmetic or his poor work in language will receive special attention in these subjects until he is able to enter the class in which he ought to be. The young foreigner who does not understand the language will receive the help he needs in the elements of the speech of the country. The over-grown boy or girl who has had poor school advantages will be put into this class so that, by extra effort and diligence, the work missed through former lack of opportunity can be made up in a shorter time, and the pupil advanced to a class in which the pupils are of his own age and of similar general strength and ability.

The school will also care for thos especial classes of children who cannot receive the instruction of the schools in the usual way. Some children have defective hearing; these will be carefully examined to see whether the defect is one which can be removed or whether the

children should be placed in special classes and taught by special methods. Some children have defective eye sight. Special care will be given to ascertain whether these, by proper medical or surgical treatment can have their eye sight made normal or nearly so, or whether the vision is so defective that they must be taught by special methods in special classes. Some children lack energy and vital power and so are failures in their school work. Care will be given to these to ascertain whether, by proper medical or surgical treatment, their vital processes can be made normal and their strength brought up to the required standard. It may be that some surgical operation for the removal of adenoid growth or the correction of malformation, the correction or repair of the teeth, or some similar measures will render the children normal again or nearly so, and enable them to do the work of the school in the required way.

In the third place we must provide for that considerable fragment of our great company of boys and girls which is forced out of the schools by the stern necessities of life, to begin the battle of wage earning handicapped by imperfect education. We must provide in some way that these young people may continue the education which has been thus cut short. For a part of them the evening schools will furnish an opportunity, either to complete the work of the elementary school, or, where they are ambitious, to take up work in high school subjects, as a considerable number of them are doing in those cities where the oportunity is afforded.

For that fragment of our pupils, who, apparently, must be out of school for a large part of each day to earn money as news boys or venders of small wares upon the streets, we may by legislation provide that, to get permission to do this work, they must spend a certain number of hours in school each day. The schools can then give them instruction at a time when they can come without making it impossible for them to earn money.

In our industrial cities the increasing number who leave school at an early age to enter shops, factories and other industrial institutions must, in the near future, be provided for by schools similar to the continuation schools now conducted by many European governments. We must recognize, as they have recognized, that these young people have not received from the State all that is their due. The State must provide that during some daylight hours of each week these young people shall be allowed by their employers to attend such instruction as the schools may provide to meet their needs.

By such instruction, continued through the years while character is forming, the lives of many young people may be given a strong impulse toward usefulness and good citizenship.

The efficiency of any institution may be known by the completeness with which it carries out its purposes; and to be most efficient and so to justify in fullest measure the confidence of the people who maintain the schools, and the expenditure of money which the people make so cheerfully, those who manage school systems should never cease to study how to save these fragments of that material which the community furnishes to the schools. Thought must be given to each of the different classes whose members are in danger of failing to receive the full benefit of the education the schools offer; and school authorities must be ever on the alert to adapt our educational system and our educational methods to meet the needs not only of the majority, but of these fragments. Only in this way will it be possible so to gather within the fold of our educational system all these fragments, that none of them be lost.

REPORT OF THE LEGISLATIVE COMMITTEE.

The Legislative Committee representing the Wisconsin State Teachers' Association was responsible for the introduction of four bills in the Legislature that met January of this year. The bills were as follows: A bill increasing the number of copies of the proceedings of this association from 3,000 to 5,000; a bill which made it permissory on the part of boards of education to engage superintendents for a period of from one to three years; a bill changing the mode of electing the county superintendents of schools; and a bill known as the certification measure.

The bill providing for an increase in the number of copies of the proceedings was introduced in the Assembly but failed to pass. There was a widespread opinion among the members of the Legislature that too much money was being spent on state printing, and hence the opposition to this and similar bills. Later in the session a committee investigated the entire matter of state printing, and the secretary of this association together with many others, was asked to appear before the committee, and she convinced the committee of the necessity for increasing the number of copies to 5,000. Assemblyman Viebahn thereupon resurrected the measure and no difficulty was experienced in securing its passage.

The bill giving the power to boards of education to make contracts with superintendents for a period not to exceed three years was suggested by Superintendent Landgraf in a paper read before this association last year. The legislative committee introduced this bill through the courtesy of Assemblyman Viebahn and but little trouble was experienced in securing favorable action on it.

The county superintendency measure was originally in charge of a committee appointed by this association consisting of the following members:

Duncan McGregor, John Hazelwood, W. D. Hoard, C. J. Brewer, Leo. P. Fox, A. M. Olson, L. W. Wood, John Sims, C. G. Pearse, Charles McKenny, C. P. Cary and C. E. Patzer. This committee met in October, 1908, and spent considerable time discussing the general question of "How to improve the supervision of country schools". One plan after another was proposed and rejected, either because it was not thought feasible, or because the legislature had several times declared itself against the proposition.

Finally the plan suggested to this association two years ago was considered, and after a most frank and thorough discussion the committee unanimously endorsed the idea of having the county superintendent appointed by a county board of education, to be elected by the people of the county. After instructing the chairman and Superintendent Fox to work out the bill in detail, the committee adjourned.

In December, 1908, the committee having in charge the proposed change in the mode of electing the county superintendent, the legislative committee of this association, and the legislative committee appointed by the county superintendent's association, met in joint session to consider the rough draft of the bill.

Every feature of the bill was carefully gone over, each provision being acted upon separately. Many changes were proposed and embodied in the bill, so that it may be said that the bill reflected the best thought of the members of the three committees that considered it.

At an informal hearing before the joint committees on education of the legislature the fundamental propositions of the bill were presented and discussed, and several changes were suggested by members of the committee. The bill was then considered by the assembly committee on education, and the members were so favorably impressed with the merits of the bill that they decided to introduce it as a committee measure.

In May, 1908, the proposed change in the election of the county superintendent was discussed at the annual meeting of the county superintendents, held at Oshkosh, and with but a few dissenting votes, a resolution endorsing the plan, was passed.

At the regular meeting of the county superintendents held at Madison, in April, 1909, the bill was presented by the chairman of the county superintendent's committee, and after a full discussion, it was endorsed with but two or three dissenting votes.

At the public hearing before the assembly committee on education some nine or ten persons spoke in favor of the bill, and not one ap-

peared against it. The assembly committee later raised the question of constitutionality, but that matter was soon settled by a written opinion, secured from the attorney general's office, to the effect that the amendment to Article 10 of the constitution, clearly authorized such legislation. By a unanimous vote of the assembly committee, the bill was recommended for passage. The bill, according to the chairman of the assembly committee, seemed to have clear sailing, but the assembly experienced a change of heart a short time before the vote was taken, and the measure was defeated by decisive vote.

The objection to the measure, so far as the committee could learn, was that it took power away from the people, and hence was undemocratic.

As an answer to this charge, attention may be called to the follow- excerpt from Superintendent Cary's latest report:

"The concensus of opinion seems to be that our present system of selecting county superintendents is radically wrong, and should be changed. From 12,000 to 14,000 educational positions are filled in the state each year by boards of education, elected by the people; that is by applying the principle of representative government. However, when it comes to the selection of 73 county superintendents, the method of electing by direct ballot is still employed."

At the meeting of the joint committees in December, 1908, a suggestion was made by one of the members that it might be well to prepare a minimum salary measure. This suggestion was received with favor, and Mr. McKenny was requested to draw the bill, but to include in it a higher educational qualification for teachers.

The legislative committee, however, discovered through interviews with members of the legislature, that a minimum salary measure would meet with but little favor. Thus it happened that the rider to the minimum salary bill became the horse.

The principal feature of this measure, which became known as the certification bill, was the provision demanding an attendance of at least six weeks at a professional school for teachers, in addition to passing an examination in academic branches.

The question, however, arose early, as to the necessity of defining what was meant by the term "Professional School" as used in the bill. In the first draft of the measure it was provided that this professional training could be secured in a county training school, a normal school, a high school, or any school in rank above a high school, offering a course for teachers, equivalent to that offered in a state normal school; or in counties remote from normal school or county training school, in a teachers' institute, maintained under such conditions and restrictions as might be provided for by the board of normal school regents.

When this bill was submitted to a meeting of the legislative committees of this and the county superintendents' association, objection was made to having the high schools give this training, and at a subsequent meeting which was attended by members of both legislative committees, and by a number of principals of county training schools, it was strongly urged not to introduce the provision authorizing the high schools to give this training.

It was agreed, however, that the three or four schools which had organized professional courses, should be authorized to continue giving such training. A bill was drafted embodying this feature and introduced in the legislature.

At a meeting of city superintendents and supervising principals held in Milwaukee in the spring, the bill was presented by Mr. McKenny. In the discussion that followed, it became evident that the high school men were in harmony with the bill as drawn, and were opposed to the idea of urging the high schools to become training schools for teachers. A resolution was adopted endorsing the bill. Only four votes were cast against the resolution, and two of these were cast by men who were opposed to the clause, which, as they expressed it, gave special privileges to a few high schools.

The assembly committee, however, reported out a bill recognizing all high schools, that organized normal departments approved by the state superintendent, as coming under the provisions of the bill. Our legislative committee was not apprised of the action of the assembly committee until after the bill as amended by the assembly committee had passed the assembly. We were surprised at this action because it was wholly at variance with the views of educational men in the state.

While the bill was in the hands of the senate committee, the assembly committee changed its attitude in regard to allowing all high schools under certain restrictions, to engage in the training of teachers, and urged the senate committee to amend the bill in such a way that only those high schools then giving such professional training, should be recognized, thus going back to the original bill. No member of our legislative committee appeared before the senate committee at the hearing on the bill. But when Superintendent Kennedy reported that the senate committee on education threatened to strike out the clause relating to high schools entirely, efforts were made to induce the senate committee to reconsider the matter, and accept the amendment offered by the assembly committee on education. But it was too late, and thus it happened that the bill was reported out and passed, cutting out the high schools entirely.

Perhaps the committee erred in holding that the high schools should be barred from giving professional training to teachers. If they did,

the error must be charged to their desire to have the bill reflect the thought of the great majority of educational men in the state who were pronounced in their opposition to the idea of transforming the high schools into training schools for teachers.

I can only guess as to the motives which actuated the superintendents and principals in voting practically as a unit in favor of the bill that excluded the high schools as a possible training school for teachers.

In all probability the older men had in mind the attempt made in this state covering a period of twenty years, to have the high schools train teachers, and how unsuccessful they were in their efforts. The failure to meet expectations was due to the fact that the training of teachers was but an incident in their regular work. As a result the law requiring this instruction was repealed, simply making it optional if students demanded it.

As a farther result the county training schools for teachers were called into being in 1899.. There are twenty-three such schools in operation now with four more in prospect. A former state superintendent characterizes these schools as the best system of training yet devised in the United States, for the preparation of country school teachers.

The last legislature also authorized the Normal schools to organize courses of study which shall be the full and fair equivalent of the course of study prescribed for the county training schools by the state superintendent. There are three normal schools training teachers for the country schools, with five more in prospect. Thus within a short time we shall have 35 institutions whose purpose it is to train teachers for the country schools.

The county training schools are now well established. Their courses of study may have to be changed, and possibly strengthened, but in view of the fact that these agencies ought to be tried out fully, the course pursued by the high school superintendents and principals appears to be highly commendable.

Growth always involves pain. No social change is ever introduced but that it seems to work injury to a few. Every new machine that is invented temporarily throws some men out of employment. The lifting of the standard of qualifications for teaching may work some hardship in the case of those who cannot afford to secure the additional training, but no one, let us hope, will argue that for this reason there should be a halt in educational advancement.

It was deemed wise to enter thus fully into the history of the bill that culminated in the law known as the certification measure, because of its importance and far reaching effect. It is admitted that

the law may not be perfect; it probably will need to be changed at some future time. No law which is a distinct departure in a new field can in the very nature of things be perfect, no matter how much the time or how great the effort spent in drafting it. What we ask is that the law be given a fair trial, and if it does not work out in practice, as its framers hope it may, its defects can easily be corrected.

Wisconsin is on the threshold of large reforms in the matter of school legislation. The county training school law, the law authorizing the normal schools to train teachers for country schools, and the certification measure, all point to greater initial efficiency on the part of the young teacher. The soil is prepared for other constructive measures, which will help in solving the problems of elementary education.

We have the machinery by means of which educational fads and fallacies, and purely Utopian schemes can be sifted out so that they will not secure the endorsement of this body. We are, however, lacking in that we show little perseverance in adhering to a plan of campaign. Perhaps this may be partly due to the fact that we are lacking in a constructive program that looks some years into the future.

President Salisbury made his memorable report on the needs of the country schools just ten years ago, but we have thus far failed to realize on any of the things he advocated in that report. It appears to your legislative committee, that the time has come when we should reduce some of the suggestions made in that report, and in others made since that time, into tangible form, and submit them to the council of education of this association and the legislative committee, these to make recommendations to the association.

Your legislative committee desires to make the following recommendations as to the advance movements calculated to improve the elementary schools of the state:

1st, we urge a continuation of effort to secure the reform in the election of the county superintendent of schools, which will give us more effective and hence, better supervision of district schools.

The county superintendency measure, it is true, was defeated, but while we may regret its defeat it has its compensating features. It gives us additional time in which to perfect its provisions. It is a radical departure from the accepted traditional way of electing county superintendents. We have waited many years since Superintendent Searing first pointed out the inherent weakness in the system, before we formulated, as we think, a measure which goes to the root of the evil. But we can well afford to let the sun shine on this new plan a little longer, and meanwhile we can study the measure from every angle to avoid mistakes, and possible complications.

2nd, we urge the consolidation of country districts, and the elimination thereby of schools enrolling less than 16 pupils. According to Superintendent Cary's report, there are 97 schools in Wisconsin with an enrollment of 5 or less than 5 pupils. There are 380 that have an enrollment of more than 5 and less than 11. There are 701 schools with an enrollment of more than 11 but less than 16, thus making a total of 1,078 out of the 6,500 country schools having an enrollment of 15 or less pupils.

It needs no argument to prove the absurdity and wastefulness of a system of school organization that makes possible such small schools. The independent district system should be modified in such a way as to compel the consolidation of small schools.

3rd, we urge the organization of country high schools, whose work shall face the farm and not the city. State Superintendent Cary's report discusses fully the need of such schools. They would enable the older pupils to attend a high school without leaving the farm, and thus help in solving the problem of how to keep the boys on the farm, and make them better citizens and better farmers.

4th, we urge a better preparation on the part of teachers, which may result in a few years in demanding graduation from a county training school, or the course of study for country teachers offered by the normal schools, as preliminary training to teach in a country school.

5th, we urge a minimum salary law. The following tabulation of the conditions in regard to salaries paid to country teachers is a sad commentary on our present system of fixing the salaries of those teachers:

Salary per month.	No. of teachers.		Average yearly salary.	Average monthly salary (12 months per year).	Average daily sal ry (days per month).
	Men.	Women.			
Less than $20	.....	37	$162 00	$13 46	$ .52
$20 to $25	19	507	191 25	15 94	.62
$26 to $30	60	1,760	238 00	19 84	.77
$31 to $35	145	2,546	280 50	23 38	.91
$36 to $40	198	1,966	323 00	26 92	1.04
$41 to $45	168	1,222	365 50	30 46	1.17

In the above statistical table the numbers in bold faced type were taken from State Superintendent Cary's biennial report for 1906–1908, the others are deductions based on them.

An examination of the report, page 121, will show that there are 2,604 teachers not included in the above tabulation who received more than $46 per month. These teachers were not included because it was the intention to limit this inquiry as much as possible to salaries paid

to country teachers in the one department schools. There are 6,466 such one department schools in the state.

Some overlapping, however, was unavoidable. It will be seen that the above tabulation gives the salaries of 7,238 teachers. Eight hundred or more of these do not teach in country schools but like the 2,604 alluded to above they teach in graded schools and high schools located in villages and cities not having city superintendents of schools. It is only proper, however, to state that there are a number of teachers scattered throughout the counties of the state teaching in one department schools and receiving more than $46 per month for from eight to ten months. It was impossible to include these teachers in the tabulation.

The average yearly salary for each group of teachers was obtained by multiplying the average salary per month by 8½, the average number of months that school is taught in the rural districts.

In order to make comparisons between wages paid to country teachers and to wage earners in other occupations it was thought best to consider the salaries on the basis of twelve months per year and twenty-six working days per month.

Summary:

37	teachers work for	$162 per year or	$ .52	per day.
526	teachers work for	192 per year or	.62	per day.
1,820	teachers work for	238 per year or	.77	per day.
2,691	teachers work for	281 per year or	.90	per day.
2,164	teachers work for	323 per year or	1.04	per day.
1,390	teachers work for	366 per year or	1.17	per day.

Minimum wages paid country school teachers, 52 cents per day.

The certification measure which increases the educational qualifications of teachers, will undoubtedly have a tendency to increase salaries, but salaries paid to country teachers will never be commensurate with the character of the work demanded of them, because the law of supply and demand is not permitted to operate in regulating teachers' wages. Custom demands that county superintendents certificate a sufficient number of teachers to fill the schools, no matter, in the last analysis, *where they come from*, and district boards fix the salaries as they please.

We need a minimum salary law, which will place the salaries of country teachers and grade teachers, on a substantial basis, that will not only attract, but hold young men and women in the profession of teaching, a minimum salary law that will stop the withdrawal of young men from teaching. Therefore, when the time comes for pushing such a measure let it be one that approaches the salary schedule of Milwaukee, which now sets the pace in this matter in the state.

In Milwaukee the minimum salary paid to graduates of normal

schools, without experience, is $600. The maximum for experienced teachers in the grades is $1020.

Unless some minimum salary law is passed that will assure young men and women living wages, we cannot hope to see much improvement in rural schools. In the words of President Salisbury, "The country schools will not become better until more money is spent on them."

5th, we urge a more perfect organization to secure legislation to carry into effect needed educational reforms. Through the council of education and legislative committee, militant centers to push measures acted upon favorably, by this association, should be organized in every section of the state. Every agency that can help in shaping public opinion should be set in operation to secure that general uplift of elementary schools, which will place the Wisconsin system of education second to none in the world.

(Signed) C. E. PATZER,
Chairman.
JOHN CALLAHAN,
C. P. CARY,
P. J. ZIMMERS,
JOHN KELLEY.

EDUCATORS' RESPONSIBILITY FOR OUR VITAL STATISTICS.

DR. HELEN C. PUTNAM, Providence, R. I.

On a recent formal occasion it was my fortune to offer an answer to the question "What are American Characteristics?"

The answer was based on opinions of foreign critics and of our own; also on statistics—the United States Census and other authorities in fields which the Census does not include. While working it out the thought continually recurred: Whatever American characteristics are, educators and society at large are making them; and as education creates social standards, society creates its educational institutions.

Rather convincingly both literature and statistics arrive at similar conclusions. Briefly, the United States is famous for its vast accumulations of wealth and for its wastefulness of life, with both its disregard of law—civil laws and biologic laws.

Our national wealth, one hundred sixteen billion dollars, has for its nearest rival sixty-two billions. Our manufactures are one-third of the world's. We rival other nations in value of exports, of inventions; in vastness of business combinations and enterprises; in multi-millionaires, school population and buildings for educational purposes.

There is another significant rivalry: in societies for organizing charities, schools for training philanthropic workers, and in numbers and objects of organizations for social betterment. These are ominous of another side, our indifference to life.

When Chicago had its World's Fair, Paul Bourget came over to see, he says, how Democracy keeps her "promise of equality and fraternity through the imbecile tyranny of numbers." He promptly decided that the foundation of American character is "to beat the record;" that our business man is a technical genius to be found nowhere else.

Bryce, a friendly critic, emphasizes what many had commented on before, our superficiality. Our internal affairs need continuous scientific attention, he says, which they do not get; our political parties are not alive to principles, but cling to dead issues instead of working out our serious new problems. These "serious new problems" arise from the same conditions resulting in societies for organizing charities; the conditions alongside which greed for wealth and its powers have attained supreme magnitude.

In my necessarily superficial outline of some of these problems every educator, particularly those in primary and grammar grades and in normal colleges, should store in mind for further thought the question: What has been our error? What shall be our work for these lives?

If our business men are phenomenal, so are our hoboes; five hundred thousand tramps, mostly between twenty and fifty years of age, fifty-four per cent. native Americans, i. e., in our schools not long ago.

"In our schools." We have a school population of twenty-five millions. Only one in thirty is graduated from high school, eight hundred thousand; only one in three completes grammar school, eight millions; more than twelve million drop out in the five lower grades. Of those remaining a majority are in neglected subnormal conditions impeding progress. In little New England we have five thousand children between ten and fourteen who cannot read or write. In the United States we have one million wage earners between eight and fourteen.

Last year we had three hundred sixty thousand cases of typhoid, from human discharges in water supplies. Great Britain has almost none. Of other infections those due to the tubercle bacillus, *spirocheta pallida* and *diplococcus intra-cellularis* are almost entirely preventable; but selfishness, carelessness, and above all ignorance allow tens of millions to become their helpless victims, depreciating us as a nation. We do not yet care for life sufficiently to require health boards to protect us from these as from smallpox; nor to train, not talk about, but train pupils in those essentials of cleanliness and elementary science necessary to protect themselves.

In railway accidents the killed annually has doubled in ten years; injured trebled; dividends quadrupled. There have been nearly one million victims of railway accidents in these ten years. In 1907 nearly twelve thousand were killed, one-third being employees; over one hundred eleven thousand were injured, over one-half being employees.

The day I arrived at Salisbury two years ago chanced to be the day the English people uncovered with dignified ceremonial the tablet in their beautiful historic cathedral to the twenty-eight Americans killed in the boat train disaster the year before on their way from Plymouth to London; in regretful sympathy those twenty-eight American names are preserved on the stately cathedral walls—only twenty-eight. Until we, too, are mindful—mind full—of our ten thousand killed and hundred thousand maimed every year on the railways, the rotten old-fashioned tracks, the too long hours resulting in disordered nerves, the too few workmen will continue to quadruple dividends.

Since 1900 about twenty-six thousand coal miners, nearly seven thousand in one year, have been killed; accidents increasing here, decreasing abroad. Among all occupied males last year there were over thirty thousand fatal accidents, and two million non-fatal but involving future incapacity, shortened life, with other sorrow and suffering. The risk in America is one-third to one-half more than in other countries. It is well said that "our industrial slaughter completely overshadows the fatalities of any geat battle."

Many occupations increase mortality and morbidity by injurious dusts, vapors, temperatures and strains, that intelligence could eliminate. The occupation of teaching ranks among the three with largest death rate from tuberculosis.

Fancy in the schools of a later century statistics of killed and injured in today's battles for livelihood and wealth replacing little Marathon, Waterloo, Balaklava, and history commenting on this supremely murderous era.

We are burdened with the public support of a million insane, feeble minded, deaf, blind, paupers, and many are outside institutions; each wasted life because "some one had blundered." This burden is increasing, not decreasing.

The deaths of infants under one year have been estimated, from statistics in the few localities where infant deaths are recorded, to cost us annually nearly thirty-four million dollars. It is often spoken of as a holocaust. We know it is appalling, unforgivable; but we have not cared enough to have registration of births and infant deaths in order to get at facts and causes necessary for saving infant life.

We have no reliable statistics of crime, even of crimes against life. Standards and enforcement of laws vary too greatly. We saw last summer two criminals sentenced for life for stealing for a few days,

not otherwise harming, the little son of a wealthy man; and one hundred white slave traffickers, because of a legal technicality, released on American homes from short sentences, their crime being the greatest possible injury for life to thousands of our daughters. The vengeance of biologic and of pathologic law on the people with this standard is relentless. "The mills of the gods grind late, but they grind fine."

Of our approximately one hundred thousand prisoners, over one-half are sentenced for one year or less; the commonest offenses are drunkenness, disorderly conduct, vagrancy and crimes against chastity, i. e., indifference to life. Next come larcency, assault, burglary, i. e., greed and indifference to law. There is a larger proportion of native Americans than formerly. There are about eleven thousand convicted murderers. The annual average of murders during the last twenty years is said to be 6,597, in certain years rising to nearly eleven thousand. Our convictions are but 1.3 per one hundred crimes; in Germany convictions equal ninety-five in one hundred murders.

The President recently wrote: "It is not too much to say that the administration of criminal law in this country is a disgrace to civilization and that the prevalence of crime and fraud, which is greatly in excess of that in European countries, is due largely to the failure of the law and its administrators to bring criminals to justice." Back of the failure of law and its administrators are indifferent public standards, public standards which education does so much to form.

The period after our civil war was financially and in other ways one of our gloomiest. The present is one of our brightest if wonderful discoveries in science and their practical applications, if vast undertakings with great accumulations of capital are evidences of happiness. The suicide rate has been called a measure of society's mental and moral content. The rate of suicides from that darkest to this brightest era has steadily increased, especially since 1900. It has increased in Germany, Great Britain and other countries also; but theirs is much lower. Within fifty years there have been one hundred fifty thousand suicides; sixty thousand of these within ten years. Within fifty years there have been two million deaths by violence, over one-third within ten years. During this same fifty years we have seen smallpox, diphtheria, mortality from surgery and from some other dangers become much less, *under the control of science.* Before we can lessen we must first learn why the increase in suicides, preventable accidents, diseases of heart, kidney, lungs and brain and other devastations of the pallid spirochete and tubercle bacillus. Control through scientific knowledge seems necessary here, too.

For a minute let us glance at an indifference to life closely related to this indifference to human life. I refer to our extermination or almost extermination of countless hordes of buffalo, elk, bison, moose,

antelope; wild turkey, ruffled grouse, snipe, swan, passenger pigeons; seals, sea otter and other animal life; to our exhaustion of soil until some foreign countries more than double our crops per acre; to the waste of minerals, natural oil and gas by our methods of mining; to our loss of forests, of valuable woods; with a Water Power Trust planned on a billion dollar scale to control the water powers of the country that in the near future will be very valuable because of our improvident deforestation. It is a chapter in national development no one can speak of without profound indignation; the criminal and reckless greed with which men have wasted this fertile continent, our inheritance, the sustenance of unborn millions, the last great land open to modern civilization; selfishness on a scale paralleled nowhere in history, thanklessness for the bounty and defiance of the laws of Nature that must shorten human existence on this planet, as it already has begun to cripple it in necessities, and narrow it in natural beauties and scientific interest: "indifference to life and law."

Returning to social conditions—what of American homes? Why did Roosevelt appoint a Commission to investigate American homes? It brought in a voluminous report that makes us ask, "Should not education, right education, build better homes than these, with their aftermath of juvenile delinquency and adult failures?"

In the last twenty years there were about thirteen million marriages and one million divorces. The precentage of divorces increases about three times faster than the percentage of population. Adultery, intemperance and desertion, the commonest alleged causes, throw some light on the state of mind with which responsibilities of home making are undertaken by those who have been in our schools. Divorce is commonest among actors (one divorce to six marriages); next in order, among commercial travelers, musicians, office workers, bartenders and sailors, physicians, lawyers, clergymen and, rarest, those engaged in agricultural pursuits (one divorce in ninety-six marriages).

Yearly for one and a half billion gallons of alcoholic drinks one and a half billion dollars is spent, as is two hundred forty millions for tobacco and sixty-two millions for patent medicines, nearly two billion dollars all together, largely by poor men, for the direct agents of crime, vice, poverty, ill health—details in which we lead or rival other lands. It is more than twice as much as is spent for education.

Our saddest lack of foresight has been in the matter of children's environment. Street influences and dangers end or cripple lives and form their standards; American children have an international reputation for lawlessness and bad manners. In older countries, for example, fruit and flowers growing on public highways are unmolested. Here not infrequently it is difficult or impossible to grow them in

private grounds; adults chuckle over their own childish thieving, but this is a training for dishonesty in later life.

A few weeks ago I visited a school near a tenderloin precinct where the innocently expressed ambition of the little girls was to be a "fancy lady" and the little boys equally admired the prettily gowned ladies. I have just been in a city where the elegant new public library was knowingly erected ten years ago at the border of one of the tenderloins. The children's department is a convenient station for a policeman in citizen's clothes to watch for evidence of soliciting outside; young girls have been approached in the building; the toilet rooms have been closed, but only recently, for similar reasons. Meanwhile the public schools, and LL. D's, D. D's and Ph. D's on the boards of trustees ignore these facts and do all in their power to attract children to the building. Mothers are ignorant of them except when one hears her child's experiences.

Recently a prominent church sold its late pastor's elegant residence. It was at once opened as a fashionable house of ill fame. Of course they were sorry, but not to the point of expending their ill gotten funds to break up the educational successor of their pastor.

A very few years ago a committee of fifty distinguished gentlemen organized to clear vicious resorts out of their New England city. The press reports of their intentions abruptly ceased. Inquiry elicited the information that much of the real estate rented for brothels was owned by the "first families," the high rentals making them valuable investments. Owners of real estate largely control this educational environment of children. Societies of sanitary and moral prophylaxis organized in this new century are endeavoring to awaken educators and other Americans to the influence of such standards among those who were once in our schools on our vital statistics.

What is needed in the intelligence of the nation to stop this awful waste of life?

The figures are that our industrious agricultural population has the lowest rates of suicide, divorce, crime and other departures from the normal. One-fortieth of the population a century ago lived in the country. Radical change in environment has occurred by which more than one-third of us, in some localities one-half, are city born and bred—bodies, minds, morals grown between walls, on pavements, under electric lights, by clanging gongs and other racket, with human dusts and reeks, rule of police, morals of politics and commerce, inspirations from the press; the artificial, man-made everywhere, faulty, transitory, inanimate except for other men moulded by the same influences.

All is not bad in the city, nor good in the country; but when man eliminates nature the devastation threatens to be as bleak as when nature eliminates man. City advantages, chiefly commercial and

social, with the country's, chiefly health giving and soul restoring, are both essentials. Playing fields, not "concreted" and "equipped," but grassed and tree bordered, are a part, not all. Ample parks and a green for every house are a part; and free municipal transportation from business centres to suburban homes.

Back of the play fields, greens and suburban living, must be intelligence to develop the good in them. The scientist knows that life itself, not words about it, must be dealt with directly to learn its lesson; knows that ideas planted in the mind's most plastic years, when we give the smallest salaries and poorest school equipment, are the most enduring. We cannot see our way yet to giving all children a wholesome natural environment; but we can, if we will, at once give them direct contact with the healthful lessons of that environment. Our biologists and nature teachers are asking what is the philosophy of nature study. They must have one. Out of numberless phenomena on what principle shall they select for children? They have been aimless, too diffuse to be strong.

The philosophy of nature study, by which public consciousness may be stamped with correct appreciation of life's meaning and value, should be—I must use several terms all meaning one thing—heredity, parenthood, every cell from a cell, relationship, evolution, the oneness of all protoplasmic life, not each for himself but each inevitably a part of all, losing his life in all to find it in serving all. A child should learn as simply as he learns sunrisings and sunsettings, through all his awakening senses, that *each life is a trust received from many who have gone before, to be modified in his turn and passed along to many after.*

"But,' some one says, "isn't this a big idea for a child?" It is no bigger than the idea of God. It is parallel with the idea of God. It is capable of actual demonstration by competent teachers in the garden and laboratory with plant and animal life; even better in the country child's environment where it is the principle underlying the commonest phenomena around him.

While this unity of life, dominance of law, becomes a part of consciousness, he is learning life's details from his growing plants and animals, characteristics of protoplasmic life like his own from which city environment separates him. He comes in direct contact with phenomena and laws of reproduction, birth, death, under the scientific guide; modifications of environments and heredities, methods of growth, its enemies and friends. He learns to appreciate life in plants, animals, men, understanding its elemental phenomena, struggles with foes and survival through primeval forces of which his own powers are part. What one is ignorant of one is usually careless of and wastes as our country is doing.

Especially is he trained in truthfulness. Truth is not easy. There is no training for the child comparable to this in searching for truth, seeing it correctly, and reporting it accurately. It is a fact noted by teachers of biologic branches that pupils rapidly develop in thoughtfulness, steadiness, reliability and respect for the property and rights of others.

This central idea, a trust received to pass along, in the study of living things in the grades and high school, offers a logical and safe—almost the only logical and safe—opportunity in public education to guide the people away from ignorant sex traditions resulting in vice and degeneracy; to substitute knowledge of biologic laws of home making; to satisfy a normal childish curiosity, which thwarted and misinformed results in destruction of life, by correct information the foundation of correct living.*

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* Our normal schools are negligent—I should like to say criminally so—like physicians—omitting not only instruction for their pupils as men and women, but instruction necessary to protect children entrusted to their care from each other's evil and to develop a right moral sense. I have found but two normal courses of value in this direction; one in a private, the other in a public institution. In the private school, as part of the course in hygiene, only the necessary physiology and anatomy are given. By *papier-mache* models of pelvic viscera and of various stages of impregnated ova humane production is taught. This is followed by a week's lectures by a medical woman on sex functions, pregnancy, childbirth, the development of the child, social diseases. The regular instructor afterwards takes them to institutions where infants and other victims illustrating heredity and degeneracy can be seen.

In one state normal college where there is a very excellent laboratory course in biology (Ypsilanti), a supplementary course in "special physiology" for women is as follows: 1. Principles of reproduction in the life histories of algae and protozoa; fern and colenterates; corn, lily, frog. 2. Detailed study with demonstrations of the development of the chick. 3. Discussion of meaning of sex, heredity, marriage. 4. Development of sex organs of rabbit; comparative study of reproductive organs from monotremes to man. 5. Anatomy, physiology and hygiene of human productive organs. 6. Puberty, adolescence, menopause. 7. Social diseases. 8. Educational problems connected with sex. How to teach children.

This course is apparently a great success. The teacher is a woman. The male normal pupils are not getting the instruction.

References: The Eighth Year Book of the National Society for the Scientific Study of Education: Education with Reference to Sex. In two parts. Address University of Chicago Press. (2) American Society of Sanitary and Moral Prophylaxis: Educational Pamphlets; No. 1, The Young Man's Problem; No. 2, For Teachers; No. 3, The Relations of Social Diseases with Marriage; No. 4, The Boy Problem. Address Dr. E. L. Keyes, Jr., 109 E. 34th St., New York. (3) The Social Evil with Special Reference to Conditions Existing in the City of New York; A Report Prepared under the Direction of the Committee of Fifteen. Putnam's Sons, New York. (4) Studies of the Teaching of Hygiene through Domestic Science and Nature

This central idea in studying plants and animals—a trust received from many to be passed to many—impresses what is now so grievously lacking, responsibility. The best developer of manhood and womanhood is a trust. And a little child loves to be trusted, loves responsibilities according to his strength.

I am not given to quoting poetry in addresses; but just after writing these words I picked up the Eevcning Bulletin and found Kipling's "Recall," from his new volume "Actions and Reactions." It means so exactly a large part of what I mean that I pass it along.

I am the land of their fathers,
In me the virtue stays;
I will bring back my children
After certain days.

Under their feet in the grasses
My clinging magic runs,
They shall return as strangers,
They shall remain as sons.

Over their heads in the branches
Of their new-bought ancient trees,
I weave the incantation
And draw them to my knees.

Scent of smoke in the evening,
Smell of rain in the night,
The hours, the days and the seasons,
Order their souls aright;

Till I make plain the meaning
Of all my thousand years—
Till I fill their hearts with knowledge,
While I fill their eyes with tears.

I like all but the last line, we have tears enough in city life. I wish it might read:

Till I fill their hearts with knowledge
Of the trust of life that endears.

In readapting schools to twentieth century needs, school gardens and domestic science (the science of making homes)—both welcomed

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Study; Section II of the Report of the Committee to Investigate the Teaching of Hygiene in Public Schools. Address Dr. Charles McIntire, Secretary, American Academy of Medicine, Easton, Pa. (5) Practicability of Instruction in the Physiology and Hygiene of Sex as Demonstrated in Several Public Schools. Dr. Helen C. Putnam. Boston Medical and Surgical Journal, January 31, 1907.

in some cities as industrial training—should be regarded by those at the helm (as they are in cities where the best work is done) as pre-eminently avenues for practically impressing scientific truths concerning phenomena and laws of life; bringing our people to recognition of forces that cannot be flouted like those city dwellers are chiefly acquainted with—rule of parents, police and other city fathers.

The obstacles are not with the children, nor with the teachers. They are with those training teachers, and administering schools.

They would be most quickly overcome if those alumnae alive to our "serious new problems" would concentrate on their respective *alma maters* their strongest influence to introduce laboratory courses covering the essentials of sociology and biology, as the foundation for influencing, training, informing children in life standards.

With children of seventh grade and older all teachers are not temperamentally fitted to work in the true biologic spirit, although they may surpass in other directions. By far the best work seen in studying many schools here and in England has been by departmental teachers, both in domestic science and in biologic science.

One of the delusions hampering many is that the understanding of elementary life events is more difficult than dealing with artificial man-made matters, books and their contents, tools and machines, vice and its education.

My vivid impression after seeing scores of teachers at work is that the essential life phenomena, interpreted by competent instructors, are always fascinating to the child mind so often starved into mistakes by artificial pabulum. Their whole attitude becomes finer as intelligence grows along the eternal laws they are tracing. One most encouraging result is the clearing up of the faces of the unclean minded children. Furtive smiles give place to open countenances and earnest manner.

The path of evolution in the Maker's work logically seems to be the path by which finite minds—specially when smirched by ignorant tradition—can normally (wholesomely) travel toward Truth, reverence for Law and understanding of Life's meaning. This is educators' responsibility to the twentieth century's "serious new problems;" to give a larger vision beyond finance; through scientific knowledge of the wholesome facts of life to create a higher valuation or the Trust of Life.

THE PLAYGROUND MOVEMENT OF TODAY.

By HENRY S. CURTIS, Ph. D., of the Playground Association of America.

In the summer of 1907 there were in this country ninety cities maintaining playgrounds: in the summer of 1908, 195; in the summer of 1909, 275. Perhaps no other social movement has made such rapid progress, but it has sprung from unusual conditions.

Few people realize how unnatural have been the conditions under which the children of the cities have been living during the last few decades. For the normal development of the play life of the child there must be space, things to play with, companions, and leadership. To secure skill there must also be social encouragement on the part of the community. All of these conditions have been almost at their lowest ebb in America during the last fifty years. There has been almost no space; there have been few of those natural objects such as brooks and meadows and forests and animals which stimulate the child's mind and lead him to a varied activity; comradeship which is essential to any high development of play, has been impossible in a large sense on account of the heterogenous population of our lower cities with its differences of race, religion, and political creed, all of which militate against close friendship. For the same reasons, leadership has been much more difficult. There has been no encouragement on the part of the community, which has commonly confused play with idleness. The streets have been dangerous, and games have not been taught as formerly either by the mothers or by other children. Play is instinctive, but games must be learned the same as any other accomplishment. These are ordinarily handed down by the social traditions of the community. But when we have a community made up of many races there is no common social tradition.

We often hear the play movement spoken of as a fad, and comparatively few even of those interested in the movement realize that it is as vigorous abroad as in this country. Whilst the play movement really springs from everything that has to do with the study of the child, and is an inevitable outcome of the new psychology and the new interest in childhood, it may be said to find its most important beginning in the sand gardens of Berlin in 1885. The Central Committee for the Encouragement of Child and Adult Play was formed in 1891, and has had a very great influence in the development of the movement throughout the Empire. In 1892 a special commission was sent to England to investigate the sports in the English public schools. This commission made a very favorable report on what it found there, and resulted in English teams of football and cricket being invited to

make tours of the German cities and play exhibition games. The Central Committee sought to have these games introduced into the High Schools, Turnvereins and athletic associations. With customary German thoroughness, they organized the games of the elementary schools into a curriculum of play with a certain number of required games for each grade; and almost immediately they began to give courses in play to the teachers in order to prepare them to take charge of these play periods. The Biennial Congresses and Play Festivals of the Central Committee served to focus the popular attention upon the work being done. In very many cities one or more afternoons each week are given to directed play, at which the attendance of both teachers and pupils is required. The number of schools having this compulsory play period doubled last year. Courses in play were given to the teachers in 67 different cities of Germany during 1908.

The type of English school of which we probably have heard most is the one which they call the secondary school. It consists of a preparatory school, the public school and the university. All of them are for the "sons of gentlemen."

Gentleman is really a title in England. You probably have all heard the story of the Englishman who was speaking with an American girl and said: "I wonder that you have no gentlemen in America,—men who don't work, you know." The good American girl is said to have replied, "Oh, yes, we have many such, but we call them tramps over here!" I was once seeking for the Westminster School, and asked a very well dressed boy if he could direct me. He replied that he was going that way and would be glad to show me. I said, "Do you attend that school?" He said, "Oh, no,—that is for the sons of gentlemen." I said, "Isn't your father a gentleman?" "Oh, no," he replied, "my father is a carpenter." In America a man may be both a carpenter and a gentleman, but it is not so in England.

The lowest grade of these schools for the sons of gentlemen is known as the Preparatory School. It was once a part of the public school. Boys come at the age of 9 or 10, and remain until they are 13 or 14. Nearly all of them are situated in the country, and most of them have large enough grounds, so that all of the boys can play at once. Practically all are boarding schools. Football is compulsory for from 12 to 20 hours a week, from the beginning of school until about the 1st of May, and cricket for the balance of the year. The Masters spend on an average about two hours a day in playing with the boys. Nearly all the games are between the dormitories and classes of the school, there being very few outside games; and there are almost no accidents.

In the Public School, which is really a very expensive private school,

games are also compulsory for about the same number of hours, but in this case the requirement is enforced by the boys in the 6th form, and it is really a rule of the student body rather than of the school itself; but it is just as effective, and punishment is meted out to the boy who neglects football practice as promptly as it would be for any other infringement of the regulations.

In the High Schools for Girls, which correspond to the Public School, games are also compulsory for about the same length of time. This usually means tennis, hockey and golf; but in nearly half of the schools cricket is required.

In the Board Schools, which correspond to our public schools, much less ideal conditions prevail, as these are located in the cities where sufficient ground cannot well be secured. But the new law of London requires 30 square feet of playground for each child in connection with the school, and in practice it is usually 40. Children in the upper classes are taught to swim in the public swimming pools.

School playgrounds are open every afternoon until dark, and many schools have also out-of-town playgrounds, where the children go for their half holidays. The English Elementary Code of 1906 provides that wherever suitable provision can be made for organized play, the afternoon session of the elementary school may be omitted. The teachers probably do not give as much time to organizing athletics as they do in the Secondary Schools, but they give far more than the American teacher has ever done.

Municipal playgrounds are common throughout Great Britain, but are usually in charge of care-takers and can be ranked only as second rate playgrounds.

The Playground movement in this country has been begun in nearly every case through private initiative. A Mothers' Club, A Civic Club or some other private organization begins an agitation. A school loans its yard, a sand dealer gives the sand, a lumberman furnishes the lumber, and a kindergartner contributes her time; and so the movement has been carried on for four or five weeks during the summer vacation, as the first step in most cities.

The next step is usually the organization of a Playground Association. These associations have become almost universal in our larger cities during the last three or four years. Being composed of very influential citizens, they have been effective in securing appropriations from the city and in raising money from private sources. But perhaps more important than this, they are keeping the movement out of politics, which is its great danger, and seeing to its systematic development according to some more or less developed plan.

The Playground Association of America was organized in Washington in the spring of 1906, and has exercised a large influence on the development of the movement. Its play festival in Chicago in 1907

has resulted in play festivals in nearly all the other large cities. The work of its committee on State Laws resulted in the Massachusetts Playground law, and its Committee on a Normal Course in Play has made a report which is putting the whole work on a more intelligent basis. The Playground Association does not operate playgrounds. It is a purely propaganda body. It furnishes literature, information, latern slides, or lecturers, to communities in need of these facilities, and through its various committees it is guiding the ideals of the movement.

The Sage Extension Committee was organized in the fall of 1907 as a department of the Russell Sage Foundation, and it has been spending about $25,000 a year in the general promotion of the movement. It employes a director, Dr. Gulick, a field secretary, Mr. Hammer.

The most notable movement during the last few years, however, has been the tendency for the cities to take over the work and conduct it as regular municipal activity. Six years ago probably not more than 10 per cent of the playgrounds received public funds. Now probably 50 per cent or more are wholly or in part supported in this way. This means much for the movement because it places at its command very much larger sums of money than were ever at its disposal before. Chicago has spent some $11,000,000 during the last five years in the development of its playground system.

In 1907 New Jersey passed a law authorizing mayors of the different cities to appoint playground commissions which should acquire the land, purchase the equipment, and provide supervision for systems of playgrounds. In 1908 Massachusetts passed a law requiring every city of 10,000 inhabitants to vote whether or not it would maintain playgrounds. Thus far 42 cities have voted, and 40 have voted "yes" with a majority of about 5 to 1. During the past year Ohio, Indiana and Minnesota have passed playground laws usually with such large majorities that it would seem to indicate that such laws may be expected in the near future in all of our northern states.

Along with this increase in number of cities maintaining playgrounds there has come a general extension of the time during which they are conducted; from a term of 5 or 6 weeks during the summer vacation, municipal playgrounds are now coming to be maintained during the entire year, and the school playgrounds during the summer and the beginning and the end of the school year. Through lighting at night, many of the playgrounds are making provision for the working boy and girl as well as the smaller children. Quite contrary to the general expectation, the attendance is increasing all over the country, even in playgrounds that have been open for several years: and each year sees the addition of new features, such as outdoor gymnasiums, swimming pools and field houses.

But perhaps more important than this increase in extension of the movement, has been its increase in intention. In the first place the playground was regarded everywhere as a "place to play," and this was the rallying call of the promoters: but it was soon found that place to play was not sufficient, that the vacant lot provided was far less attractive to the children than the streets and alleys and railroad yards where there was always something going on. The children did not come.

The next thought was, equipment. We must furnish these grounds with ample apparatus, and the more apparatus we have, the better playgrounds they will be. But playgrounds of this character were so noisy and disorderly as to become a public nuisance. They became the places where the street gang and the corner loafers impressed their ideals upon the younger children. And several such playgrounds were closed by public injunctions.

The playground movement throughout the world stands for directed or, better, organized play. By which we do not mean bossed play. The play leader is not a foreman who says, "Jennie, you go over here and play tag; and, Mary, you go over there and play hop-scotch," and similar things. At all large summer hotels there is some one whose business it is to organize the amusements of the adults. The children are no more capable in these matters than their fathers and mothers. Whilst children left to themselves, will play something, they are just as apt to play jackstraws or craps as baseball or tennis; and, while a certain number of boys will, of their own accord, play on baseball teams, this is always a small per cent, and for the most part these teams are not permanent and consequently do not secure loyalty or efficient training. The girls are not apt to play anything of any considerable development value. If anyone will watch a hundred children by themselves in a school yard or vacant lot, as a rule they will not find over 10 per cent of them doing anything that is worth while.

We are coming to see that the health of children is very largely dependent upon their leading a life in the open air. In order to secure this, we must make out doors attractive to them, and the teacher is the largest element in this result. Children are getting their physical development almost altogether from their play. Work of city children has disappeared, and the physical training, occupying very little time, is usually a mere incident. Now the physical development which the child gets from unorganized play is of a very low and unequal sort, but with proper organization it may become the very best possible type. Mere bulk of muscle has ceased to be important to civilized man, but in whatever position a man may be placed, strength of heart, lungs and digestion are of vital importance; and it is just

this kind of training which play alone can give. Practically all games involve running, and the large muscles of the legs and trunk, and thus quicken and strengthen at once the action of the heart and lungs and tone up the stomach.

We often hear people speak of teaching men to be honest in business. But men do not learn to be honest in business. If the child grows up to cheat every day in croquet and basket ball and in other games he plays, these habits become fixed long before he goes to work, and the chance of his becoming an honest man in business affairs is very slight. In the same way, we might consider every other habit which the child forms, and in practically all we should find its most vital expression is in what is to him his most real life, that is, his play. Through the team game we have the easiest initiation of the child into habits of unselfishness. Loyalty to the team means to the child what loyalty to the city and the state mean to the citizen. The boy who has learned to come out and practice when he wants to do something else, to strike out in order that the other boy may score, to take the undesirable position, and forego the grand-stand play in order that the team may win, has gained the most vital education in good citizenship which it is possible for him to secure.

The great difficulty with the play movement in this country has been that there has been no one who has been fitted to take charge of the playgrounds, either through spontaneous interest or systematic training. And the playground can never be a higher force in the community than the ideals of the people in charge. We cannot change the corner loafing ground into a social force in the community by merely christening it a playground. The new Normal Course in Play recently issued by the Playground Association of America has come to fill a great need in the whole situation.

The course is divided into three parts. The first of these is a course for professional directors. It contains elements such as are found in schools of physical training, kindergarten schools and schools of philanthropy, with a special technique of its own. It is expected that it will take at least two years to complete this course.

The second course is an institute course. It is intended for the training of those who go into the work temporarily for the summer time.

The third course is a course for teachers. It it intended for introduction into Normal Schools and to be given to regular teachers. The committee recommends, 1st, that children's games be taught as a part of the regular work in physical training, throughout the normal course; 2nd, that a playground be provided in connection with the practice school and that a certain part of the practice teaching be taken in the playground; 3rd, that all teachers be given a certain

minimum training through special lectures or otherwise in the general pedagogy of play.

The reasons for these recommendations are: 1st, play is the most fundamental expression of the child's nature, and it is only through play that the teacher comes to understand the child; 2nd, growing out of play relationships comes a kinder and more effective discipline, and a strength of personal influence which does not otherwise develop; 3rd, that playgrounds are coming to be provided in connection with many schools and there is a large and increasing demand for teachers to have charge of these during summer vacations and more or less after school; 4th, that play has already become a school subject far more important than any other subject in the curriculum, taking as much as 20 hours a week in some systems and making increasing demand for time in all systems throughout the world. Boston has dropped the afternoon session of the elementary school in 100 class rooms and put organized play in its place, with a view of doing this in the other classes when they have the work properly organized. New York is requiring rather more than an hour a day of organized play in the lower grades, and the tendency to make greater requirements in this direction is general.

Numerous studies in schools widely scattered seem to show that a half day during the lower grades given to scholastic work secures at once nearly as great scholastic results as a full day and gives a far better training, so that the children on the half time, provided they have fresh teachers, often outstrip before the end of their course, children who have spent five hours a day on the work of the elementary school.

There seems to be a general feeling that the number of physical defects and ailments increase with the progress of the school year, that vitality is lowered, that children become more nervous or otherwise debilitated. If it is really true, as it seems to be, that all of this is unnecessary, and the children are getting no real return out of this extra half day in which they might have become strong and well and social in tendencies through organized play, then the binding of this extra burden on the backs of the children is no less than wicked.

Dr. Curtis here presented numerous slides showing the development of the playground movement.

COUNTRY LIFE AND COUNTRY SCHOOLS.

FASSETT A. COTTON, La Crosse.

The great educational problem of the country school is the one of the relation of country schools to country life, and as yet few have realized its stupendous importance. Upon its solution depends in large measure the future welfare and stability of our people. This is no idle statement. A study of the factors involved will show that it is true. To arrive at conclusions of any value at least three phases of country life must be studied:

1. The material and commercial progress.
2. Social life in the country.
3. The country schools.
   (a) The consolidated school.
   (b) The district school.
   (c) The school the center of social life.

A consideration of these phases makes necessary the consideration of two others, namely,

4. The training of teachers.
5. The salaries of country school teachers.

1. Material and Commercial Progress.

The change in farming methods is one of the marvels of the century. With forests cleared and swamp lands redeemed, the steam plow does the work of many men. The soil is prepared by machinery, planted by machinery, cultivated by machinery, and the harvest is gathered by machinery. The sickle, the scythe, the cradle, and the flail have given way to the mower, the self-binder and header, and the steam thresher. The dairy, from milking to butter making, has become scientific. Chicken raising and stock growing have become matters of intelligence instead of chance. Good roads, steam railways, interurbans, rural routes, and telephones have all but eliminated time and distance and have brought the farm in close touch with everyday life in the commercial world. Easy transportation and the knowledge of market prices have brought the farmer a fair return for his products. While this progressive spirit has in a way touched all farm life, this does not by any means tell the whole story.

It is still a far cry from the small hill country farm to the wide western plains where farming is done on so large a scale. The difference between what may be called domestic farming and commercial farming is tremendous. It is the difference between a small farm owned and occupied and cultivated by the owner for a living, and the landed estate owned by a syndicate or a wealthy individual and

farmed for commerce. More and more as the years come and go must millions of our people get their living from the land; and more and more must domestic farming become a dominant factor in the life of our people.

It is with this phase of farming rather than with commercial farming on a large scale that this discussion has to deal, and it involves at once the questions of social life and education of the family. After all, it is the family that lives on the farm that makes the problem an interesting one.

2. Social Life in the Country.

Before any reliable conclusions can be reached, certain mistaken notions must be corrected. Doubtless the stories of farming by machinery and the great results of commercial farming are responsible for these. To the unthinking, farming has come to be one long holiday picnic when everybody rides. Nothing can be farther from the truth. Even with the most approved machinery there is plenty of work for head and hand on the farm; and when it is realized that the use of all this up-to-date machinery is by no means general, and, more than that, that its use would be impossible on small broken or hilly farms, it will be apparent that there is still work to do. Moreover, the present adjustment of industrial conditions makes it almost impossible for farmers in many localities to secure help in their busy seasons, and the burden at times is heavy. Add to this that *much farming is still unscientific and extensive instead of scientific and intensive* and the real conditions may in a measure be understood.

It looks as though the same forces that brought farm life into touch with the commercial world might easily bring it in touch with the social world; that they might make possible the pleasures, comforts, luxury and culture of city life with none of its unpleasant features. But it must be admitted that this possibility has not been very generally realized. In many instances the social life of the people has not kept pace with material prosperity. Big barns filled with grain, wide fields over which blooded stock roams, and the latest farm machinery have often kept the dwelling house small and barren enough of comfort and beauty. Often the farm home that has taken on pretentious external dimensions is cheerless and comfortless within. The hard work and drudgery incident to successful farming, distributed as it is to all the members of the household, and the isolated mode of life that farmers live, are not conductive to social progress.

And so it may be fairly stated that the home interests have not always kept pace with the material interests of the farm. The

mothers and daughters who have borne their share of the burden of toil have been the larger sufferers. Under existing conditions it is not strange that farmers' children are attracted to city life and that they leave the farm. Life is too hard and the social advantages are too few and far between. It has been suggested that the custom of European farmers who live in villages would solve the problem. It is thought that such local centers would relieve the isolation and furnish the much-needed social life.

3. The Country School.

The real solution of the problem in this country lies in the coöperation of economic, social and educational forces with the school as the center. There is a vital relation between country life and the country school which has not been seen. The country school has not even begun to fulfill its mission, for the simple reason that there has in fact been no country school. Hitherto all schools have been alike,—city, country and town. Their province has not been to educate, to develop boys and girls into men and women, but to impart unrelated facts of arithmetic, geography and history. The country has had such schools, but they have never recognized their distinctive environment or let it make any difference in their mode of procedure. They have never realized that their problem is a distinct one nor that the means are peculiar. The farmers could not solve the problem; they have their own work to do, and it is not their business. And educators have worshiped tradition so long that it has been almost impossible for them to look fairly and squarely at the nature, conditions, environment and needs of a child and let these determine the process and means of education.

a. Factors Involved in Planning Work.

In order that we may see a little more clearly the relation between country life and the country school, and something more definite concerning the nature of the work of the country school in this relation, it will be necessary for us briefly to state some of the determining factors in planning the work for the children. These are: (1) the nature of the child, (2) the environment of the child, and (3) the probable life-work of the child. These are, indeed, important principles underlying the construction of the course of study and should help to determine just how subjects should be presented to the children in any community.

1. The Nature of the Child.

The child's nature is two-fold—physical and spiritual. Both phases must be provided for in the course of study. On the physical side the ends sought are health, strength and grace. Play, systematic

physical training, and constructive hand work suggest themselves as the simplest means for realizing these ends. On the spiritual side the ends sought are (a) clear thinking, (b) appreciation of beauty, and (c) self-control. The products of race-consciousness in each of these phases readily offer themselves as the simplest and best means for developing the individual consciousness in the corresponding phases. There is the world of science for the intellect to feed upon; there are masterpieces of art for the development of the aesthetic, and the vast field of constructive work for the cultivation of the artistic; while, for ideals and conduct, there are the world's heroes in the history of life in the past and the abundant concrete life of the present. Surely there is no room for caprice or accident in constructing a course of study.

(2) The Child's Environment.

So far the discussion might apply to children anywhere and under any conditions. Every child is physical. Every child knows, feels and wills. But every child has a world of his own, built up out of his own concrete, every day experience, and it is this world of his that must serve as his basis of interpretation. Only through his own eyes can he see. For the town or city child there is one set of experiences, one world; and for the country child there is another quite different. The course of study in its construction and presentation must recognize this difference, especially since traditional education everywhere has the city life trend. It must be remembered that for the town there is one set of problems, and for the country there is another, each determined by the peculiar environment.

There is, then, a town problem in teaching and there is a country problem. This problem is concrete and particular, not abstract. There must be country reading, country arithmetic and country geography. Each subject must be cast in terms of the child's life. The course of study and its subjects must be adjusted to the life of the community. The work in Wisconsin, for example, is absolutely different from the work in Texas. The life, the manners and customs, the climatic differences, the expressions of the people,—everything must be taken into consideration by the teacher. Moreover the work in different parts of Wisconsin must vary according to the differences in the life of the people. The work in town and country must vary in the same way. Indeed, no two communities near or remote can be treated exactly alike. The teacher must study the conditions, interests and modes of life in his community and teach his subjects in the light of these. The reading lessons must appeal to the children and must in a sense be taken from the life of the children. The arithmetic must be made concrete; the problems must appeal to the common

interest. The geography must begin at the school house and must deal with the earth forms in the community, since the child can interpret only in terms of his own experience. The dominant industry or interest must largely determine the mode of procedure. The particular phase of agriculture, of forestry, of orcharding, of stock raising, of lumbering, of mining, of manufacturing, upon which the material welfare of the people depends will furnish the data for all subjects, the language for expression, and the basis for interpreting the subject matter of the text. And so the community life must enter into the country school problem; and the teacher who would solve this problem must live in the community and become familiar with its life.

(b) The Consolidated School.

With the school as the center of township life and with its work based upon the principles heretofore set forth, the economic, social and educational interests can work out the solution together. In the nature of the case most farmers must live on their farms. Those whose circumstances would permit could build their homes in the school center vicinity, but the school must be the center.

The teachers should be well prepared men and women, thoroughly in touch with the problems and interests of the township, and permanent residents of the community. They should understand the relation of education and agriculture, and should be able to create in the boys and girls a love for the land. Good roads from every direction will center here, and convenience would shortly locate all residences upon these direct lines. Of course, the natural conditions of the township must determine the center, or the centers, for hills, and size of the township, and streams, may make more than one center necessary.

The central school should have a kindergarten, the eight grades, and a high school with a four years' course. It should have complete, well-equipped, modern buildings. Here should be located the township library, which should contain books well selected to meet the needs of the community, and which should have arrangements for distributing books by means of the transportation hacks and the free delivery mail system. It should have a small farm, well equipped for scientific, elementary agriculture. On this farm should be located a cottage for the principal and his family. The principal should have charge of manual training, including shop work in wood and iron, and agriculture and work in cement for the boys. The assistant should be a woman who should have charge of the manual training work, including cooking, sewing and household economics for the girls.

(1) The School the Center of Social Life.

With competent teachers and an enlarged community in the townships with consolidation—teachers such as our normal and county training schools under our present system ought soon to provide—interest in educational affairs would grow rapidly. The school would in fact become the center of the social life of the community. The citizens would have a meeting place to discuss every phase of life—agriculture, education, religion, politics. There, provision would be made for good lectures, the best music, etc. In their daily work the best teachers would bind together the interests of school and community. They would use their knowledge of country life in their school work. The boy would find himself and his farm experience in every lesson assigned.

These teachers, both in the consolidated and the district schools, having been thoroughly prepared, would know the nature of the soil and could show the practical value to the farmer of a knowledge of chemistry. In the high school they would be able to direct work in elementary agriculture and to turn a study of this industry to account both in and out of school. In the grade work and in the district school it would serve as illustrative material in nearly every subject taught, and would be the means of adjusting the education of the head and in country life, education. It would help the teacher to work all the surplus energy of childhood into education.

Out of school it would furnish the very best opportunity for work in the community. Corn clubs for the boys, cooking and sewing clubs for the girls, agricultural societies for the parents—these would give the teacher a chance to get into the lives of the people. Once started, such work would become an endless chain, for the reason that the pupils of this generation are to be the parents and teachers of the next. The work would be educative in an exceedingly practical sense. Parents would readily put themselves behind a movement of this character that promises so much for their children, and will demand its continuance and enlargement, regardless of cost. The children themselves, when once shown that it takes brains to farm, and that the returns are substantial, and the work dignified, would more and more decide to prepare thoroughly to do the work of the farm. They would soom be taught that farming is the fundamental industry in this country, and that honorable, comfortable competencies await the intelligent tiller of the soil.

(2) The Probable Life-Work of the Child.
(See (1) and (2) under "a" above.)

There remains a third determining factor in the planning of the work of the school. Without doubt the environment of the child with

its dominant industry in a large percentage of cases determines the life work. Certainly, therefore, common sense would dictate the course the school is to pursue in regard to the possible future vocation of the child. The very least it can do is to maintain an attitude of respect toward the calling, but it can and it should do more. Education ought to dignify and ennoble the dominant industry, whatever it is. It ought to lighten the burden of toil by making intelligent skill its ally. Instead of making the boy despise the calling of his father it should help him bring to that calling intelligent application that would jut it upon a higher plane. The chances are that the boy will have to work, and that he will probably have to work with his hands. He should, therefore, understand some industry and should be taught to work in it skillfully. Why not use the industry that most nearly concerns him? This he can understand. The essential thing is that he be taught to work and that skillful work is ennobling.

One result of such work in the school would be to induce the boy to remain on the farm or take up the industry of his father and so begin early an earnest, settled mode of life. As our country grows older the chances for successful haphazard careers will grow fewer and the necessity for preparing to do some definite work in life will become more apparent. The school, of all the institutions must direct the boys and girls in the work they are to do.

(4) The Training of Teachers.

Work of the character set forth in the foregoing paragraphs will require better preparation on the part of the teacher. However, in requiring additional preparation the changes should come in such way as to be fair to all interests. There are in Wisconsin thousands of conscientious, hard-working, successful teachers, who have done the best they could under the prevailing conditions. These should not be made to suffer by any change in laws affecting the qualifications of teachers, but should be given an opportunity to adjust themselves to any new conditions imposed.

For all new teachers entering the profession after a given date, however, something larger and more definite should be demanded. School officials might be empowered to set a date after which no new teacher would be employed who does not meet these new conditions.

a. The Minimum Qualifications for the Country School Teacher.

The country school teacher should have scholarship equivalent to that of a standard high school graduate, and at least one year of professional training, with special reference to country school work, including observation and practice teaching in a model country training school. After completing a two-year country school course,

worked out in harmony with the needs of country schools, the high school graduate should be granted a life certificate limited to the country schools.

5. The Salaries of Teachers.

Of course, better preparation should carry with it better salaries. What is a fair compensation for the teacher with the preparation mentioned? To begin with, every teacher should have comfortable living wages. In addition, he should have enough to reimburse his expenditures in preparation. There should be sufficient salary to enable him to travel some and to buy the books and apparatus necessary to carry on his work. It should be possible for him to put by a small sum every year for the time when he can no longer teach. He should receive full pay while off duty on account of sickness. If any abuse this just privilege it is better to rid the calling of such offenders than to make the innocent suffer. The teacher should of course have his annual vacation and every few years should have a part of the year off on half pay for rest, recreation, investigation and added preparation.

a. A Just Recompense.

The teacher who makes preparation in harmony with these suggestions and who enters the calling for life should have a salary that would offer inducements to the best men and women in the state to enter the country schools and remain in them. A teacher with such preparation, who gives evidence of ability after a successful experience of at least three years, should receive a salary of not less than six hundred dollars a year. After this, the salary should be increased rapidly, with increased experience and additional preparation, until one thousand dollars is reached. Under these conditions it is fair to suppose that more competent men and women would choose country school teaching as their life work and would make the preparation necessary to do work of the highest grade. There is no doubt that under such conditions the schools in the country everywhere would do vastly better work. Indeed, it is only under such conditions that we can hope to meet the new demands of education.

It is probable that the public would consider it a joke to talk about teachers living as well as other people. But why is not this the proper basis? Teaching is difficult work; it takes skill, brains and vitality. Why should it not bring as much as writing briefs, or dispensing medicine or selling dry goods? Why, indeed? Simply because teachers have not demanded it. The remarkable thing about it all is that we have gone on all these years with such miserable

pittances for salaries and have accepted them like so much charity. Teaching has, as Doctor Van Dyke recently said, been the poorest paid and the best rewarded of all callings, but we have come to a time when more pay will not affect the reward.

b. Reasons for Low Salaries.

The salary that the teacher receives represents the community's estimate of the value of the school to the community. In order to secure the best salaries it will be necessary for us to show the reasons for such a judgment on the part of the people. *First*, as a rule they exalt material things and depreciate spiritual things. They generally use good judgment in their business transactions; they want the best lawyer to look after their moneyed interests; they choose the best physician for their family; but somehow they continue in the notion that just anybody can teach school. *Second*, the proper relation does not always exist between teacher and patrons. The teacher does not always know the people and hence is not the power he should be in the community. For this condition the teacher is directly responsible. On the other hand, the patron is frequently uninformed concerning good schools and as a result correspondingly uninterested in them. He often fails to cultivate the acquaintance of the teacher. For this condition the patron is responsible. If patron and teacher would only take the trouble to get acquainted they would be surprised to see how mutually helpful they could be.

c. Lack of Revenue.

It is often stated that the salaries of teachers are as high as the revenue will permit. But why is the revenue so limited? The answer is again that men are not convinced of the large merits of education. All men everywhere should pay school taxes willingly; the man with children, that his children may be educated; the man with no children, that the children of his poorer neighbor may be educated, his own property protected and peace preserved. The man of wealth often does not seem to appreciate the close relation existing between freedom and free schools; between the safety of his property and an educated citizenship. He does not see that the more school tax he pays, the less he will be taxed for prisons, courts, poor houses and tramps, to say nothing of graft. It is reasonable that the more the people spend upon the proper education of the masses, the less will they need to spend upon the evils just named. The rank and file of tax payers, the day laborer, the mechanic, the farmer, the merchant, do not see that teaching requires either special aptitude or special preparation. They do not seem to see the need of much education, and often oppose strenuously the small tax imposed.

d. Men and Women as Teachers.

The fact that such large numbers of *men* are leaving the profession and that it is becoming a woman's calling has something to do with low salaries. It is not a question of whether the pay of women should equal that of men. In my judgment, for equal service it should. But public opinion, the law of supply and demand, and other economic problems have entered into this question of teachers' salaries and have made it necessary for women to teach and perform all their services for lower salaries than men receive for the same work. It is true that the more men there are retained and the higher the salaries paid to them, the better are the salaries of both men and women. It is also true that in systems where but a few men are employed, the salaries of women are perceptibly lower than the salaries of women where more men are employed.

e. Teaching Not Yet a Profession.

After all that has been said, however, one of the greatest causes of poor pay to teachers is the fact that the vast majority of teachers are not professional educators. The calling is still a stepping stone to other professions and will continue to be so long as present conditions exist. The prospective lawyer, doctor and minister are willing to take temporary employment as a teacher at a lower salary than a professional educator can afford to take it. There is a great deal in the attitude of mind with which one comes to a calling. Men enter law and medicine for life. The average life of the teacher is only three or four years. It is safe to say that a large percentage of those who teach on and on do so in yearly anticipation of some change for the better that may come to their relief. Again, many are teaching because they have not the courage to starve until a competence might come in the profession of their choice. Many others are teaching because they have not the means to go into business. Poverty makes teachers subservient to society. They get used to small means and small ways and for this reason are often incapacitated for the big things in life.

In conclusion, let me say that I have attempted to state the problem of the country school, and have suggested that its solution includes a study of (1) the material and commercial progress, (2) the social life in the community, and (3) the country school, and that a consideration of these phases made necessary the consideration of the (4) training and (5) salaries of teachers.

As the state university is an institution that really represents the state and helps in working out the problems of the state, so can the district school, with teachers thoroughly prepared—teachers who have

taken up the problem of the country school as their life work,—I repeat so can the district school become the little university of its community, working out the problems of the community and developing leadership. "So taught, the district school would soon aid the rural community in having better roads, better cattle, better butter, more eggs and more crops, better seed corn, better alfalfa," more trees and shrubs to beautify the yards and school grounds, better homes and better school buildings, with more tasteful interior decorations. "The school should be a local forum. It should co-operate with the church, the library, the farm, the farmers' organizations, with every farmer and every housewife, drawing the community together and making it a better place in which to live."

Two decades of this sort of work in the schools, touching the lives of all the boys and girls, would revolutionize agriculture in this country and would be the forerunner of the greatest industrial development this country has ever known. Men and women so trained would take up farming and farm home-making, and would work in agriculture and the other industries for the joy that comes from doing a worthy work well, for the satisfaction that comes from thorough preparation. Along with this satisfaction would come larger self-respect as well as larger returns in dollars and cents.

THE NEEDS OF THE COUNTRY SCHOOLS.

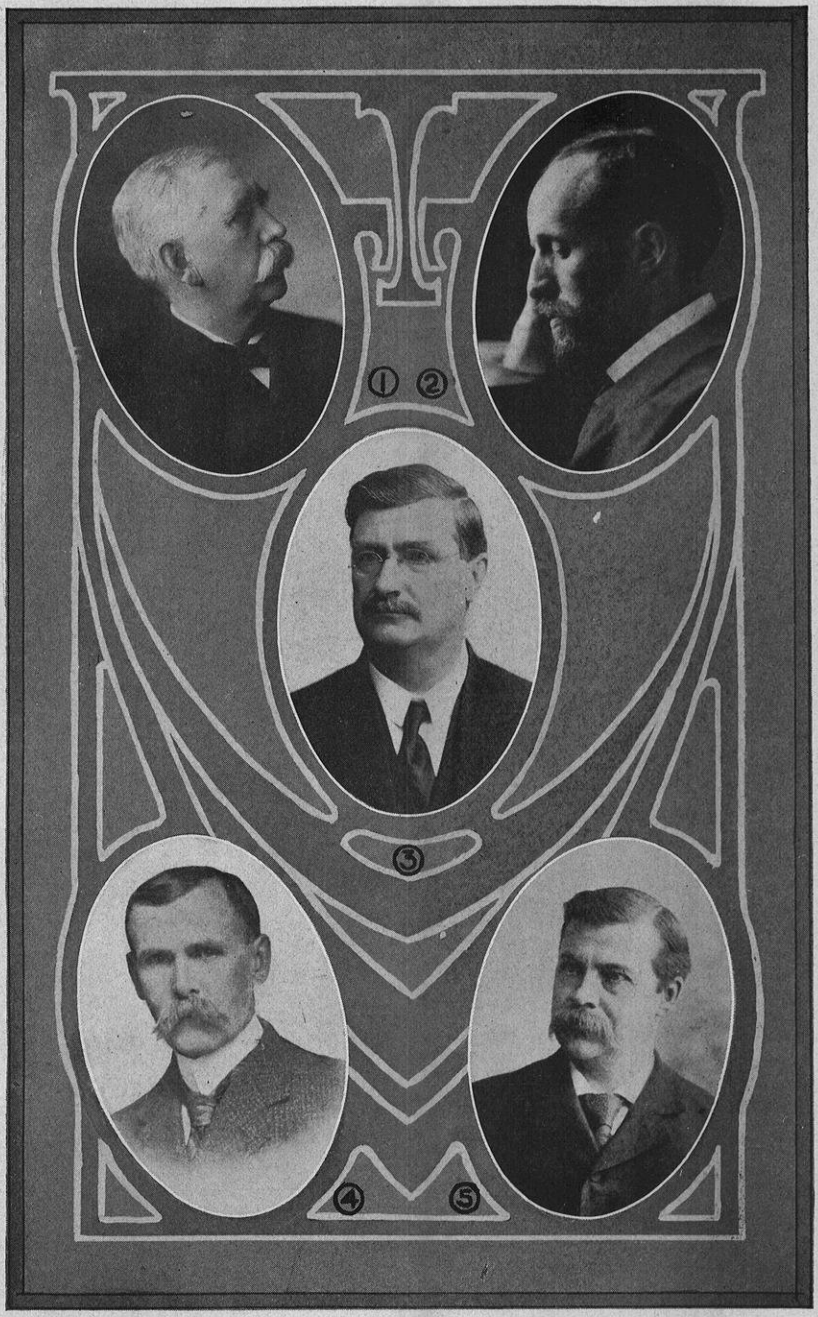
CHARLES P. CARY, State Superintendent of Public Instruction, Madison.

(Stenographer's report.)

If any idea in regard to country schools has escaped the report of the legislative committee, which I had the pleasure of signing, and which you heard yesterday, and the exhaustive and able address of President Cotton to which you have just listened, I do not know what it is. I had a little outline that I prepared this morning from which I thought I would talk to you, but as President Cotton went on with his address my pencil went through this and that and the other thing; in fact, I think he went through the whole subject with a fine toothed comb and if any wriggling idea got away, I am sure I cannot tell you what it is.

However, there is one aspect of the country school that after all has not had, it seems to me, quite adequate attention from the speakers, and I shall devote myself to that.

About two years ago the State Normal School at Superior sent out a pamphlet in which were summarized some things that were gleaned from examinations for entrance to the elementary course in the



1. Orville T. Bright, Chicago. 2 C. Riborgmann, Chicago.
3. C. E. Patzer, Milwaukee.
4. S. Y. Gillan, Milwaukee. 5. Chas. P. Cary, Madison.

Superior State Normal School. The people who took that examination were graduates of the country school largely and graduates of the eighth grade of the city schools. The surprising thing, and what may be a surprising thing to you, is the fact that those gentlemen who conducted those examinations found that making their examinations as simple as they thought they dared to make them, there was on the part of at least ninety per cent of those who took the examinations, a woeful lack of knowledge. This applied to both the country group and to the city group and what was perhaps more surprising was that it was found that those pupils who had gone to school in the country stood, so far as arithmetic, geography and spelling were concerned—for these were what they were examined in—27 per cent higher on the general average for five or six years, than the city group.

There is another fact in regard to this country school proposition, while I am speaking of it, and that is—let me put it in the words of another, I do not quite want to say it myself—"everybody who amounts to much in the world, got his start in the country schools." I do not want to say that myself, for I call on people now and then for their votes, and it might go quite hard with me to say that; furthermore, I do not altogether believe it. Nevertheless, if you take the run of judges of the supreme court, governors of states, congressmen and presidents of the United States, college professors and college presidents, or any other men that you would first think of as the leading men of the country, and those who are doing the most for good or for ill in the country, a large percentage are country school products. I think there is some reason for this perhaps aside from the mere question of teaching. The country boy, if he has any brains at all, is bound to make use of them. I must say right here that I was a country boy—it would not do to pass that by—but when I was a country boy and followed the plow, I was meditating, meditating, meditating; there was nothing to do but meditate—furrow after furrow, up and down the field—nobody there to talk with—scenery such as you had seen a thousand times before, and the result was that, with me at least, and I suppose that all country boys are the same, I was thrown upon myself. I remember as I followed the plow, and I was not over thirteen years old, the one thought of my life was on infinitesimal, which resulted by the time I was seventeen in my studying the calculus. I studied the calculus before I got out of the country school. But the study of infinitesimals came to me in this way. As I went along with the plow I just conceived of two lines starting from the handles of the plow and running to a distant star, and I thought how close together these lines must be after they got within a mile of that star. And when I

thought how close together they would be when they were within one-inch, one-quarter of an inch and an infinitesimal part of an inch; then, why stop with the most distant star, why not go on and on in space. That is where I got my first conception of the infinitely small and infinitely great. These are the things that go through the mind of every country boy as he plods along with only himself for company.

How is it with the city or town boy? He starts out on the street and before he has gone half a block he meets a companion and they begin to plot some sort of mischief to pass their time.

I think if you want to find self reliant men, you cannot go to any better place in the world than to the farm. The farmer boy is in a position hundreds of times a day almost, where he must think for himself; where he must act for himself. All of you who have lived on the farm know that the self reliance and the independence that grow up in one naturally are very hard to find in the city if one is simply dependent upon the natural forces that tend to carry him along.

Then so far as the country teacher is concerned. I think there are some of them that do not do things according to city methods, and I am really thankful that they do not.

I was in a country school recently and listened to a recitation in reading. The pupils did not read well. When the recitation was over—the teacher had not said one word about the reading except to call on the next one and so on—she said they did not read very well. I was disposed to think that this was a very miserable example of reading, but as I meditated over it, I said to myself that these children called the words with care, ease and rapidity. There was no expression worth mentioning in their reading, but I do believe that they were getting the substance of what they read, and that is the main thing after all. I believe they could have told afterward, if we had asked them, what they had read about and probably could have put it in very good form.

There are great possibilities in the country school, but I want to say to you here now, that while I believe in the consolidation, and especially do I believe that these little schools of very few pupils ought to be consolidated if there is any way possible, there are times and places where it cannot be done. Take for example the small schools up north where there are few families, it is impossible to bring these schools together by any process of consolidation. The roads are not fit, the distances are great, and conditions generally make it unfeasible to transport these children into the same school. Where the district will pay for the service of a teacher, it does not make much difference how small the school is. The trouble is, they

will not pay for the service ordinarily. After all, however, the way to learn is to have a teacher devote himself to you. That is the way the students in the various colleges, particularly those in the East, do. They fiddle away their time until just before examinations; then they get a tutor and concentrate their energies until they have mastered the material that they will have to know at the examination.

But, after all, while the fewer the pupils the better, so far as the actual instruction of the teacher is concerned, nevertheless, in the small school there is a lack of emulation. Since I am picking around and finding stray ideas as best I can, I want to say to you that it is my firm belief that we have weeded out of our schools an element of great possibility under the impression that it is a mistake and it is this thing of emulation. I noticed, and was pleased at it, that the new president of Harvard is building up that idea of emulation. We have it on our playgrounds; we have it in our games and I sincerely think it is the worse for our schools that we do not have it there also. Not the petty nagging kind, but generous rivalry.

There is one thing that is lacking in the country school and that is where I blame these people that want to keep their country school. They are unwilling to do for it what it so badly needs. They are unwilling to take an interest in it—a money interest—and that is where my quarrel with them begins. I have no quarrel with that community that wants to keep its small district school and will pay for it. The thing the school needs is enthusiasm, both moral, mental and spiritual on the part of the community. It needs adequate supervision.

I believe in consolidation, mark you, where that is the advisable thing for the community, but it is a problem to be worked out locally and not to be generalized upon. The great thing the country school needs is money.

THE SUPERVISION OF WISCONSIN'S RURAL SCHOOLS.

L. P. Fox, Chilton.

The supervision of the rural schools is entrusted to the county superintendents of our state. The office of county superintendent of schools was established by the legislature of Wisconsin in 1861, and the system of supervision by Town Superintendents then in vogue was thereby abolished. The town superintendent was an anomaly in our educational system, he has, however, long since passed out of

existence and memory; having left no history, our knowledge of him and the functions he performed in the educational field are traditional.

Among the duties which were imposed on the incumbent of the new office by the lawmakers of 1861, the following are to be found, "It shall be the duty of every county superintendent to visit and examine each district and all the schools in his district at least once in each year and as much oftener as may be necessary; to inquire into all matters relating to the management, course of studies, mode of instruction, text-books and discipline of such schools and the condition of the school-house, sites and outbuildings and appendages and of the district generally."

A discussion of how successfully the county superintendents have fulfilled this legislative mandate, and wherein they have failed to do so, and reasons therefor will be the object of this paper.

In 1862 when the first county superintendents were elected to office there were 59 counties in the state, with a population of about 775,000. Today we have 71 counties and a population of about 2,500,000 (Census of 1905, 2,228,919). In 1862 there were 59 county superintendents and now we have 72. The population has more than trebled since that time, while the number of additional superintendents provided for in 47 years has been thirteen. The duties of the office have been vastly multiplied since first established; but the means provided for enabling the county superintendent to fulfill his duties are the same as they always have been.

It is conceded by all that adequate and efficient supervision is necessary for the progress and development of our schools, and it is admitted by all who have studied our present system of supervising rural schools, that the system now in existence in the state is inadequate, unsatisfactory. If we are able to see clearly those defects, and fully realize that they are real and not imaginary, then we should be able to discover and administer the proper remedies. If a majority of the members of the Wisconsin legislature were made to fully understand what an enormous waste of money and educational opportunities are entailed by the lack of proper supervision of our country schools, they would immediately enact legislation that would remedy the evil. However, I am glad to say that there are a number of the members of the legislature who fully appreciate the importance of this problem, and who are doing their utmost to bring about a change. But you will ask are not the county superintendents themselves to blame for the inadequate and inefficient supervision of the country schools? No, they are not. They are surrounded by

conditions and burdened with duties which prevent them from rendering efficient service. What then are the defects of the county superintendency, which restrain it from efficiently supervising the rural schools of our state? They are:

1. Lack of help to enable him to properly perform the duties of his office.

2. Insufficient salaries.

3. Short term of office.

In 1908 there were enrolled in the 9,907 rural schools of Wisconsin, under the supervision of county superintendents, over 313,000 children; these schools being scattered over the entire area of the state. For the year ending June 30, 1908, the vast sum of $6,006,444.50 was expended for the maintenance of these schools. When you consider the vastness of the problem that confronts the county superintendency of the state, you will not be surprised to learn that the supervision of our rural schools is inefficient and inadequate. Seventy-two county superintendents, with little or no help, required by law to supervise nearly 10,000 teachers scattered over an area of about 50,000 square miles, making an average of about 138 teachers for each superintendent. The report of the committee of six on rural schools, says, "that not the least of the evils besetting our country schools is found in the sheer inadequacy of our county superintendency to meet the needs of the case." Again, the committee in discussing the impossibility of the county superintendent trying to supervise the schools under his jurisdiction, compares his attempt to a hen trying to cover one hundred eggs. The U. S. Commissioner of Education has this to say in his recent report, "I am convinced that improvement in the supervision of rural schools is one of the most urgent of our present educational needs."

The mode of procedure followed by the county superintendent in supervising the schools under his care is about as follows: he makes usually one short visit to each school during the year, looks things over hurriedly, has a talk with the teacher, and that ends the supervision of that school for the year. A few superintendents visit some of their schools oftener than once a year, and some cannot and do not visit all the schools in their charge even once a year. It is needless for me to say such supervision is well nigh valueless; but it is all that is provided for our rural schools in the great state of Wisconsin. It has been said that competent, skilled and close supervision will increase the teaching efficiency fifty per cent; if that be true, and I have no doubt but it is, consider what an enormous waste is going on annually in the rural schools of this state. If on an average we could increase the efficiency of the rural school teachers

50% by proper supervision, what an impetus it would give to education in the rural communities. We spent over six million dollars on the schools under the supervision of county superintendents, in 1908, and only about 1⅕ per cent of this amount for supervision. According to the report of the U. S. Com. of Education there is from 6 to 12 per cent of the total amount expended for schools in the cities of the United States, used for supervision. It has been demonstrated in cities that close and efficient supervision is necessary for the welfare of our school system. It is time that this fundamental truth should be recognized and applied to our rural schools. A business in which the vast sum of six million dollars is annually spent should be carefully and systematically managed; it should be conducted and organized similar to a well regulated business enterprise, so that every part of our country school system will be fully utilized for the advantage and welfare of more than ⅔ of the children of the state who are enrolled in it.

These schools are the most important class of schools in the state. The most important because they serve the greatest number of people, therefore, very closely allied, with the industrial, political and social welfare of our state. That the country schools are not doing the work they should or could do is admitted by all. That we are not getting the returns we ought to get for the capital invested and the amount of money annually expended is unquestioned. The finished product, that is the number of pupils who finish the course of study annually, is too few compared with the number who enter school. As an illustration, I will give you the figures for Calumet county for the year ending June 30, 1909. There were enrolled in the schools of the county outside of graded schools of all classes, 1,972 children. If we allow eight years for the completion of the course of study for country schools, we find that about 246 children should have been graduated from the country schools at the end of the 1909 school year. But what are the facts, the actual number of graduates for these schools was 44. Less than 18% of the total number of children who attend our rural schools ever go long enough to complete the course of study. In other words it means that only 18 children out of every one hundred children who are enrolled in the country schools, go long enough to complete the work outlined for these schools. That 82 per cent drop out all along the line before completing the work of the upper form. I believe that Calumet county is fairly representative of the rural school conditions of the whole state, and these figures can be taken as being approximately correct. It has been said that not more than 50% of the number of children who enroll in the rural schools of the state, ever get beyond the fourth grade or its equivalent.

We have provided school accommodations, equipment, and teachers for the purpose of giving every boy and girl in the state a common school education, yet less than 18% of those who enroll in the public schools ever complete the course of study. We have provided a great State University, of which we are all proud; the state has an excellent system of Normal schools, we have numerous county training schools, schools of agriculture, high schools, and state graded schools, all of which are maintained at a very great expense, yet notwithstanding all that, a very large proportion of our people are not obtaining a common school education. We have attacked the country school problem in various ways and from different standpoints, while we have made some progress, still the great problem remains unsolved.

To make a state or nation great, we must have intelligent, educated, moral, and industrious common people. People who will utilize the natural resources of the state to the best possible advantage. People who have received sufficient education to enable them to enjoy life, be capable of taking part in public affairs, men and women who will get the best results from the labor expended in whatever occupation they may be engaged, and if our country schools are failing to do these things, or are doing them poorly, then they are not fulfilling the purpose for which they were established. We cannot accomplish very much of real value by talking about these things here or to people who understand the conditions and realize the necessity of improvement. We must educate the country people themselves to higher educational standards. The district school will be no better than the community demands. If the educational ideals of the district are high, the people will demand and insist upon having a good school, good buildings, and equipment, and most important of all, a competent teacher. Such people are willing to make a present sacrifice for the future good of their children. In order to get at the bottom of the matter we must educate the people of the rural districts so that they will fully appreciate the value and importance of the school, then we will have solved the country school problem. Hence we must be able to convince them it is to their advantage and the advantage of their children, both socially and financially, to provide and maintain good schools. But how may this work be accomplished and by whom? It is certain that very little progress can be made by publishing and distributing bulletins or reports of committees or by other "long-distance" means. Those conditions will be improved very little, by the Country Life Commission which after having made extensive investigations, published its findings in pamphlet form, to be stored away in some musty vault or basement at Washington, D. C., inevitably to become of interest only to the antiquarian or curio collector of a future generation. If this result is ever to be accomplished, it will be brought about by and

through the agency of the county superintendency and the teachers in the rural districts.

I am convinced, that if the active and energetic county superintendents of the state had the necessary assistance, to carry on the work of the office successfully, they could in ten years revolutionize the educational sentiment of their respective counties, and place the rural school on a plane with the city and village schools in efficiency and usefulness. The influence of the county superintendent reaches out directly or indirectly to every home under his jurisdiction, and if the incumbent of the office is a man or woman of strong character, common sense and activity, backed up by reasonable and effective laws, his power for good will be very great and far-reaching.

But what are the conditions with which the county superintendent is confronted, in the discharge of his duties? He is required by law to conduct at least five examinations, every year, prepare questions for these examinations and correct all the papers submitted, which in the smallest counties number from 1500 to 2000 separate papers, and in the larger counties from 3000 to 4000. Select Library books for the county, annually, make out and compile his annual report, pass upon applications for special state aid, make out a lengthly report to the State Superintendent, on each school applying for the special aid; look after the enforcement of the compulsory attendance law, make his annual report to the county board, call and hold School Board Conventions, Teachers' Meetings and Institutes, keep up the correspondence of the office with from 150 to 600 school officers and from 65 to 350 teachers besides many other things not specifically enumerated by law. The result is that the county superintendents of Wisconsin have become clerks. They are gatherers of statistics and makers of reports, and these reports and statistics with few exceptions are of little value or interest to anyone. Nearly all of the clerical work connected with the office could be done by a clerk at a far smaller expense to the county than the present cost. Then it would relieve the county superintendent of the office work and enable him to devote all his time to the *All Important Work*, the Supervision of schools.

The report of the committee of 12 on rural schools says that every rural school should be visited and supervised at least once in two months, spending one-half day at each school. It further says that in order to properly supervise the schools each one should be visited once a month. Let us see what would be necessary in some of the counties of Wisconsin to permit the county superintendent, or his assistants to visit each school every two months, and spend one-half a day at each school. Grant county has 340 schools under the supervision of the county superintendent. In order that the schools of Grant should

receive the minimum amount of efficient supervision, the superintendent should have at least three assistant supervisory officers, besides a competent clerk in the office to do the clerical work. If Grant county would pay its Superintendent $2,000 per year, one assistant $1,400, two other assistants $1,200 each and a clerk $600; this would make a total of $6,400 to be spent for supervision annually, in a county that spends about $151,000 on the schools under the supervision of the county superintendent, in which 9,394 children are enrolled. This would be an expenditure of about 4¼ per cent of the total amount spent for schools, in the county, for supervisory purposes. This is not too much. Nor does it amount to the minimum outlay for supervision in cities, which ranges all the way from 6 to 12 per cent of the total amount spent annually for school purposes. The city of Ashland with an enrollment of about 2,285 pupils, and employing 75 teachers, spent $6,500 for supervision in 1907. Therefore, it becomes very evident that we must spend more money for the supervision of our rural schools if we desire to obtain satisfactory results.

The counties of Wisconsin in regard to the number of teachers employed in them under the supervision of county superintendents, may be roughly classified as follows:

First, those which have not more than 100 schools; second, these which have from one hundred to two hundred inclusive; third, all which have over 200 schools. Under this classification we will have 24 counties with not more than 100 schools; 41 counties containing from 100 to 200 schools inclusive; 7 counties with over 200 schools. Each superintendent in counties designated as class one should have one assistant or deputy, and a clerk; in counties under class two he should have two assistants, and a clerk, and those in class three, three assistants and a clerk. I am fully convinced that nothing can be done toward improving the county superintendency and making it more efficient as long as it is under the control of county boards. Forty-seven years of experience with county-boards ought to prove to the most skeptical that this is true. The legislature of Wisconsin must take this matter in hand, and enact some legislation which will greatly enhance the efficiency of the county superintendency, thereby vastly improving our country schools. But you will ask hasn't the legislature of Wisconsin done anything toward improving the county superintendency since 1861? Yes, it has passed numerous laws affecting that office, and it has imposed a large number of additional duties upon the county superintendency; but in all these years it has done nothing to increase its usefulness and efficiency. It is something like the story of the old negro down in Tennessee, who had been sick a bed for six months having suffered severely from rheumatism, heart trouble, liver complaint and many other ailments, after having been

on the point of death several times, he recovered sufficiently to go to church, after the prayer the parson called upon the old darky to tell what the Lord did for him. The old negro arose and said. "I declare brodder parson, the Lawd almost killed me."

When we consider what efficient and close supervision will do to increase the efficiency of the rural schools, and study our system of supervision of these schools, and what the few superintendents charged with this duty are expected to do, and the means provided to enable them to do the work, it is very plain that the supervision of rural schools in the state of Wisconsin is a farce.

What is it possible for the superintendent of Marathon county to do toward the efficient supervision of the schools of that county in view of the conditions that confront him? He is expected to properly fulfill the duties of his office which includes the supervision of 235 schools, in a county having an area of 1532 square miles, an area nearly seven times greater than that of Milwaukee County. This county has within its borders 184 school districts, managed by 552 school officers with whom he has to deal. All that it is possible for the superintendent to do under such conditions is to take a peep into each school once a year, and perhaps not that often, then trust to chance and the teacher for the success of the school. How is it possible for one man to perform the duties of the office properly in Clark county with its 140 school districts; 200 teachers, scattered over an area of 1200 hundred square miles; Dodge county with its 189 school districts, and 235 schools; Fond du Lac county with 163 school districts, and 192 teachers; Manitowoc county having 111 school districts and 206 teachers. One trouble with the superintendency is that the people of rural communities do not fully appreciate the importance of the office, as an educational factor in the county. Some of them regard the superintendent as a necessary evil inflicted upon the community by authority of law, and the less he does toward improving school conditions the better he will be liked by this class of people. You can be elected county superintendent in most any county of the state, hold the regular examinations required by law, drive around through the county, occasionally, give out the news that "all is well", educationally; be re-elected, and be regarded as a most successful officer, without doing anything of real value for the betterment of the schools. On the other hand the superintendent may be a good school-man, devote his entire time to the work of his office, attend faithfully to his duties in season and out of season, and for his trouble he is likely to be turned out of office at the end of the term. It is no proof that a man or a woman is a good superintendent because he or she can be re-elected repeatedly. Neither is the defeat of a superintendent evidence of his incapacity.

It is an office in which you may do very little and get along well, and do very much and get along no better. Therefore, it follows that if some of us travel the road of least resistance we are but obeying the instincts of human nature.

The office in many counties is not on the same plane with other county offices in the payment of salaries or in the offices furnished and equipped by the county board. You will often find the county superintendent's office in some corner of the basement of the Court House or in the back room in the third story where nobody can find it, while some have their offices wherever they happen to board or room. The system of records provided is not at all equal to that provided for other county officers. In fact there is no uniform or permanent system provided for properly keeping and preserving the records of the office. When I assumed the duties of the office of county superintendent nine years ago, my predecessor turned over to me a certificate blank book, a bundle of unmarked examination papers, and a quantity of old reports, and records thrown in a pile in one corner of the office. This constituted the office equipment and records of an office that had been in existence over 38 years; an office under whose jurisdiction was placed the public schools in the county. The little room that had been provided for the county superintendent's office in the county building had never been occupied by any of my predecessors. It served the purpose of a store room for the building, where broken chairs, tables and other rubbish were deposited. Of course, the former superintendents had no use for an office. They had their farms to work and manage; their newspapers to publish, hence had but little time to devote their "side line", the county superintendency. But conditions are much the came to day as formerly, there are superintendents in Wisconsin at the present time who are practicing law, running farms, publishing newspapers, and engaged in other occupations while holding the office of county superintendent. We have been criticised by members of the legislature and others because of these things, and some of the lawmakers have said you cannot expect any remedial legislation until the county superintendents themselves cease engaging in other occupations and professions, and devote all their time to the work of the office. But my answer to such statements is this, that just as long as you pay the county superintendent a niggardly salary, the average being $969 for the whole state, and leave the office under the control of the county boards; just that long will the county superintendency remain inadequate and its work be unsatisfactory. Many of the superintendents are compelled by force of circumstances, to take up some other work in order to earn a living for themselves and their families. They are obliged to do this not

because they want to; but because they must. Under present conditions you cannot hope for a better superintendency than we now have. It is time for the legislature to act, and place upon the statute books of Wisconsin, laws that will provide sufficient salaries, sufficient help, and a longer term of office. Put the salaries on a basis with that paid city superintendents in the state, then the lawyer, the farmer and the newspaper superintendents will disappear, and the efficency of the county superintendent, and the schools under his supervision will increase a hundred per cent. I think you will agree with me that the salary paid individuals in any particular profession or occupation has much to do with the skill and proficiency of those engaged in them. Hence the reason for the existence of a strong city superintendency in Wisconsin, at the present time. The average salary paid to the city superintendents in 21 cities outside of the city of Milwaukee was $2,243 per year, in 1907. Contrast this with the average salary of $969 paid the county superintendents of the state. In 1907 the total amount paid in salaries to the superintendents of the counties of Ashland, Douglas, Florence, Forest, Iron, Oneida, Pepin, Price, Sawyer, Vilas and Washburn,—eleven counties in all—was $6,990 making an average salary for each superintendent of $635.00. The superintendents of the eleven counties named are required by law to supervise about 700 teachers scattered over an area of over 10,000 square miles. The city of Superior pays $2,000 more for the supervision of its 188 schools than do the eleven counties named.

The cities of Beloit and Janesville,—two cities in Rock county spent the sum of $7,602 for the supervision of their 155 schools in 1907, while the counties of Dodge, Grant, Marathon, Monroe, and Vernon spent the sum of $6,100 for the supervision of their 1,200 country schools in which 40,150 children were enrolled, for the same year. I could give you a number of additional illustrations which would show you the vast disproportion in salaries paid to county and city superintendents; but the above will suffice for my present purpose.

There is no profession of county superintendents in Wisconsin. There is no future that a man or woman can look forward to in this office. There is no incentive for any man or woman to make a life work of the superintendency, he may hold the office for a few terms, then he will be defeated or resign. This will end his career as a supervisor of rural schools. It is not probable that he can get back into the superintendency in the county in which he lives and he is not eligible to office in any other county in the state. How different it is with the city superintendency.

The school board of any city has the legal right to go anywhere in the state or out of the state to procure the man or woman it wants for

superintendent. The same is true with reference to hiring teachers for our schools. Another important thing to consider with reference to this office is the short term. A two-year term is not long enough. There is no reason why it should not be as long as the term of the county judges, better still, to have it as long as the term of the circuit judge.

It is folly to require the county superintendents to be compelled to make a campaign every two years. He is put to the xpense of making a canvass for the office, and then he must be a good fellow and "stand in" with the "powers that be" to secure the office. The fear of defeat, or of making enemies often deters him from administering the duties of his office as strictly as he should. He may have plans that he desires to carry out with reference to school betterment that meet some opposition from the people, and in the stress of circumstances sacrifice his plans in order to avert defeat. Therefore, I believe that the term of office should be made longer and the county superintendents relieved of the necessity of making an expensive campaign every two years.

We have passed laws which have greatly improved the heating, ventilation, and equipment of our country schools, also providing for the condemnation of buildings unfit for school purpose; laws establishing county training schools, and additional Normal schools; a more stringent compulsory attendance law; a law providing for professional training before certificates may be legally granted; a law making large appropriations for University extension work, and for the establishment and special aid of state-graded schools. All this accomplished within the past ten years; but we have not made any substantial improvement along the lines of providing adequate and efficient supervision for our rural schools. In view of the fact that the question of better supervision of the country schools has been discussed and agitated for nearly twenty years, and that several unsuccessful attempts have been made to enact legislation that would remedy the evil, it is, to say the least, quite discouraging. In 1890 the Wisconsin Teachers' Asscciation outlined a plan which had for its object the improvement of the county superintendency. This plan was later embodied in a bill and presented to the legislature, but met defeat.

I wish to discuss briefly, the latest attempt made in the effort to improve the superintendency. The committee appointed by the Wisconsin Teachers' Association two years ago, met and prepared a bill, which was later presented the legislature. In substance, the bill made provisions for a County Board of Education, for each county consisting of five members,—four to be elected at-large from the county, and the fifth member to be the chairman of the county board. The pur-

pose was to vest this board with power to elect the county superintendent, and provide for the necessary help needed to carry on the work of supervision successfully. In short, it was intended that this board should be vested with powers, similar to boards of education in cities, with the exception that it would in no way infringe upon the powers and duties vested in school boards. This was in charge of the members of the committee who prepared it, and when it came up for hearing before the Assembly committee on Education, a number of persons representing the different educational interests of the state appeared before the committee and made arguments in its favor. No one appeared against the bill. The Assembly committee on Education was in favor of the bill, and recommended it for passage. But when it came to a vote in the Assembly it met the fate of all previous bills on this matter,—defeat. It was defeated by a large majority in the Assembly. One of the reasons for the defeat of the bill was the opposition of many of the county superintendents themselves. There are two possible explanations for this, either the bill was not satisfactory to those superintendents who used their influence against it or they are entirely satisfied with present conditions. Let us hope that the latter is not true. However, I am convinced that the matter of providing efficient supervision for the rural schools, will be brought to the attention of the legislature again and again, until it is settled and settled right.

Many of the states are far ahead of us in the provisions made for efficient supervision of rural schools. Illinois has a law which compels the county board to furnish all the assistance needed by the county superintendent to carry on his work successfully. In that state the term of office is four years, and the minimum salaries fixed by the legislature range all the way from $1,250 to $7,500 per annum. It further provides that this minimum salary shall be paid out of the state treasury, and whatever additional salary the county board wishes to pay must be paid by the county. In North Dakota the law requires the county board to furnish and pay a deputy when there are 50 schools under the supervision of the county superintendent. It also provides for an additional deputy when the number of schools reach 150, and after that, one deputy for every one-hundred schools or major fraction thereof.

The Vermont law of 1906 provides one supervisor for each district having not more than 70 schools nor less than 30, and under this law the supervisor is required to devote all his time to supervision, and the Maine law of 1905 limits the number of schools for each superintendent to 50. Even the states of Louisiana and Mississippi have recently passed radical laws for the betterment of the supervision of the rural schools. Louisiana has established an educational qualification for those who may be elected to the office.

We recognize the fact that Wisconsin has made much progress along educational lines. But as far as the county superintendency is concerned, it is about in the condition in which it was in twenty-five years ago. The cry often goes up, why does not the legislature do something for the country schools? The legislature will do something for the country schools in the way of better and more efficient supervision, when it awakes to the importance of this great school problem, and when the people of the state demand it.

If we only talk about this matter at teachers' meetings, and neglect to present our arguments to those who are opposed or indifferent to any plan which has for its purpose more efficient supervision for our country schools, we will fail in our attempt to secure better conditions. We must carry on a campaign for this much needed educational reform, and not to do as the biblical man, who "beheld his countenance in a mirror, and went away and presently forgot what manner of man he was."

I have faith in the ultimate success of some plan for improving the supervision of our country schools, altho it may be deferred for a few years, we are certain to succeed in the end. Then the county superintendency will be released from its restrictions,—it will then occupy the position it ought to occupy, and do the work it should do for our country schools. Let our watchword be better country schools and better supervision.

A SQUARE DEAL FOR THE PUBLISHERS.

S. Y. Gillan, Milwaukee.

Ole Bull, the great violinist, achieved no greater fame than did Stradivarius, the maker of violins. The man who can run a locomotive and the woman who can manipulate the keys of a typewriter or run a sewing machine command a certain respect, but surely no greater than that which is accorded to the builder of locomotives, or typewriters, or to the inventor of the sewing machine. The maker of a good school book is a factor in the scheme of education no less important than the user of a good book.

No field of human achievement, not even the application of science and invention to modern industry shows greater improvement than is seen in the school-books of to-day as compared with those that were in use a hundred years ago or even fifty years ago. This is a bald statement of fact which would be easy to support with conclusive evidence and specific illustration if that were necessary and time permitted. For an extended and highly interesting discussion of the

crudities of the old text-books, allow me to refer to an illustrated article by Mr. A. E. Winship in the Journal of Education on June 24, 1909. A few suggestive quotations from the article may suffice for illustration:

HORRORS OF THE OLD ARITHMETIC AND GEOGRAPHY.

In arithmetics, up to within seventy years, the problems were such as would not be tolerated to-day. Here are some taken at random from some old arithmetics, mostly in my own library, many of them in general use as late as the forties:—

Examples on lotteries are common.

If nine cats have killed 18 birds, how many has each killed?

If a cat divides 4 birds between 2 kittens, how many will each kitten have?

There are very many problems of cats killing birds.

It is an exceptional page that does not have problems on beer, ale, wine, rum, gin, or brandy. Every child had to learn the table of "wine measure," also of "ale and beer measure." No other commodity was in such universal use in arithmetics as intoxicating liquors.

But the worst feature of the arithmetics was the love of bloody incidents. There was a gruesome fondness for ghastliness with the schoolbook makers. An arithmetic first issued in 1831 and in use long after has most of these problems:—

A man had seven children; 2 of them were killed by the fall of a tree. How many had he left?

Threescore and ten kings had their thumbs and their great toes cut off and gathered under the table of Adonibezek. How many thumbs and toes were under Adonibezek's table?

A person was 17 years of age 29 years since, and suppose he will be drowned 23 years hence; pray, in what year of his age will this happen?

A human body, if baked until all the moisture is evaporated, is reduced in weight as 1 to 10. A body that weighs 100 pounds when living weighs how much when baked?

The geographies vied with the arithmetics in repulsiveness. Indian massacres are common. Selling female slaves was an attractive picture to authors. Slave catching in Africa is another delectable experience. Of course bull fights are a necessity. Persecutions of early Christians with burnings at the stake are in order.

Not only were the geographies until within sixty years filled with silly things to learn and horrible pictures to see, but the language was ridiculously grandiloquent, as, for example: "Everything in the universe is systematical, all is combination, affinity, and connection. The beauty of the world is founded in the harmonious diversity of the beings that compose it; in the number, the extent, and the quality of their effects, and in the sum of happines which it is capable of affording."

Among the gruesome pictures found in the old geographies were a wolf killing an antelope, a big snake killing a horse and a man, a widow about to be burned on the funeral pyre of her late husband, a man being prepared for sacrifice in a heathen country and, near by, a pile of human skulls of former victims.

A glance at any old text-book of a former generation will convince

any one that wonderful improvements have been brought about in this field of educational service.

The general quality of the teaching in our schools has also improved in two generations, and the price paid for it has greatly increased; but the price of text-books has decreased. They are cheaper to-day than they ever were before.

The total cost of schoolbooks for the whole United States is not quite $12,000,000, or about 15 cents a year for each inhabitant. Seventy-five cents per year per pupil enrolled in the public and private elementary and high schools will more than cover on the average the cost of text-books; the cost nowhere exceeds two dollars per pupil per year; in the grades below the high school in Milwaukee it is a little less than $1.50. To be exact, it is $11.54 per pupil for the eight years below the high school. The cost of the books used is less than three percent of the total cost of the schools.

Notwithstanding all this, a large part of the public have been deceived into the belief that schoolbook publishers are extortioners if not robbers. Rash and untruthful statements in sensational newspapers and by demagogic politicians have created a wrong impression in the minds of many people. Professional grafters have come to look upon schoolbook publishers as legitimate prey. An eruption may usually be expected in the yellow journals when legislatures are in session. Last winter the Chicago Journal printed day after day the most absurd falsehoods in regard to schoolbooks and the different prices charged in different parts of the country—a variation which the investigation conducted by the Chicago school-board showed to be due simply to varying systems and conditions of distribution. But the agitation caused by the Journal's cry of "Stop thief" resulted in legislation of the most grotesque sort ever enacted in any state. The Illinois text-book law enacted last winter and known as the Ettleton law is so inexpressibly bad that thus far no effort has been made to enforce it. Under this law, if enforced, one publishing house would be obliged to pay cash fees of $15,000 and put up bonds in the amount of $8,600,000 for the mere right to offer their books for sale, whereas the total annual sales of text-books in that state amount to only about 7 percent of that sum.

Freak legislation like that recently enacted in Illinois is liable to be introduced in the legislature of any state, and under the excitement engendered by the demagogic utterances of small politicians and a sensational press any legislature may be stampeded. Teachers should be informed as to the facts pertaining to the cost of text-books as an item of expense in public education.

The popular belief that the cost of schoolbooks is excessive and enormous has no facts upon which to rest. The figures which bear upon the subject point directly to the fact that the necessary school-

books are low in price; that the amount expended for books in the United States is small when compared with the number of pupils supplied; and that the per capita expense is a very small figure.

The following exhibits are taken from official records and show that the cost per pupil is about 50 cents per year.

State of Maryland.

This state yearly appropriates money to be expended for the necessary text-books for all the public schools of the state. The amount appropriated is apportioned according to the total number of pupils enrolled in each county and both common school and high school books are purchased. For the year 1908–09, $150,000 was appropriated and this supplied the books for 238,656 pupils—an average cost of 63 cents per pupil.

City of Cincinnati.

In this city the Board of Education purchased books direct from the publishers and loaned them to the pupils free of cost. Up to and including the year 1908 the text-books purchased included those necessary for pupils in the grades; however, in the year 1909 the text-books for high schools were included. In the year 1905, 44,227 pupils were supplied at a cost of $25,707.23 or a cost per pupil of 58½ cents. In 1906 there was expended $13,109.08 and this supplied 42,812 at an average cost of 30½ cents. In the year 1907 there was expended $21,522.28 for 44,018 pupils, or an average cost of 41 cents. For the year 1908 (which included high school pupils) there was expended $27,677.62 for 43,927 pupils or an average cost of 63 cents. During the four years the average amount expended per pupil was 50½ cents.

City of St. Louis.

For the six years, 1903–09 inclusive, there was expended by the Board of Education $227,821.81 and this supplied all necessary books for the 516,259 pupils. This is an average cost per pupil of 45 cents. In passing it might be well to note here that the city of St. Louis purchased and supplied free to the pupils stationery during the six years above named. The amount expended for stationery was $237,704.09, or an average cost of 46 cents per pupil.

City of Detroit.

The Board of Education has been purchasing books since the year 1902 and during the 17 years has expended $314,681.58 and the books purchased supplied pupils to the number of 638,266—not quite 50 cents per pupil.

State of South Dakota.

In this state the law governing the adoption of books empowers the Board of Commissioners of each county to purchase books direct from the publishers and supply them to the pupils through appointed depositories at cost plus a 10% advance which is a commission to the depositories or agent. The following amounts expended in twelve of the counties of South Dakota in the year 1907–08 indicate what the text-book bill of that state is yearly.

County.	Amount expended.	Enrollment.
Marshall	$523.88	20,014
Hanson	583.36	1,684
Kingsbury	188.31	3,334
Stanley	1,256.20	2,628
Potter	740.71	998
Sanborn	602.03	1,530
Union	834.97	2,365
Turner	1,203.39	3,856
Douglas	942.05	1,268
Beadle	1,126.48	3,194
Hamlin	950.47	1,617
Walworth	609.03	1,820

Stafford County, New Hampshire.

The total amount expended by the twelve counties for books was $11,255.38 and the total number of pupils supplied was 26,308—an average cost per pupil of 43 cents. 10% profit over cost of books was given to the dealer or county agent, and consequently the amount paid by the pupil for his books was but 47 cents. As there were in attendance in the public schools of South Dakota 72,363 pupils the total book bill of that state was not quite $36,000 for the school year 1907–08.

In the report of the State Superintendent are given statistics relating to the cost of education by counties and this county is typical of all others in the state. In the year 1908 the total amount expended for Education in Stafford County amounted to $132,401.15. The amount expended for text-books was $3,499.40. Of each dollar expended for educational purposes in Stafford County but 2.63 cents was expended for school books.

Minnesota.

For the year 1908 the total disbursements for educational purposes was $11,495,615.80 and the amount expended for text-books was $208,118.22 or 1.8% of the total disbursements.

For 15 years, 1890–04 inclusive, the schoolbook bill of the city of Omaha, Nebr., was $119,482.96 and the number of pupils supplied during the 15 years was 241,510. Cost per pupil less than 50 cents.

It is not a square deal to assume that publishers are pirates or to ignore the profoundly important service which they render to our schools through the sharp competition which keeps them always alert to produce books that reflect the best in modern authorship and mechanical make-up.

We hear sometimes about a "schoolbook trust." Sometimes a young lawyer in the pinfeather stage of his evolution, or a politician who wants to get his name in the paper, or it may be a doctor who is chafing under the restraints of the ethical code of his profession which forbids him to advertise, gets himself elected on a school-board and becomes very active in the effort to save us from the grinding, heartless, monopolistic, machinations of "the book trust."

The Publishers' Weekly, the American book trade journal, in the July 24th number, gives the names and addresses of 179 separate and independent schoolbook publishers located in 44 different cities of

the United States. How does this tally with the notion of a "book trust?" If prices are too high, the field is wide open for more competition; there is nothing monopolistic about the business.

Some Int resting Facts.

The report of the U. S. Commissioner of Education for 1908 gives the number of pupils enrolled in the public schools as 16,890,818. The same report gives the amount expended for all public school purposes as $336,898,333, or a cost per pupil based on average attendance of $28.25.

In the state of Wisconsin, for the year 1907–08 there were in attendance of the public schools 309,415 pupils; the book bill was about $155,000. Not a large sum when compared with the $9,377,620 which was the total cost of the schools for the year 1907–08.

In the year 1907 there were in the United States 24,262,936 children from 5 to 18 years of age and of this number there were enrolled in the public schools 16,890,818, in the parochial schools 1,356,213 and in the private schools of all kinds about 450,000. The school book bill of the United States is about $12,000,000 per year, and this amount supplies books not only to the pupils in the public schools but to the pupils in business colleges, parochial schools, academies, colleges, and private institutions of every kind.

The conditions which affect the cost of books are:

1. The number of books the pupil is required to buy in any given year.
2. The number of years the pupil attends school.
3. The length of the school year, and the usage the book receives.
4. The law or rule governing the distribution of books.
5. The standard of authorship and the mechanical construction of the book.
6. The permanency of market given the publisher. We are an extravagant people, but not in the matter of schoolbooks. In the year 1900 the people of this country spent for

Cigar Boxes	5,856,915
Perfumery and Cosmetics	7,095,713
Mineral and Soda Water	23,874,429
Bicycles and Tricycles	31,915,908
Patent Medicines	59,611,335
Confectionery	81,290,543
Liquors	240,615,466
Tobacco	283,076,546
Schoolbooks	12,000,000

What shall we say of the teacher who acquires the free-sample-copy habit? He certainly does not give the publisher a square deal, and he is still more unkind to himself, for he cultivates a spirit that pauperizes and debilitates his own soul. Not long ago a principal in this state wrote to a publisher that he might change a certain high school text, and that it would be necessary to send a copy to him, one to the teacher of the branch and two to the committee on text-books. This was done, and the book was adopted. When the agent called just before the opening of school, the dealer had three copies of the book

on hand and he explained that he had "picked them up locally." The class to use the book numbered only four.

At teachers' meetings publishers give away many hundreds of dollars' worth of books that are never used for the ostensible purpose for which they are taken. The publishers know this, but how can they discriminate? They must assume, at least they do assume, that the recipients of these gifts are honest and are not merely sponging. A finer ethical sense should be cultivated, and a stronger spirit of square dealing engendered than is now commonly prevalent among teachers who receive free sample copies.

Do those who manage our teachers' associations realize the importance of the publishers as a factor in the educational problem? If so, they have a rather platonic, not to say apathetic way, of showing their appreciation. It would seem that on the program of any great association of teachers with all the manifold sections and departments for promoting the various specialties and activities of school work, it would be reasonable to assign at least one topic at each meeting to the men who furnish the teachers' tools. Instead of this, the publishers and their representatives are never considered in the making of programs.

In a certain office building in this city is a placard which reads: "Peddlers, dogs and book agents not allowed in this building." The committee in charge of this meeting did not enforce absolute exclusion of book agents from the hall; they were willing to admit them and graciously allow them to exhibit their books—for a consideration —20 cents a square foot for the space occupied. This is as far from a square deal as it would be to charge the speakers twenty cents a square foot for the space they occupy on the platform; for no speech or paper delivered during the whole three days' session will have as far-reaching and lasting an influence as a good exhibit of schoolbooks would have had. But it is said that a charge was necessary to help defray the expense for the hall; that it cost the committee $600 for rent of the auditorium. There is in Milwaukee an association with a paid secretary whose time is given to soliciting and securing conventions for this city, and it spends many thousands of dollars every year to induce conventions to come here, some of them not one-fifth as large as this one. Our association comes without solicitation and without any traveling expense of a salaried secretary to go and persuade it to come. The members of this association spend about $40,000 in Milwaukee at each annual meeting. A square deal would place the hall expense upon those who profit by the meeting rather than upon the publishers. But it may be said that publishers should pay for exhibit space because the advertisement thus obtained is a commercial asset. And how is it with those who appear on the program?

Do they not also get advertisement that has a money value? A successful platform effort before a teachers' association makes for promotion. If a member is appointed seventeenth vice-president the fact is duly heralded in the home paper; if he attains to high position in the association and ever runs for office or applies for a bigger job, his standing in the association is credited to him as a part of his record, and properly so. No, the publisher who makes an exhibit is not the only participant in these meetings who gets valuable advertisement incidental to what he contributes to the meeting. Be fair to the publishers and their agents.

The publishers are entitled to a square deal from the law maker, from the school board, from the individual teachers and from organized associations of teachers. No branch of educational service is more important, and none engages the effort of abler or more worthy men and women.

THE TEACHERS' PENSION FUND MOVEMENT.

ELIZABETH MARIE HERFURTH, Madison.

After the victory of our teachers' insurance and retirement fund bill in the legislature, we had hoped that this November meeting of the Wisconsin Teachers' Association might be turned into a jubilee such as the state had never seen before—a jubilee commemorating the long step towards the emancipation of the public school from a necessitous teaching force. Shackled by cheap, underpaid teachers, the school must ever be the slave of circumstance. Not until teachers are freed from the iron chains of care and worry—worry in fruitless efforts to make the ends of low-wage and future existence meet—will the public school tend to develop into an institution worthy of the purpose for which it was created,—an institution for the people, for the masses It should be placed on a high plane, above the storm and stress of a struggling existence, making it the backbone and strength of the commonwealth.

Of the children who enter the public schools of this state, fifty per cent. never get beyond the fourth grade and about ninety per cent. never get beyond the eighth grade. They leave the school to become a part of the active community—the wage-earners, the bread winners—and represent the future standard of the state. Here, therefore, in this "factory of American citizenship," as Colonel Roosevelt calls the elementary school, should be the strength and fiber of the teaching force,—the best the land can afford. Yet here, where the child spends the most critical and impressionable period of his life—here, in this

workshop of soul-moulding, is found the fluctuating mass of cheap, under-paid teachers. Thus the child, for whom the school exists—the child, the joy and center of the home, is sacrificed to penurious school conditions.

High-class schools and care-burdened teachers do not go hand in hand. A pinched daily existence with a gaunt, barren future staring the teachers in the face, year in and year out, does not and cannot promote the best interest of the school. Such conditions leave their impression upon even the strongest teacher, just as surely as the constant drip, drip of the water leaves its eternal mark upon the solid rock. The influence of the teacher's personality upon the plastic mind of youth is one of paramount importance. Teaching should therefore carry with it a free, cheerful, happy frame of mind, a noble inspiration and enthusiasm. Chill this life-giving force in the teacher, by fettering her present and mortgaging her future, and not only the child but the man suffers from a stunted growth, and is deprived of the aim of education—the unfolding of character. Build up character, and a thirst for knowledge follows. This thirst for the higher things in life is high ambition. Infuse this high ambition into the child's soul—what is the result? Noble manhood, noble womanhood. If this result of education is the child's privilege, he should be placed under the guidance of a free, strong spirit. Plato says he that would make his child a slave should give him to a slave to teach.

The community demands a cultured teacher. Culture, however, is not acquired in a short period of time. It is a question of continuous education, of growth, of development; it requires years of cultivation of the finer taste, the finer feelings, the finer nature,—or, taken as a whole, the finer sense of things. In a word, it means strong personalities, broad-minded men and women, such as our schools need. But this development of soul-sense requires continual contact with the freer, larger thought of higher things—with things great and beautiful in literature, in art, in music, in travel, and, all-important, in environment. Hence, culture can be required only when the supply is in excess of the daily physical needs. "Deprive the teacher of the chance of culture and you deprive the child of the result of culture."

The teacher is asked to instil habits of thrift in the child, that the man, after his efficient working days, may live a life of independence. To this end the penny provident fund has been established in the schools. The teacher is expected to train the child in this moral principle of thrift, of independence—this attribute of good citizenship; yet is forced by the community to break the principle herself, and to let her own life stand out as an example, not of thrift, but of improvidence. There is not a grade teacher who, after her efficient working days, can, from the savings of her school salary, lead a life of independence. The workers of this great, silent, self-sacrificing army

should be held in esteem not only in their days of vigor but also in their days of decline; and, like army officers, should receive honorable retirement. Soldiers, many of whom have never felt the shock of battle, receive a pension and are provided with a home in their old age; yet the teachers, who have given their freshness, their strength—who have given their lives for their country, must suffer the humiliation of some form of charity. This great, silent army is lacking recruits. Do you wonder?

Teachers are forced out of the teaching profession at an age when men and women in the business world are considered in the prime. The years spent in the school room have unfitted them for other work. They have not been a part of the turbulent business stream; therefore they have not acquired the sharp, practical business mind and characteristics. At the age when they are forced out of school—with their overstrained nervous system, their idealistic attitude of mind, their school room manner and habits—it is too late to make a success of business. Thus teachers are out of school work, and at the age of successful business men and women, stand almost helpless as regards the question of earning a livelihood. To-day this phase of the question is being seriously considered by those who are planning their future means of support. If, therefore, lifework in teaching is beneficial to the school, it is necessary to provide for the teacher's future.

The teaching profession does not receive the recognition it merits, because of the tendency to look down upon the low-waged. A person is gauged, in a great measure, by his income. A good salary, a good business, immediately sets the stamp of value upon its possessor. His rise in the community follows, and he becomes a factor in the progress of affairs. Not until this stamp of value is set upon the teaching profession will the school rise to its full importance in the destiny of the state.

In 1903 the National Educational Association appointed a committee, of which the Hon. Carroll D. Wright, former United States commissioner of labor, was chairman, to investigate the question of teachers' salaries in this country. In 1905 the committee made its report. In forty-four of the forty-eight large cities investigated, the elementary teachers received less a year than the municipal street laborers.

As women form the greater part of the teaching force of this country, the salary of the woman teacher alone is taken as a standard of comparison. Out of the 14,659 teachers in Wisconsin, 12,908 are women, making a retirement fund movement in this state, as well as throughout the country, mainly a woman's problem.

It is a lamentable fact that the average grade teacher in Wisconsin does not receive the wage of a domestic servant. In this state there are 553 teachers who receive less than $17 a month and 2300 teachers who receive $20 and less a month. This is counting twelve months in

the year, as a teacher, too, has to live twelve months in the year. The average monthly salary of the woman teacher of this state, counting twelve months, is $38.28 Her bare living expenses—room, board and laundry—amount to about $28 a month, leaving her $10.28 a month for clothing, books, carfare, necessary travelling expenses, social duties, sick fund, summer school, institutes, state associations, provision for the future, and other innumerable necessities. The average wage of the domestic servant of this state is $4.00 a week, or $17.33 a month, to use as she sees fit, her living expenses—room, board, and laundry—having already been provided for. Thus there is a difference of $7.05 in favor of the servant. Furthermore, the servant is not expected to be a cultured person, spending years and money upon her education in fitting her for her position; nor is she expected to dress well, buy books and magazines, attend summer schools, institutes, and state associations, or to travel as a means of culture. The domestic servant with her $17.33 a month, and the comparatively small demands made upon her purse, has a chance to provide for her future; but the $10.28 a month of the teacher must multiply like the loaves and fishes to cover all that is expected of her, not including a future provision.

It has been said that teachers, like other wage-earners, should be able to save enough for the future out of their earnings. With their scanty means they cannot live even up to the daily needs without exercising constant self-denial. Where, then, is the possibility of a future under such conditions? William E. Curtiss of *Record Herald* fame, who has evidently made a study of the teacher's situation, says there is no wage-earner of whom so much is expected financially as of the teacher, and who is, accordingly, so underpaid.

It has also been remarked that teachers might find employment during the summer vacation to help make up the deficiency in their school salaries. Let us look at the advisability, the possibility, and the justice of this side of the question.

1. Part of this vacation, as the large attendance of our normal and university summer schools will certify, is devoted by many to study or preparation for the coming school year. This season is also the teacher's only chance for a little sight-seeing, so much desired by the school. Besides, school service carries with it a greater nervous wear and tear than most other work; therefore, after the year's strain in the schoolroom, the teacher requires more time for rest and recreation than most other workers in order that during the coming year she may be of value to the school.

2. The summer months are not astir with the rush of holiday activity. The business world is taking advantage of this dull season by giving employees their necessary vacations and, to the credit of the employers, generally on full pay. Where, then, could teachers, during this time of general business relaxation and inertia, find employment?

3. Should the schools be conducted on the unethical principle of draining the strength and vitality of its teachers, and should the teachers then be expected, during their vacation periods, to seek additional means of livelihood to fill up the financial gap made by the schools? The character of the teacher's presence conveys suggestions and impressions, which are assimilated and woven into the character of the child. Her magnetism, her vigor, her freshness of mind and spirit, or her coldness, her apathy, her dulness, are reflected in the developing souls entrusted to her care. Is it not, therefore, imperative that in order to render service commensurate with the peculiar responsibility of her work, the teacher have periodical seasons for rest and recuperation? Deprive the teachers of their vacations, and future citizens will pay the penalty.

An increase of salaries is inevitable to meet the increased living expenses and the growing demands of the schools. It is a well understood fact, however, that teachers will never receive sufficient salaries to meet these requirements and to save enough for future independence. Therefore, in order to attract able, broad-minded men and women who love the work, and who are willing, if they receive fair treatment, to sacrifice larger opportunities for the educational field, the teachers should receive salaries which will enable them to live up to the requirements of the schools; and should also be assured a living, through an annuity, after a life-time of faithful, efficient service.

Within the last ten years living expenses have increased forty per cent. Teachers' salaries, however, nave increased so little that they are virtually less to-day than ten years ago. This is the achievement of years of discussion of state as well as national associations. Teachers are losing heart, and many are leaving schools for the more promising field of the business world and for other states where a retirement fund and better salaries have been provided.

School laws are regularly being enacted raising the standard of the teacher's proficiency. If her financial welfare were equally considered, no criticism would be made. But more and more these increasing demands with meager compensation are forcing ability and trained strength into other kinds of work where continued study and rigid examinations are not required in order to retain the position, and where better pay is enjoyed. Asking much and giving little is the injustice sapping the strength of the public schools.

Twenty years ago teaching was the only high-class profession open to women. To-day the business world has become a strong competitor to the schools; not only stenography, journalism, and library work are open to women, but all professions likewise. Here strong, capable young women with trained minds have a chance to rise above the wages of domestic servants.

This exodus leaves the two extremes of the teaching force weak. At the one end are the young and inexperienced, who, just when they are beginning to be good teachers, leave the work. At the other end are the incapacitated who for the sake of support are obliged to remain in the service. Strengthen these two extremes, by retaining the former and retiring the latter, and the whole teaching force is enriched. Last winter at one of our hearings a city superintendent said that he felt a school-building was in safe hands, and could not very well go wrong, when it contained several teachers of ten or more years' experience. Therefore, to retain the experienced teachers, as well as to retire the mentally and physically depleted ones, should be the aim of the state.

President Vreeland, the reformer of the Metropolitan Traction Company of New York City, says that "the square deal in governing the men is necessary in order to secure their loyalty and their efficient service."

Give the teachers of Wisconsin that which they have never had, "the square deal," and the schools, too, will enjoy the benefit of loyalty and efficient service.

In signing a contract with the public schools, the teacher is virtually signing away the support of her declining years, and is also binding herself to a parsimonious, worried daily existence. To-day ability can reap a better harvest than this; hence the lack of recruits and the falling off of active workers. Every year in this state one-third of the force, or about five thousand teachers, leave the work. The average time spent by the normal school graduate in the public school work of this state is between four and five years. Some, it is true, leave for homes of their own; but the great majority leave the schools, as has already been stated, for more lucrative employments and for other states where their future is secured. Superintendents from such states come yearly to our normal schools to secure the best of the graduating classes.

We have eight normal and twenty-three training schools. There is no state in the union, it is claimed, so liberally supplied with normal and training schools as Wisconsin. There is no state in the union that has, in comparison, so inadequately provided for retaining the professional service of the graduates of these state institutions as Wisconsin has done. Is it good business on the part of the state to allow other states and other vocations to allure its best normal and training school product, and to let such competitors reap the benefit of the investment made especially for our public schools?

On economic grounds alone, the state cannot afford to suffer such a loss from so large a yearly investment as the support of these state institutions requires. Its first object should be to get good interest out of this investment, by offering, like its competitors, sufficient in-

ducements to retain this outflowing strength for the particular purpose for which it was educated and trained—the public schools of Wisconsin. A retirement fund thus becomes a matter of business expediency on the part of the state; it is an inducement made by the state to attract and retain efficiency in the teaching force.

Ten cents for each person of school age, from that portion of the common school fund known as the seven-tenths-mill tax, would be a small amount invested by the state in proportion to the returns it would receive. Neither would this amount be a drain upon the seven-tenths-mill tax, because this tax increases yearly as the valuation of the taxable property of the state increases. Last year this school tax yielded the state $155,583 more than in any preceding year. In a district where there are twenty persons of school age, ten cents for each such person would mean that two dollars would be the total yearly contribution of such district toward the retirement fund. Such individual contributions are insignificant in themselves; yet their aggregate would be sufficient to assure the establishment of a retirement fund system for the public schools of this state. The basic principle of such a system is the betterment of the child's school conditions. The welfare of the teacher and the welfare of the child cannot be separated. They are one.

A retirement fund system for teachers is advocated by such leading and distinguished educators and thinkers as Dr. Eliot, former president of Harvard University, who believes "such a general system for teachers' pensions to be comparatively near." Harvard has enjoyed the benefits of such a system for many years. Dr. Eliot therefore speaks from experience and conviction as to the expense and value of a retirement fund to the school, when he says,

"Owing to the fact that teachers who are retired are replaced by younger men at lower salaries, the real burden of the pension is light, and the general effect on the teaching efficiency is so marked as to make the expenditure in the nighest sense a frugal and economical one."

It is generally true that the older teachers receive the higher salaries. On account of this saving in the difference of salaries between the older teachers retiring and the younger ones taking their places, the state or community will really not contribute ten cents for each person of school age, for this saving in salaries makes the fund almost self-supporting; and thus it makes the business side of the question for the state more important still—large returns upon small investments, instead of small returns upon large.

The East is fully alive to this situation. It is educated up to the value of a retirement fund for its schools, and considers it a necessary adjunct to its educational system. Massachusetts, Connecticut, Rhode Island, Pennsylvania, New Jersey, Maryland, the District of Columbia,

Virginia, and Ohio, in the East, Utah, Nebraska, and Minnesota,—besides many individual cities from New York to San Francisco—of which Milwaukee is an example——have adopted such a system for their schools. Other states, among them Illinois, are planning one for the near future. Many universities, including the University of Wisconsin, are enjoying the benefit of a Carnegie fund. Unlike our plan this is purely a pension system, and is supported exclusively by the benefactor.

More than seventy large industrial concerns,—such as the United States Steel Corporation, the Standard Oil, and the International Harvester Company, have adopted pension systems for their working forces admittedly for the benefit of the company, and are supporting the fund entirely from the earnings of the company. Eighteen great American railroads have also adopted similar systems.

President Vreeland, who has put in operation a pension system for the Metropolitan Traction Company of New York City, openly states that the company is deriving direct benefit from the "change of feeling" that has taken place in the working force through a provision for its future. Worry and dissatisfaction have been replaced by contentment and also by the stimulated interest in the affairs of the employer. Through this surety for the future, new strength is attracted, experienced strength is retained, and waning strength is retired. This automatic sifting, which makes for efficiency in the working force, constitutes a direct financial gain to the company. President Vreeland emphasizes the fact that he instituted such a system for the benefit of his company.

The states and places where annuity or pension systems for teachers have been tried out have also experienced direct benefit to the schools from this unity of strength and "change of feeling" in the teaching force. In their decisions the courts of New York uphold the principle of teachers' annuities. One decision says of the annuity law:

"Such statutes are designed to benefit the public service in two ways: First, by encouraging competent and faithful employes to remain in the service and refrain from embarking in other vocations; and, second, by retiring from the public service those who, by devoting their best energies for a long period of years to the performances of duties in a public office or employment, have, by reason thereof or of advanced age, become incapacitated from performing the duties as well as they might be performed by others more youthful or in greater physical or mental vigor."

In the East, where the annuity system for schools originated and where it has had its greatest growth, its value is so highly appreciated that in a number of states the fund is maintained entirely by the state or community, which makes it a direct pension system.

To summarize: the largest business concerns, the best school-centers, and the courts, seem to agree wholly as to the immediate benefit of such a system to the service.

Germany respects her teaching force as she respects her military force. She looks upon both as armies, serving the country; both are necessary as safeguards to the nation. If she would have a strong army, she must have strong, intelligent recruits; if she would have a strong nation, the standard of citizenship must be kept up. For this supply to army and state, she looks to her schools. She recognizes the fact that the foundation of the nation is the school; therefore she retires her teachers with the same honors as her army officers, and both are pensioned directly by the Government. Through this respect shown the educator, the profession in Germany is made a life work by those who enter upon it. Permanency in the teaching force is one of the main reasons for the soundness and thoroughness of the German schools. The veneration for education—from the industrial to the cultural—has made Germany the nation it is to-day.

Indianapolis bears the reputation of possessing exemplary public schools. Their high rank in the educational system of this country is due, it is alleged, to expert supervision, especially in the primary grades.

To execute fine workmanship, the skilled artisan must have the proper tools. To carry out the plans for improvement, to raise the standard of the grades, the expert supervisor must have the assistance of competent teachers. The superintendent of the Indianapolis schools appreciates this fact. He knows that in order to attract and retain a strong teaching force, and to get the greatest efficiency out of this force, he must do justice to his teachers; must treat them as educators, realizing that every thinking teacher is an educator, meeting the knotty problems not alone in theory but in actual, practical work. Consequently, to further the aim and end of the school,—namely, the development of the child,—he has striven to improve the welfare of his teachers through higher salary standards and a retirement fund system. Owing to his hearty co-operation and incessant labor in the legislature—leaving himself alone out of the benefits of the bill—the Indianapolis schools to-day enjoy one of the most comprehensive retirement fund systems in this country. This system, to a large extent, we have used as a model for our bill.

It is, therefore, its superintendent's broad conception of the educational situation, together with his moral courage and unselfish devotion in rescuing the schools from this mistaken idea of cheap teachers as a matter of public economy—it is this "square deal" to the teachers, resulting in a high standard of efficiency in the teaching force (without which the efforts of the expert supervisor would fail to score success), which has been the main factor in placing the In-

dianapolis schools in the foremost ranks of the educational system of this country.

The prosperity of the schools can be increased only by a systematic effort to increase the prosperity of its teachers. See your teachers prosperous and you will see your schools prosperous. Let Wisconsin emulate this example of the schools recognized as leaders; and she, too, may one day stand foremost in the ranks of common school education—in the upbuilding and the uplifting of the masses.

A state retirement fund makes a compact whole of the educational system of the state, centering the interest upon the schools of no one given locality, but upon the public schools of the state as a unit. The fact that country and village teachers will enjoy equal privileges with city teachers, in a provision for the future, will attract better teachers of rural schools, and will promote permanency by lessening the tendency to gravitate toward the cities.

On account of the constant interchange between rural and city residents, the schools should stand in close relationship to each other. The child living within a few miles of the city should have the same opportunity for a liberal education as the child in the city.

A state retirement fund would be an important step in raising the standard of the rural schools, as was the case in California through equality of salary. In California equality of salary brought the standard of the rural schools, it is said, up to that of the city schools, because the rural teachers, receiving the same salaries as the city teachers, are willing to sacrifice city attractions for country savings.

Under our state retirement fund bill a teacher may become entitled to the benefits of the fund after twenty-five years of service as a teacher, of which eighteen years must have been spent in the public schools of Wisconsin. Since the provisions of the bill do not require that the whole of these eighteen years of state service be given to any one school or locality, such a state system will tend to distribute the strength of the teaching force more equally throughout the state—in rural districts as well as in other communities—than would be the case under a city system which confines the teacher, if she wishes to become eligible to the fund, to certain given communities. Thus under a state system, the state as a whole receives the benefit and not a few communities only as under an exclusive city system.

A retirement fund does not tend to keep salaries down. On the contrary, it tends to advance them. Such a movement seems to arouse the intelligence of the community as to existing conditions and needs of the school. This has been the experience generally where such a system has been established. To-day Milwaukee enjoys a retirement fund and twelve months' pay, both of which were established during the past year. This twelve months' pay practically means a yearly increase of two months' salary.

Our teachers' insurance and retirement fund is not a pension system. If it were, the fund, as in some states, would be provided and maintained entirely by the state. As our bill stands, the state contributes about one-third of the amount and the teachers two-thirds. Thus, through this mutual support, the system is based on an insurance principle. The teacher insures against disability and old age; the state, against the decline of the educational system.

The constitution of Wisconsin is said to be patterned after the constitution of the state of New York. This summer I had occasion to examine some of the New York court decisions upon this question of teachers' annuities, and was gratified to find that the New York courts, both the circuit and supreme benches, upheld the point we contended for in the legislature last winter, and which the following extract from one of these decisions will explain:

"These annuities, after the expiration of the period of active service, are not gratuities, but are in the nature of compensation for the service previously rendered, for which full and adequate compensation was not received at the time of the rendition of the services. In other words, it is in effect, pay withheld to induce long-continued and faithful service."

Membership in our state retirement fund is optional with all teachers who are in the public school service when this bill becomes a law. Such teachers will have two years' time in which to decide whether or not they wish to become eligible to the benefits of the fund. The teacher who enters the public school service after the enactment of the law becomes a member of the fund by virtue of her appointment as teacher. This condition, regarding the incoming teacher, is one in general effect throughout the country, wherever such an annuity system has been established.

The school exists that the child may be educated, not that the teacher be supported. Any person who uses our noble profession merely as a bridge to tide him over into another profession or employment should pay toll for crossing this bridge. This is just toward the school and just toward the men and women who would make teaching their life work. If we would have strong schools, our educational system should be founded, like that of Germany, on the rock of permanency; should be built for lifework, and should not be made a stepping-stone for other vocations.

The interest young teachers have shown in the success of the bill has been one of the encouraging features of this movement. They undoubtedly do not expect to teach that infinite stretch of twenty-five years or more. What young woman, full of buoyant life and hope, ever could project herself along this awesome vista of continued self-support? But nevertheless, these young teachers see the value of

such a law for teachers who continue in the work. "A retirement fund is the teacher's due and the community's protection."

Membership in a retirement fund is a safeguard for future existence, as a policy is a safeguard against financial loss for the policy holder. A man insures his dwelling against fire in order that he may be reimbursed, should he sustain such a loss. He does not insure because he hopes or looks for such disaster, but against the possibility of it. The teacher who becomes a member of the fund and remains in the work the required number of years insures her future against care and want. The few dollars contributed yearly toward the fund are well invested; they have no value as compared with the surety of comfort they promise in the possible days to come, to say nothing of the compound interest of peace they bring while still in active service. So wonderful is the quick succession of years that the young teacher who expected to remain in the work a few years at the most finds herself, before she realizes it, nearing the last milestone.

Now, a few words concerning the relation of the state bill to Milwaukee. If this bill becomes a law, Milwaukee, like Boston, Philadelphia, and New Jersey, will enjoy the benefit of a double annuity system for its schools. The two laws will fit into each other. Upon resignation from school service, the teacher, under the Milwaukee law, gets back all she contributed to the fund, losing nothing; under the state provision, she gets back half the amount. Consequently, the Milwaukee teacher loses no more than a teacher under the state law only; yet, at the same time, may enjoy the benefit of the two funds, which means a twofold annuity. What a comforting prospect for the teachers of our metropolis, and what a fine prospect for her schools!

On account of the generally low salaries in the state, we cannot assess the teachers under the state bill as heavily as Milwaukee assesses her teachers. Hence, to safeguard the fund, the state, upon the teacher's resignation, cannot afford to refund more than half.

We warmly appreciate the enthusiastic support given this movement by two of Wisconsin's long-tried educators, both of them members of the Wisconsin Teachers' Association and of the Legislature of 1909. I refer to the Honorable C. F. Viebahn and Senator Hazelwood. We also appreciate the hearty coöperation of Senator Stout, recognized throughout the state as a staunch friend of progressive education. We had so many friends in the legislature that I wish there were time to mention them all and to give each one his deserved praise. It must suffice to say that the Legislature of 1909 will ever be distinguished for its friendliness toward broad educational movements and for its deep interest in the welfare of the greatest of all schools—the public school.

Our bill was one of the chief measures brought before the last legislature. It provided for a new state institution, and undertook to lay

foundation for a more thorough public school system. No important movement has ever taken place without some opposition. The opposition to our bill, however, was so comparatively slight that it seemed insignificant beside the warm interest and hearty coöperation we met with among our citizens generally. Everywhere our cause found appreciative friends. From Mr. Charles P. Cary, State Superintendent of Public Instruction, we received our initial encouragement and support. And, for example, such friends as we found in Judge Sanborn of the United States District Court, who gratuitously drew up our bill—just such friends we met on every side—friends who were willing to help and who did help. For five consecutive weeks, without remuneration, Mr. Michael Laffey of Milwaukee worked for us in the legislature. Dr. Charles McCarthy of the Legislative Reference Library and the law firm of Bird, Harper, and Reynolds, also rendered us valuable service. The *Wisconsin Journal of Education* helped to arouse interest throughout the state. The active interest of our city and county superintendents in the success of the bill was invaluable to the movement. To sum it all up: the combined influence of the friends we found among our citizens, our educators, and our legislators, carried our bill through both houses of the legislature and as far as the executive office, where it met with the Governor's veto. The Governor explains that his objection to the bill was based upon the condition of the amendment. The amendment provided that the retirement fund be assisted by a direct state appropriation, instead of by a contribution from the seventenths-mill tax as provided in the bill before it was amended by the Assembly. This change in the bill, the Governor says, was the cause of the veto. In the revised bill we have met the Governor's objection. As the bill now stands, the state will contribute toward the fund from the seventenths-mill school tax as provided in the original bill.

In a recent issue the *Wisconsin Journal of Education* states that Governor Davidson favors a pension for teachers. Now, therefore, if Governor Davidson has this broad-minded interest in the welfare of the public school, will he not gladly, during the coming winter, include our revised teachers' insurance and retirement fund bill in his call for the special session?

Last January in his message to the legislature the Governor recommended industrial insurance for the state, which, if it carried, would also have entailed expense to the state. If this bill becomes a law in the special session, Wisconsin will be the pioneer in such a system in this country. Educational insurance has been established in this country for nearly twenty years. Its merit has been tried out and proved; hence it should certainly take rank with the untried industrial insurance. If the Governor of Wisconsin values education as he values mechanical labor, the two bills providing for industrial in-

surance and educational insurance will both receive legislative consideration in the special session this winter.

In conclusion: teachers are not a self-asserting body. Their education has raised them above the plane of the striker. Rather than strike for higher salaries, they quietly leave the profession, making the schools and not themselves the losers. Like Ibsen's Peer Gynt, they have been going around this "Great Boyg" in the public school system, lacking the moral courage to uncover the truth. Until to-day our citizens have not understood, have not been alive to the real situation of the teacher. They are generally interested in improving the teacher's condition, in providing for her future, because they know that justice toward the teacher means justice toward the child.

Powers unfold and love grows and expands in an appreciating environment. As Emerson says, "Our intellectual and active powers increase with our affection." The child is the reaper of this intellectual activity, of this sunshine of love and richness of spirit in the teacher. But a burdened mind is subversive of such results. Care for the future is the evil gnawing at the heart of our educational system. To quote Emerson again: "That which we are we shall teach, not voluntarily, but involuntarily."

The oppressed condition of the thirteen colonies was the smouldering flame that caused the Revolutionary War. From these ashes of bondage and injustice rose a great nation with "Liberty and justice for all" emblazoned on its banner. The oppressed condition of the teaching force is the smouldering flame that is bringing about a revolution in the educational system of our country. From these ashes of bondage and injustice, we see slowly rising an institution for the uplifting of the masses, which shall be worthy of its mission, worthy of the great nation which it represents. Clearer and clearer we see "Liberty and justice for all," uniting school and state in one complete whole—the children of to-day and the citizens of to-morrow.

Thinking and dreaming alone have never turned the wheels of progress. They are but the inspirers of action. Then let the years of our meditation and dreaming ripen into activity; and, girded with the armor of conviction and decision, let us march onward to the accomplishment of the higher ideals of the public school and make it, in the true sense of the word, a great institution and the glory of the state.

STANDING RULES OF THE EXECUTIVE COMMITTEE.

Art. I. The Secretary shall keep the records of the Committee in permanent form, and shall send a copy to each member within ten days after the meeting.

Art. II. The Secretary shall submit at the regular meeting following the annual session a complete financial statement in the form as published in annual report, 1907. Daily sessions of the Committee shall be held during the general meeting at a time and place to be announced in the program.

Art. III. The Secretary shall submit to the Executive committee, at the meeting following the annual session, a classified list of members as follows:

(1) List of members paying a fee of one dollar, grouped geographically and arranged in alphabetical order.

(2) List of members paying fee of fifty cents, arranged in the same manner as above.

(3) A summary of both lists.

Art. IV. Blank membership certificates and attached stubs shall be numbered consecutively and bound in groups of five (5). A report of the distribution and collection of the same shall be made by the Treasurer in the following form:

No..... To Whom Given.....Returns: Men, ...; Women, ...; Cash, ...; Blanks, ...

Art. V. All payments of expenses shall be made by checks. For purposes of auditing there shall be presented to the Executive committee the following vouchers: the bill, the order, the cancelled check, or the receipt.

Art. VI. There shall be prepared at the first regular meeting of the Executive committee an estimate of expenses of the various features of the program.

Art. VII. The Treasurer shall have printed tickets of admission to lectures and general sessions for persons not members of the association, at the rate of twenty-five (25) cents, and a report and return of same shall be made to the Executive committee.

Art. VIII. The outgoing Treasurer at the time of submitting his records for final approval of the Executive committee, shall deliver a certified check in favor of the incoming Treasurer, for the balance in the treasury.

Art. IX. A meeting of the Executive committee shall be called by the Secretary upon order of the President of the association, or upon a written request, signed by two members of the Executive committee.

Daily sessions shall be held during the annual meeting, at a time and place to be announced in the program.

Art. X. In order to secure unity in the program of the W. T. A., and to obviate overlapping and repetition of topics in the various sections, there shall be held, upon the call of the President, but not later than May 1 of each year, a conference of all chairmen of sections at a place most convenient to the persons interested. At this conference, Chairmen shall present to the Executive Committee, tentative programs, but shall not have decided finally upon any particular person or subject for their respective programs, but shall suggest appropriate subjects and name several persons to discuss each subject. The Executive Committee and the Chairmen shall then determine upon subjects for discussion, and the speakers for each program.

Art. XI. A copy of the preliminary program of every section must be in the hands of the President at least sixty days before the Annual Meeting, and a copy of the complete program must be in the hands of the General Secretary at least forty days before the Annual Meeting.

Art. XII. Each section chairman shall submit an itemized statement of expenses of his section, together with the necessary vouchers, within thirty days after the Annual Meeting. The statement shall be made in the form adopted by the Executive Committee, and shall be filed with the Secretary.

FINANCIAL STATEMENT.

RECEIPTS.

Membership:			
Men, 885	$885 00		
Women, 4,067	2,033 50		
		$2,918 50	
Duplicates.		33 00	
Tickets		80 25	
Donations and subscriptions:			
Boston Store.	$45 00		
Gimbel Bros.	50 00		
T. A. Chapman Co.	50 00		
Espenhain Co.	30 00		
Schuster & Co.	25 00		
Bunde & Upmeyer	15 00		
Majestic Theater	20 00		
Blatz Brewing Co.	10 00		
Schlitz Brewing Co.	10 00		
Pabst Brewing Co.	10 00		
Hanan & Tiedeman.	10 00		
Browning King Co.	10 00		
Alsted Kasten Co.	10 00		
Edmund Gram	10 00		
Bauch Dry Goods Co.	5 00		
Lohse Bros.	5 00		
Gerretson Silk Co.	10 00		
Jas. Chacona	5 00		
John A. Dadd	5 00		
Wm. R. Cundall	5 00		
Schumacher Bros.	5 00		
De Lebin	2 00		
Hotel Men's Ass'n	125 00		
Davidson Theater	20 00		
		492 00	
			$3,523 75

Gram Piano Co. gave a discount on pianos used.

DISBURSEMENTS.

GENERAL SESSIONS.			
Lectures and expenses:			
Frank P. Sadler, lecture and expenses		$60 00	
Henry S. Curtis, lecture	$50 00		
R. R. fare Worcester, Mass., to Milw. and return	45 40		
Sleeper	11 00		
Transfers, meals on train, etc.	7 00		
Hotel	5 00		
		118 40	

Forwarded		$178 40	
Dr. Helen C. Putnam, Providence to Milwaukee and return	$49 10		
Extra fare limited one way	10 00		
Sleeper	11 00		
Cab	1 25		
Meals	8 25		
Lecture	50 00		
Hotel room	5 00		
Carriage	1 00		
Telephone	40		
		135 95	
Incidentals:			
Clara Bowen Shepard, arranging musical numbers for gen'l program		35 00	
H. Quirk, reporting general sessions	$15 00		
Transcript 33 pp.	8 25		
		23 25	
David Thomas, stereopticon, assisting H. S. Curtis		5 00	
Total general sessions			$377 60
SECTIONS.			
College, Normal, High School:			
C. E. Patzer, chairman:			
Typewriting	$1 25		
Telephone	65		
Postage	42		
Postage advanced to Mr. Bussewitz	25		
		$2 57	
W. S. McKenney:			
R. R. fare	$3 40		
Breakfast and dinner	75		
Hotel	2 00		
		6 15	
C. H. Preston, Chairman of Commercial Teachers' Conference:			
Stationery and stamps	$1 50		
Telephone	35		
		1 85	
H. K. Bassett, Secretary and Treasurer, English Conference:			
Stationery.	$7 00		
Printing	7 75		
Postage	6 00		
Telephone	75		
		21 50	
Wallace Rice, Secretary Latin Teachers' Conference:			
Stamps and envelopes.	$ 12		
Stamps and envelopes	5 31		
Paper and stencil	70		
Lists of members and letters to same	3 00		
		9 13	
C. R. Mann, Science Conference:			
Lecture and expenses		25 00	
G. M. Morrissey, Chairman of History Conference:			
Telephone	$ 85		
Postage	40		
		1 25	
Total College, Normal and High School.			67 45
			$445 05

Forwarded			$445 00
Kindergarten:			
Stella M. Wood:			
Lecture	$25 00		
Traveling expenses	17 90		
Hotel meals	2 10		
Hotel room	2 50		
		$47 50	
Total Kindergarten			47 50
Music:			
Eleanor Smith:			
Paper	$25 00		
R. R. fare	3 40		
Bus	25		
Meals	1 25		
Hotel room	2 50		
		$32 40	
Lily C. Hanson, Secretary, postage		40	
Georgia C. Hyde, Chairman, postage		1 45	
Total Music.			34 25
City Graded School:			
G. F. Loomis, telegrams		$ 70	
Orville T. Bright, lecture.		25 00	
S. B. Tobey:			
Telephone.	$1 55		
Postage.	1 20		
		2 75	
Emma J. Luebke, car fare for pupils in drill		2 50	
G. O. Banting, telephone and postage		1 98	
David Thomas, stereopticon.		5 00	
E. Carmen Savage, Secretary, postage		1 06	
Total City Graded School			38 99
Manual Training:			
Newton Van Dalsem, Chairman:			
Registered letters	$ 72		
Postage and envelopes	4 69		
R. R. fare	8 55		
Printing.	2 00		
Stenographer	50		
Hotel	75		
		$17 21	
Geo. Fred Buxton:			
Printing circular letters	$3 50		
Postage	2 44		
		5 94	
Total Manual Training.			23 15
Domestic Science:			
Elma M. Hanson, Chairman:			
Telephone, postage, etc.	$1 40		
Expenses of speakers	6 60		
		$8 00	
Total Domestic Science			8 00
State Graded School:			
James T. Riordan, Chairman:			
Postage, telephone		$1 15	
Total State Graded School			1 15
			$598 09

Forwarded			$593 09
County Superintendents and County Training School Section:			
Frederick G. Bonser:			
R. R. fare and sleeper	$15 52		
Hotel and meals	3 00		
		$18 52	
W. E. Smith, Chairman:			
Postage, etc.		2 00	
Total County Superintendents and County Training School Section			20 52
PRINTING.			
Cannon Printing Co.:			
3,400 letter heads for officers and sectional chairmen.		$10 75	
E. C. Kropp Co.:			
Printing Auditorium postals	$25 00		
Putting in packages	75		
		$25 75	
Radtke Bros. and Kortsch:			
12,000 programs	$167 75		
2,500 certificates of attendance	4 75		
		172 50	
W. D. Hoard Co.:			
150 enrollment sheets	$2 80		
10,000 annual membership cards	18 80		
1,250 envelopes.	2 95		
725 circular letters	2 75		
41 enrollment ribbons.	70		
		$28 00	
Total printing			237 00
POSTAGE, EXPRESS, FREIGHT AND TELEPHONE.			
Postage on postal cards sent in packages	$5 00		
200 1c envelopes used for enclosing postal cards	2 30		
Stamps for postal cards sent out separately	6 30		
		$13 60	
General postage for Secretary	$12 22		
Stock printing and postage:			
200 No. 10 envelopes	2 00		
200 2c and 100 1c envelopes	6 75		
		20 97	
Long distance telephone for Secretary as per itemized account, and messenger service		6 30	
Telephone rent for Secretary for 1909		15 00	
Proceedings:			
Wells, Fargo Express Co., express on packages sent out from Madison		22 16	
American Express Co., packages sent out from Madison		28 36	
Postage on proceedings		29 80	
C. and N. W. R. R. freight on proceedings from Madison to Milwaukee		7 10	
C. and N. W. R. R. freight on proceedings out into state		5 24	
			$855 61

Forwarded		$148 53	$855 61
Julius Rosenow, carting boxes from depot to house in Milwaukee	$3 00		
Delivery to 65 schools in Milwaukee	16 25		
Delivery of packages to express office	50		
Carrying from house to auditorium during convention	2 00		
Auditorium to hotel	2 00		
Hotel to house	1 00		
		24 75	
Siekert and Baum:			
Patent clasp envelopes	$5 83		
3 boxes gum labels	1 00		
		6 83	
Trip of Secretary to Madison to send out proceedings, R. R. fare	$3 36		
Hotel 1¼ days	3 00		
Parlor car and bus	95		
		7 31	
Democrat Printing Co.:			
Wrappers, boxing and cartage for proceedings	$4 50		
Freight prepaid	1 00		
Putting proceedings in envelopes	5 92		
		11 42	
Postage on programs		35 50	
Advance telephone rent for 1910 for Secretary		7 50	
Postage on membership books, circular letters, etc., sent out by Treasurer		17 00	
Total postage, express, freight and telephone			258 84
OFFICERS.			
President:			
Executive Committee meeting, Feb. 20:			
R. R. fare, Juneau to Milwaukee and return	$2 76		
Lunch	55		
		$3 31	
Executive Committee meeting April 24:			
R. R. fare.	$2 58		
Hotel and meals	3 50		
		6 08	
Executive Committee meeting May 1:			
R. R. fare Juneau to Madison and return	$2 10		
Hotel	2 00		
		4 10	
Executive Committee meeting June 12:			
R. R. fare Juneau to Milwaukee and return	$2 58		
Hotel	2 50		
		5 08	
Executive Committee meeting August 21:			
R. R. fare	$2 33		
Bus	25		
Meals	2 00		
		4 58	
Executive Committee meeting December 4:			
R. R. fare.	$2 76		
Dinner	55		
		3 31	
			$1,114 45

Forwarded		$26 46	$1,114 45
Incidental items:			
Two trips to Milwaukee for conferences with Secretary.	$12 16		
Postage, telephone and other incidentals	6 49		
		18 65	
Total President.			45 11
Secretary:			
Executive Committee meeting May 1:			
R. R. fare Milwaukee to Madison and return	$3 28		
Bus	50		
1½ days hotel	3 50		
		$7 28	
Stenographic assistance:			
Six days clerical services directing program labels and sending out circular letters	$9 00		
M. S. Peterson, writing circular letters and carbon copies of minutes of Executive Committee meeting	1 50		
M. S. Peterson, typewriting copy of program	1 75		
Hazel Scofield, 400 copies multigraph letter	3 00		
100 copies circular letter sent to officers and committees	3 00		
Alma Reineman, 2¼ days directing labels and envelopes for proceedings	2 25		
		20 50	
Expenses of trip to Madison to appear before Legislative Committee on Printing:			
R. R. fare and parlor car	$3 63		
Hotel	2 50		
One day's salary deducted by Milwaukee School Board.	4 25		
		10 38	
Trip to Marinette to consult with G. H. Landgraf, member of Executive Committee:			
R. R. fare Appleton to Marinette and return	$3 06		
Dinner and bus	75		
		3 81	
Trip to Madison to address city superintendents' meeting:			
R. R. fare Milwaukee to Madison and return	$3 28		
Side trip from Watertown to Juneau and return to consult with the President.	60		
Bus and parlor car	60		
Hotel	2 00		
		6 48	
Salary for 1909		300 00	
Office assistance during general meeting:			
M. S. Peterson in Secretary's office 2½ days during general meeting		3 75	
Rudolph Olson, errand boy during general meeting		1 00	
Siekert and Baum for ink, pens, rubber bands, carbon paper	$3 05		
1 ream typewriting paper	1 10		
1 bottle marking fluid	10		
500 No. 522 white envelopes	1 40		
3 packages gum labels	60		
1 package carbon paper and eraser	75		
		7 00	
			$1,159 56

Forwarded		$360 20	$1,159 56
Rose Slamovitz:			
Bag in which to carry records of Executive Committee		2 50	
Le Dain Stamp Co.:			
Rubber address stamps		1 00	
Trip to Juneau for conference with President:			
R. R. fare and bus	$2 75		
Meals en route	35		
		3 10	
Trip to Ft. Atkinson:			
To consult with Treasurer on membership list and balancing final statement.	$3 95		
		3 95	
Total Secretary.			370 75
Treasurer:			
Executive Committee meeting February 20:			
R. R. fare Ft. Atkinson to Milwaukee and return.	$2 30		
Meals	1 50		
		$3 80	
500 stamped envelopes printed with return notice		10 62	
Premium for bond 1909-10		8 00	
Executive Committee meeting April 24:			
R. R. fare.	$2 30		
Dinner and lunch	1 00		
		3 30	
Executive Committee meeting May 1:			
R. R. fare Ft. Atkinson to Madison and return	$1 78		
Hotel, dinner and supper	1 50		
		3 28	
Schwab Stamp and Seal Co.:			
One font No. 8 type	$ 90		
Seven 1½x2¼ rubber stamps	1 50		
		2 40	
Conference meeting with Secretary September 25:			
R. R. fare.	$2 30		
Dinner and supper	1 25		
Care fare and telephone	20		
		3 75	
Salary		25 00	
Executive Committee meeting December 4:			
R. R. fare	$2 63		
Lodging, breakfast, dinner and supper	2 75		
		5 38	
Office assistance at general meeting:			
Carrie Pashelles 2½ days	$3 75		
Martha Zenk 1½ days	1 50		
For typewriting circular letters and postage in securing return of membership books still out	5 00		
		10 25	
Money expended in refund of duplicate tickets		33 00	
Total.			108 78
			$1,639 09

Forwarded			$1,639 99
Executive Committee:			
F. S. Hyer, Committee meeting February 20:			
R. R. fare Stevens Point to Milwaukee and return	$6 10		
Hotel en route	1 00		
Hotel Milwaukee	3 00		
		$10 10	
D. H. Schuler:			
Executive Committee meeting May 1:			
R. R. fare Milwaukee to Madison and return.	$3 24		
Parlor and street car fare	90		
Meals	1 50		
		5 64	
H. C. Buell, February 20:			
R. R. fare Janesville to Milwaukee and return.	$2 86		
Dinner and supper	1 50		
		4 36	
G. H. Landgraf, February 20:			
R. R. fare, sleeper berth, Marinette to Milwaukee and return	$8 94		
Meals in Milwaukee and en route	2 30		
		11 24	
Executive Committee meeting June 12:			
R. R. fare and sleeper Marinette to Milwaukee and return	$9 04		
Hotel and meals	2 50		
		11 54	
Executive Committee meeting August 21:			
R. R. fare	$7 74		
Hotel lodging	4 50		
		12 24	
Executive Committee meeting December 3:			
R. R. fare Marinette to Milwaukee and return	$7 44		
Sleeper	1 75		
Meals	2 35		
		11 54	
Total Executive Committee			C6 66
SPECIAL APPROPRIATIONS.			
N. E. A. Appropriation:			
H. C. Buell:			
Express and postage on circulars	$ 85		
300 printed badges	4 50		
Carnations	1 00		
5 days rent of headquarters at Brown Palace Hotel.	75 00		
		$81 35	
Total N. E. A.			81 35
Committee on Proposed Change in the Election of County Superintendents:			
Committee meeting at Milwaukee, October 30 and 31:			
C. J. Brewer:			
R. R. fare New Richmond to Milwaukee and return	$12 12		
Sleeper both ways	4 00		
Meals	1 65		
		$17 77	
			$1,787 10

Forwarded		$17 77	$1,787 10
J. A. Hazelwood:			
Hotel and R. R. fare		3 00	
J. F. Sims:			
Hotel and R. R. fare		11 50	
A. M. Olson:			
R. R. fare Marinette to Milwaukee and return	$6 44		
Berth both ways	3 00		
Meals	1 50		
		10 94	
D. McGregor:			
R. R. fare	$6 10		
Hotel	2 50		
		8 60	
C. E. Patzer:			
Attending meeting of County Superintendents at Oshkosh May 29-30:			
R. R. fare	$3 24		
Hotel, bus, and car fare	7 50		
		10 74	
Total.			62 55
Committee on Legislation:			
D. McGregor:			
R. R. fare and meals	$8 10	$8 10	
P. J. Zimmers, meetings January 9 and 16	5 58	5 58	
L. W. Wood:			
R. R. fare, berth and hotel	15 22	15 22	
J. F. Sims:			
R. R. fare and hotel	12 00	12 00	
Leo P. Fox:			
January 9, R. R. fare and hotel	5 35		
December 10, R. R. fare and hotel	5 10		
February 1, R. R. fare and hotel	5 60		
March 23, 24 and 25, R. R. fare to Madison and hotel bill	10 11		
		26 16	
A. A. Thomson:			
R. R. fare and hotel	$10 59	10 59	
John Kelley:			
January 9-11, R. R. fare, hotel, meals	9 76		
February 1-2, R. R. fare, hotel, meals	8 27		
February 6-8, R. R. fare, hotel, meals	7 28		
		25 31	
S. C. Cushman:			
R. R. fare and meals	$3 86	3 86	
Fred Christiansen:			
R. R. fare and meals	6 40	6 40	
M. H. Jackson:			
R. R. fare and meals, hotel	13 16	13 16	
A. M. Olson:			
January 9, R. R. fare, hotel and berth	10 94		
February 8, R. R. fare, berth and hotel	13 44		
		24 38	
Chas. McKenney:			
February 17, R. R. fare to Madison, hotel	$6 49	6 49	
O. E. Wells:			
February 8, R. R. fare, hotel and sleeper	14 90	14 90	
			$1,849 65

Forwarded		$172 15	$1,849 65
John Callahan:			
January 9, R. R. fare and meals	4 74		
February 8, R. R. fare and meals	4 74		
April 30, R. R. fare and hotel	7 46		
		16 94	
C. J. Brewer:			
January 9, R. R. fare, hotel, berth, etc.	$18 12	18 12	
C. E. Patzer:			
Meals for meetings December 8, January 9, 30, February 6 and 7	6 05		
Typewriting and stationery	9 95		
Trip to Madison April 14-15, R. R. fare, hotel.	6 63		
Telegraph, long distance telephone	11 57		
Trip to Madison, December 3 and 4, R. R. fare, hotel, etc	6 23		
February 12-13, R. R. fare, hotel, etc	7 88		
March 3, R. R. fare, hotel, meals, etc.	6 38		
March 25-26, R. R. fare, hotel, extra meals	8 58		
Carbon copies of bills, incidental telephones, car fare	5 85		
December 2, 3, 4, attending meeting of special legislative committee	4 35		
Painters' cloth, paint and brushes, 3 copies Year Book	4 67		
Legal opinion on constitutionality of Co. Superintendency Bill	10 00		
B. A. Rice:			
Plate used at Auditorium and slide	3 50		
Carpenter work, Auditorium	1 00		
Balance on hand.	15		
		$92 79	
			300 00
Council of Education:			
W. J. Hamilton:			
Attending meeting May 29		$3 75	
John A. H. Kieth:			
Attending meeting May 29:			
R. R. fare	$3 24		
Carriage	50		
Luncheon	75		
		4 49	
E. C. Elliott:			
Attending meeting May 29:			
R. R. fare	$3 28		
Parlor car	70		
Meals	1 25		
		5 23	
Selma Klein:			
Stenographic services during convention		3 50	
Total.			$16 97
SUNDRIES.			
Rent:			
Wisconsin Conservatory of Music, rent for hall November 12 and 13, 1908		$20 00	
Auditorium		600 00	
Davidson Theater		50 00	
			$2,166 62

Forwarded		$670 00	$2,166 62
Bureau of Information:			
Wm. F. Sell, Chairman:			
Salary	$25 00		
Filing cards	50		
Postage	42		
Telephone	55		
Register, file, date pads, etc	3 05		
Lunches for guides	2 00		
Assistants in office	3 00		
Car tickets for guides	12 00		
Advertising:			
Journal	1 89		
Germania	2 10		
Evening Wisconsin	1 45		
Sentinel	3 00		
Daily News	1 50		
		56 46	
Local Committee:			
Kowalsky Hardware Co.:			
7 rolls building paper and 1 ball twine		4 33	
O. G. Gilbert, chairman:			
Postage	$ 70		
Telephone	4 05		
Assistant's salary November 4 and 5	5 00		
		9 75	
Frances Walsh:			
Carting platform from 2nd District School to City Hall and return	$2 00		
Returning Kg. chairs used at City Hall	1 00		
Services of City Hall janitor	3 50		
Repairing platform belonging to 2nd District School	4 68		
		11 18	
Clement, Williams & Co:			
200 chairs		7 00	
Edlefsen Leidiger Co.:			
Flowers for decoration at Auditorium and Davidson		13 12	
C. F. Kramer Sign Co.:			
48 card signs, 35 cents each	$16 80		
2 cloth signs	2 00		
Blank cards	1 00		
		19 80	
O. G. Gilbert:			
Cartage on Kg. chairs from 7th District School to City Hall		1 00	
Lightning Mess. & Exp. Co.:			
Carting anvils and hammers to Aud.		1 00	
Incidentals:			
Spencerian Business College:			
Girls for checking ballots:			
13 girls at $1.00 and care fare	$15 60		
1 girl, 2 days assist at headquarters	2 40		
		18 00	
Flowers		5 00	
Gram—Rent of pianos for general and sectional meeting		27 00	
Total sundries			843 64
Grand total			$3,010 26

DISBURSEMENTS.

General sessions		$377 60	
Sections:			
College, Normal and High School	$67 45		
Kindergarten	47 50		
Music	34 25		
City Gr.	38 99		
State Gr.	1 15		
Manual Training	23 15		
Domestic Science	8 00		
Co. Supts. and Co. Tr.	20 52		
		241 01	
Printing		237 00	
Postage, Express, Tel.		258 84	
Officers:			
President	$45 11		
Secretary	370 75		
Treasurer	108 78		
Ex. Com.	66 66		
		591 30	
Special Appropriations:			
N. E. A.	$81 35		
Committee on Legislation	362 55		
Council of Education	16 97		
		460 87	
Sundries:			
Hall rent	$670 00		
Bureau of Information	56 46		
Local Committee	67 18		
Incidentals	50 00		
		843 64	
Total			$3,010 26

SUMMARY.

Balance on hand February 28, 1909		$848 29	
Receipts for 1910		3,523 75	
			$4,372 04
Disbursements.			3,010 26
Balance.			$1,361 78

JOHN KELLEY,
President,
G. H. LANDGRAF,
M. V. O'SHEA,
KATHERINE R. WILLIAMS,
Secretary.

LIST OF MEMBERS OF THE WISCONSIN TEACHERS' ASSOCIATION.

MEN.

ACKERVILLE.

Koerble, Herman.

ADELL.

Stokdyk, Harvey.

ALBANY.

Schultz, A. O.

ALBION.

Holum, J. O.
Ringoen, Theo.

ALGOMA.

Eichinger, J. A.

ALLENTON.

Becker, Alfred.
Roecken, Otto.

ALMA.

Liebenberg, H. H.

ALMOND.

Briggs, Earl.
Gustin, Fred.
Priest, E. F.
Scott, Leland.

AMBERG.

Skowlund, W. N.

AMERY.

DeGuire, Geo.

AMHERST.

Een, Andrew P.
Hefferman, J. E.

ANTIGO.

Bridgman, Robert.
Coudie, Robert.
Hickok, N. H.
Hinderman, E. A.
Kavanaugh, C.
Rome, M. H.

APPLETON.

Bailey, Dana.
Blankenagel, John.
Faulkes, W. F.
Graber, J. W.
Keller, Paul G. M.
Lewis, A. M.
Meating, A. G.
Newberry, David.
Nicholas, Wm. J.
Plantz, S.
Treat, Chas. W.
Wilson, John.
Winsey, W. F.
Young, F. T.

ARBA VITA.

Prior, E. H.

ARGYLE.

McDonnell, W. E.
Fredinnick, C. E.

ASHLAND.

Blanchard, Clarence.
Crothers, H. B.
Eddy, R. E.
Greenwalt, W. C.
Hooper, Sup't J. T.
Lorscheter, J. M.

AUGUSTA.

Hatch, L. C.
Scott, Walter A.

BARABOO.

Chamberlain, H. R.
Hindes, E. L.
Mothersill, Mark H.

BARRON.

Cheney, Sellen Sterling.

BAYFIELD.

Stahl, H. V.

BEAVER DAM.

Honnold, J. G.
Scholz, R. P.
Nelson, J. T.

BELLEVILLE.

Steil, W. N.

BELOIT.

Burr, A. W.
Chapin, R. C.
Chase, T. H.
Converse, F. E.
Deane, J. P.
Eaton, Edw. D.
Norris, John.
Pierson, John C.
Robinson, R. P.
Sheldon, Walter.
Van Plew, John H.

BERLIN.

Anderson, W. T.
Packard, Edgar.
Thompson, Leland R.

BLACK EARTH.

Green, F. B.

BLACK RIVER FALLS.

Hennessey, D. L.
Stiehl, Oren D.

BOLTONVILLE.

Haufschild, H. C.

BOSCOBEL.

Knoelk, Wm. C.

BRANCH.

Moldenhauer, C. J.

BRANDON.

Lee, Oscar.

BRILLION.

Simon, A. L.

BRODHEAD.

Briggs, Howard.
Laube, Herbert D.
Phillips, Leslie A.

MEMBERSHIP LIST—MEN—Continued.

BURLINGTON.

Carter, H. M.
Miller, J. S.
Smith, Dean S.

CAMBRIA.

Cody, U. T.

CAMBRIDGE.

Field, A. M.

CASHTON.

Bray, Frank C.

CEDARBURG.

Buscheck, Alfred J.
Dineen, C. R.
Fromm, Wm. H.
Grasse, A. E.
Patterson, Walter L.

CHICAGO.

Berry, B. D.
Cotton, H. E.
Crawford, R. S.
Davis, A. A.
Farr, F. D.
Halsey, H. R.
Lobaugh, E. D.
Lyons, J. A.
Mann, C. Riborg.
Mannasse, F. L.
Williams, J. D.

CHILTON

Fox, Leo P.
Luther, Chas.
Morrissey, G. M.
Thiel, John.

CHIPPEWA.

Brunstad, Albert.
Hawes, W. C.
Schwartz, G. W.
Wilmarth, Dr. A. W.

CLINTON.

Reese, Spencer P.

CLINTONVILLE.

Ehart, Guy.
Kneip, F. L.
Switzer, W. E.

COBB.

Lamb, C. E.

COLEMAN.

Geisner, Max.

COLGATE.

Beger, H. W.

COLUMBUS.

Joyce, Martin.
Perry, R. S.
Thomas, S. M.
Thompson, Fred.
Westgate, C. E.

CASCO.

Koss, Jos. H.
Lawler, P. H.

CUBA CITY.

Ralph, F. E.

DALE.

Balliet, Leo M.

DARIEN.

Bartelt, F. O.

DAUMAN.

Bishop, E. A.

DEERFIELD.

Lee, Emil.
Oldenburg, F. W.

DEFOREST

Meland, E. C.

DELAVAN.

Bassford, George.
Cochrane, W. A.
Congdon, H. A.
Gregory, Seth W.
Melcher, H. A.
Walker, E. W.

DE PERE.

Bishop, Chas.

DODGEVILLE.

Homuth, Erwin.
Kircher, H. W.

DARLINGTON..

Mase, W.

DRUMMOND.

Scott, Edwin.

EAGLE.

Compior, T. H.

EAST HAMPTON, N. Y.
Dayton, E. H.

EAST TROY.

Wiesend, W. T.

EAU CLAIRE.

Clark, W. A.
Frawley, M. S.
Schultz, W. H.

EDEN.

Scannell, Angelo J.

EDGAR, WIS.

Gressel, J. E.

EDGERTON.

Gile, B. M.
Raethe, E. L.

ELKHORN.

Austin, Carl N.
Dixon, John.

ELKHART.

Dornbush, H. C.

ENDEAVOR.

Vaughn, H. E.

EVANSVILLE.

Baldwin, J. B.
Lowth, Frank J.
Waddell, J. T.

FALL RIVER.

Hulse, L. J.

FENNIMORE.

Zeidler, Richard.

FLORENCE.

Jones, Lewis A.

FOND DU LAC.

Craine, Edward P.
Hubbard, I. O.
Jones, Thos. L.
Slocum, P. W.
Smalley, D. H.
Wall, S. F.
Welson, E. J.
Woodword, A. C.

FONTANA.

Wood, Harrison.

MEMBERSHIP LIST—MEN—Continued.

FORT ATKINSON.

Burns, H.G.
Hagemann, J. A.
Ingham, H. G.
Stiehm, E. O.

FOREST JUNCTION.

Frautman, Henry.

FOX LAKE.

Nash, F. R.
O'Connel, W. C.
Robertson, W. B.

FREDONIA.

Jaehnig, Chas. H.
Kraus, L. G.
Wilkins, Howard E.

GALESVILLE.

Almy, H. C.

LANNON.

Stier, John P.

GAYS MILLS.

Pratt, G. E.

GLENWOOD.

Arnold, W. J.

GRAFTON.

Blank, John.
Riordan, Henry G.
Ruckweed, Martin.

GRAND RAPIDS.

Jackson, M. H.
Schwede, C. W.

GREEN BAY.

Brown, Wm. O.
Burton, A. W.
Byrnes, Chas.
Cole, C. F.
Coonen, John E.
Evarts, John.
Gunn, E. E. Jr.
Hodge, Williard W.
Novitski, J. F.
Sutton, Henry F.
Slade, Glenn.

GREENBUSH.

Konop, Jos. G.

GRIMMS.

Stoehr, Randolph.

HALES CORNERS.

Lilly, John.

HARTFORD.

Buckley, F. W.
Byrns, W. D.
Elmer, W. E.
Whelan, John.

HIGHLAND.

Hacker, H. C.

HILBERT.

Romden, V. J.

HILLSBORO.

Coates, C. I.

HORICON.

Bewick, T. L.

HURLEY.

Lennon, Chas. D.
Murphy, J. E.

HUSTISFORD.

Roll, Richard Jr.
Roll, Richard.

IRON RIVER.

Rood, W. R.

JACKSON.

Foote, J. J.

JANESVILLE.

Antisdel, O. D.
Arbuthnot. John.
Beers, Valdameer.
Brown, J. T.
Buck, E. G.
Buell, H. C.
Kundson, T. M.
Mauross, D. D.
Rahr, L. F.
Vlyman, Wm.
West, A. B.

JEFFERSON.

Bole, S. J.
Riess, Arthur.
Stengel, A. L.
Warner, J. Paul.

JOHNSON CREEK.

Logue, Elmer B.

JUDA.

Davis, James E.

JUNEAU.

Bauer, Oscar H.
Kelley, John.

KAUKAUNA.

Bunker, E. P.
Radsch, P. M.
Tontz, James G.

KENOSHA.

Betzer, E. E.
Hanaman, W. W.
Hocking, W. J.
Moun, L. J.
Randall, E. F.
Ward, S. W.
Zimmers, P. J.

KEWAUNEE.

Comins, Harry M.
Fritz, Edwin E.
Rohde, Arthur.
Sazoma, J. E.
Schultz, A. C.
Snyder, H. E.
Wochos, Stephen.

KEWASKUM.

Cavanaugh, James.
Manning, T. J.

KIEL.

Rehberg, F. H.

LA CROSSE.

Bird, John P.
Cotten, Fassett A.
Engleman, James O.
Long, Ernest G.
Sanders, Wm. H.
Sanford, Albert H.
Wreland, Otto E.

LA MONT, ILL.

Swiggett, D. W.

LADYSMITH.

Burns, R. H.
Gotham, E. C.

LAKE GENEVA.

Denison, Edmund D.
Hutton, W. C.
Schnorenberg, J. A.

LAKE MILLS.

Crump, Arthur.
Hartmon, W. C.
Hooper, J. L.
Jones, O. M.

LANCASTER.

Brockert, J. C.

MEMBERSHIP LIST—MEN—Continued.

LITTLE BLACK.

Edwards, Prin. M. M.

LODI.

Hauston, W. C.
Witherbee, O. D.

LOMIRA.

Charbornnean, J. G.

LONE ROCK.

Weiland, L. E.

LOWELL.

Corey, Silas G.

MADISON.

Barnes, V. G.
Bassett, H. K.
Bauman, M. H.
Bleyer, W. G.
Borden, J. B.
Cary, C. P.
Carney, C. S.
Dowling, Prof. L.
Wayland.
Drewry, G. H.
Dudgeon, R. B.
Elliot, E. C.
Evans, M. B.
Emery, W. E.
Fiske, Prof. G. C.
Fuller, Wm. D.
Hatch, K. L.
Hohlfeld, A. R.
Hubbard, Prof. F. G.
Hunt, W. H.
Hutchison, J. H.
Larson, W. E.
Lighty, W. H.
McMullen, Chas.
Olson, L. F.
Otis, D. H.
O'Shea, Prof. M. V.
Parker, W. N.
Phillips, Prof. J. D.
Rice, O. S.
Salisbury, Oliver M.
Sears, Prof. J. B.
Sellery, G. C.
Sharp, Prof. F. C.
Shearer, Chas. E.
Skinner, Prof. E. B.
Terry, H. L.
Tressler, N. W.
Turneaure, F. E.
Van Horn, J. L.
Van Hise, Pres.
Van Vleck, E. B.
Weber, A. W.
Whitbeck, R. H.
White, Melvin, J.
Winne, A. J.

MALONE.

Phalen, Will.

MANAWA.

Baldwin, Walter.
Hardgrove, J. H.

MANITOWOC.

Armitage, A. Wesley.
Beckwith, E. G.
Book, J. A.
Brooks, Lavern W.
Christianson, Fred.
Davies, F. W.
Jones, Orren Lloyd.
Luehr, W. H.
Meisnest, C. W.
Nims, Robert.
Reich, John.
Schade, Christ.
Steckel, Frank.
Tanghut, F. J.

MARATHON.

Schneider, H. O.
Schneiders, A. H.
Schulty, Geo.

MARION.

Mortenson, M.

MARINETTE, WIS.

Ely, J. E.
Fults, J. E.
Hauft, Frank W.
Heller, Victor G.
Kramer, Arnold O.
Landgraf, G. H.
Olson, O. M.
Savage, George O.

MARKESAN.

Cox, E. M.

MARQUETTE, MICH.

Gehrand, G. W.

MARSHALL.

Eldred, Claude H.

MATTOON.

McLaughlin, W. A.

MAYVILLE.

Keeley, L. S.

MAZOMANIE.

Parkinson, Henry G.

MCFARLAND.

Schenkenberg, Lee J.

MELLEN.

Cordy, W. J.
Hagman, W. P.

MENASHA.

Berkley, E. A.
Callahan, John.
Johnston, Ray K.

MENOMONIE.

Bowman, G. L.
Crane, F. R.
Metcalf, S. H.
Roecker, Wm. F.
Works, Geo. Alan.

MENOMINEE, MICH.

Crouch, J. B.
Shives, E. J.

MENOMONEE FALLS.

Leister, Henry C.
Witter, F. L.

MERRILL.

Cole, A. H.
Hamlin, J. H.

MERTON.

Thomas, Hale.

MIDDLETON.

Jahr, Chas. A.

MILTON JUNCTION.

Moody, Earl A.
Ray, Geo. R.
Whitford, J. F.

MILWAUKEE.

Allen, Walter.
Arneson, Ben A.
Boers, H. C.
Baker, J. W.
Balzer, Geo. J.
Bartelt, Chas.
Barth, M. D. Geo. P.
Becker, Wm.
Berg, H. O.
Betten, I. W.
Bickler, Peter.
Blaisdell, G. A.
Boren, W. E.
Boyce, Thos. W.
Briggs, Harry.
Braun, Adolph.
Brown, A. C.
Bruce, Wm.
Burrill, A. C.
Bussewitz, M. A.
Camberlain, Geo. A.
Cheever, W. H.
Clark, W. O.

MEMBERSHIP LIST—MEN—Continued.

Coblentz, H. E.
Cooke, M. H.
Cooley, R. L.
Corcoran, D. W.
Corstvet, Alexander.
Cox, James L.
Crocker, L. A.
Dallmer, Eberhard.
Darling, Wm. F.
Derse, R. M.
Diederichsen, John A.
Doerflinger, Chas. H.
Donnelly, Patrick.
Eiselmeier, John.
Engelmann, Karl.
Ericson, Henry.
Fairchild, A. N.
Fertig, C. H.
Finan, John J.
Fleischer, Herman P.
Fleischer, Henry.
Foster, John N.
Frank, D. E.
Freytag, L. P.
Fritsche, G. A.
Gass, T. H.
Gilbert, O. G.
Gillan, S. Y.
Goetz, Hans.
Gohlke, Geo. H.
Gourley, John H.
Gould, Lucius.
Griebsch, Max.
Griffin, Edward T.
Gruettner, G. Adolph.
Hahn, Wm. H.
Hahn, B. D. J.
Hamann, F.
Hardtke, A. C.
Henirich, Wm. A.
Hesse, Henry D.
Hill, H. D.
Hillenkamp, C.
Holden, Chas. B.
Horn, Van.
Horton, S. C.
Howe, W. C.
Huebsch, A. A.
Huth, Paul W.
Homer, Idle.
Jewett, Albert B.
Kagel, Albert.
Kahl, Henry.
Kelley, Frank J.
Kenney, Thos.
Katz-Miler, A. C.
Koeppel, Geo.
Kottnauer, Ludwig.
Krenerick, H. C.
Kriesel, C. A.
Kroening, Frank.
Krueger, Henry.
Krug, Richard E.
Lau, F. C.
Leadbearer, James.
Lemke, C. F.
Lenz, Geo. J.
Loeffler, Frank H.
Loeme, Arthur.
Loomis, G. F.
Losse, Herbert A.
Luehring, Henry J.
Luening, D. C.
Luening, Edwin G.
Maas, P. J.
Martens, Henry C.
Martin, L. T.
Mauer, Heinrich F.
Michelson, J. A.
Millar, Leslie H.
Mitchell, I. N.
McKeever, J. F.
McKenny, Chas.
McLenegan, C. E.
McMahon, T. Omar.
Nicolaus, R. C.
O'Hanlon, Richard J.
Olsen, Theo. B.
Otto, Wm. A.
Patzer, C. E.
Pauli, H.
Pearse, C. G.
Perry, C.
Peters, Geo. A.
Pollock, W. J.
Poppert, Gust A.
Powles, F. Stanley.
Pratt, J. Howard.
Pray, C. E.
Preston, C. H.
Promberger, Wm.
Purin, C. M.
Raeth, A.
Rahn, Dr. W.
Raynor, H. B.
Reiss, Wallace.
Riley, Jos. M.
Riordan, J. F.
Riordan, J. P.
Rostfer, C.
Ruehl, Adolph.
Ruhnke, Reinhardt H.
Sandberg, Frank E.
Sanford, E. R.
Schauerman, Carl.
Schnell, H. S.
Schoon, Wm.
Schoenig, F. H.
Schoenwetter, O. C.
Schuman, E. W.
Schuler, D. H.
Schulz, G.
Sears, C. H.
Sears, Louis.
Sell, Wm. F.
Senn, Alfred.
Shaughnessy, P. H.
Shoeffer, W. A.
Sholberg, Nichlos.
Siefert, H. O. R.
Siegmeyer, John.
Slifer, Arthur C.
Smithyman, W. L.
Somers, J. J.
Spencer, R. C.
Speerbrecher, Henry.
Spies, Geo.
Spillman, Harry C.
Stephens, W. T.
Stern, Leo.
Straube, C. B.
Studley, J. S.
Sweet, L. S.
Summons, Wm. F.
Talbert, E. L.
Tiefenthaler, G. E.
Tood, S. W.
Torney, J. L.
Torphy, Michel A.
Traeger, Ernest.
Treichler, John.
Ulrich, John.
Vanture, Lewis.
Veeder, Harold A.
Warner, Dezelle T.
Webb, Lindsey.
Wedekind, Edward.
Weihe, Herna J.
Welch, Jos. M.
Werner, F. W.
Wiemer, F. M.
Wilde, Frank.
Wilde, S.
Wilson, H. B.
Wilson, William.
Witt, Robert H.
Wood, C. H.
Worthington, F.
Zinns, Roland W.

MINERAL POINT.

Atterholt, A. A.
Loveland, R. E.

MISHICOT.

Wehrwein, George.

MONROE.

Haverson, Geo. B.
Ingold, Ferdinand.
Parks, F. G.

MONTICELLO.

Reddy, Chas.
Wills, Lellan.

MOSINEE.

Brown, A. G.

MT. HOREB.

Barkley, M.
Kelly, W. H.
Laue, John.

MUKWANAGO.

Cronin, T. T.

NAUGART.

Bubbers, W. M.

NEENAH.

Beeman, Edward M.
Van Dalsem, Newton.
Williams, F. H.

NEILSVILLE.

Jacobson, David L.
Snodgrass, G. M.
Stillman, C. D.
Wood, L. W.

MEMBERSHIP LIST—MEN—Continued.

NEWBURY.

Jordan, Rob't E.

NEW HOLSTEIN.

German, Grant A.

NEW LISBON.

Heindel, Ray L.

NEW LONDON.

McCrary, E. W.
Moss, Glenn E.
Stanley, C. B.

NEW RICHMOND.

Brewer, C. J.

N. MILWAUKEE.

Cavanaugh, Carroll.
Sievers, Peter.

OAKFIELD.

Curtis, L. G.

OAK PARK, ILL.

Elwood, E. H.

OCONTO.

M. R. C.

Mulvaney, B. M.
Steinfeldt, Chas. R.

OCONTO FALLS.

Schaub, A. E.

OMRO.

Auklam, A. R.
Mallien, Frank G.
Vittum, M. W.

OREGON.

Griffin, Warren O.

ORFORDVILLE.

Anspach, Charles.

OSHKOSH.

Baker, W. O.
Beardmore, Edwin H.
Briggs, L. W.
Cannon, J. F.
Keith, John A. H.
Mitchell, F. E.
McIver, M. N.
Neystrom, Paul H.
Nevins, Chas.
O'Neil, A. B.
Oren, Arthur L.
Patch, H. B.
Polley, H. E.
Russell, J. E.
Sage, A. H.
Summers, L. L.
Wright, Daniel H.
Yonker, H. S.
Yule, Chas. I.

PALMYRA.

Fowlie, William.
Norris, W. R.
Thorne, A. J.

PARDEEVILLE.

Emmett, Henry T.

PESHTIGO.

Murphy, Geo. M.
Ramsay, R. C.

PEWAUKEE.

Hayes, George.
Pauln, Emanuel M.

PHILLIPS.

Beck, J. M.
Swartz, David A.

PLAINFIELD.

Slater, W. C.

PLATTEVILLE.

Churchill, F. F.
Clarke, E. H.
Gentle, Thomas.
Paul, Milton J.
Sutherland, W. J.
Schuster, O. J.
Slothower, C. E.

PLYMOUTH.

Enright, J. J.
Iverson, B. A.
Kennedy, J. E.
Volk, Hubert T.

PORTAGE.

Clough, W. G.
Smith, Chester W.

PORT WASHINGTON.

Bachhuber, C. H.
Raeder, Leo.

PORT WING.

Hogan, J. F.

POYNETTE.

Kasten, A. W.

PRAIRIE DU CHIEN.

Gunderson, Nicholas.

PRAIRIE DU SAC.

Babington, R. S.

PRAY.

Hall, Pryce.
Princeton.
Kelley, Geo. V.

RACINE.

Blackhurst, E. W.
Collins, J. C. Ne.
Frye, Ernest L.
Hardaker, E. J.
Heek, Arthur.
Hibbard, D. O.
Hood, W. F.
Huxtabre, Arthur.
Irland, H. B.
Launord, Williard.
Mace, Henri F. M. D.
Martin, E. S.
Moyle, Olin R.
Nelson, Burton E.
Rees, T. S.
Riley, J. W.
Runge, F. W.
Sanders, Thos. E.
Schood, J. M.
Shephard, Chester C.
Shephard, D. A.
Smith, Martin L.
Sogard, John.
Stivers, S. A.
Storms, Wm. W.
Whitmore, A. A.
Wilbor, A. J.

RAMONA.

Hayt, Elmer.

RANDOM LAKE.

Majerns, Nicholas.
Wolf, Chas. P.

RANDOLPH.

Winden, Julius.

REEDSBURG.

Clifton, A. R.
Snyder, George F.

REEDSTOWN.

Moulton, C. L.

REEDSVILLE.

Krueger, Ernest.

REESEVILLE.

Weidman, F. C.

MEMBERSHIP LIST—MEN—Continued.

REWEY.

Jenks, A. P.

RHINELANDER.

Harrison, F. A.

RIB LAKE.

Drescher, F. E.

RICE LAKE.

Hale, John E.
Shussman, Leo. J.

RICHFIELD.

Laubenheimer, Edgar.
Laubenheimer, Harvey.
McConnack, John H.
Stuesser, J. C.

RICHLAND CENTER.

Doudna, Edgar G.
Duval, A. W.
Logue, J.B.
Thomson, A. A.

RIO.

Haugen, C. L.

RIPON.

Bridgham, John Merrill.
Erickson, Frank M.
Luther, E. L.
Moulton, Lewis H.

RIVER FALLS.

Ames, J. H.
Ames, J. W. T.
Karges, Rudolph.
Wilson, H. L.

ROME.

Lasher, J. H.

SAUK CITY.

Buckley, Michael T.

SCHLEISINGERVILLE.

Meilahn, W. O.

SEXTONVILLE.

White, F. E.

SHARON.

Richardson, B. D.

SHEBOYGAN.

Brasure, H. E.
Broer, Fred W.
Dexheimer, Gus A.
Evans, Leonard.
Hocke, Emil.
Holbrook, Chas. W.
Leidy, Paul E.
Leverenz, H. T.
Lowe, O. H.
Lutze, Chas. F.
McDaniels, Moses.
Palmer, John F.
Palmer, F. C.
Sperling, Hugo E.
Urban, Wm.
Vehweg, Ernest.
Walvoord, J. G.
Wittich, Walber J.
Winkler, Theo.

SHEBOYGAN FALLS.

Bowen, Emmett.
Hurley, R. V.
Kingsford, A. C.

SHAWANO.

Powers, J. F.
Roberts, Lorenzo D.

SILVER LAKE.

Kerwin, J. J.

SOLDIERS GROVE.

Adams, B. F.

SPARTA.

Davies, I. B.

SPRINGFIELD, ILL.

VanDorn, Chas.

SPRING GREEN.

Bray, F. M.

STEUBEN.

Burton, Geo.

STEVENS POINT.

Collins, Jos. V.
Culver, G. E.
Flagler, L. A.
Gardner, Wright A.
Hyer, F. S.
Lusk, W. F.
Patterson, Raymond G.
Sechrist, F. R.
Sims, John F.
Spindler, Frank N.

ST. FRANCIS.

Metzdorf, Rev. Wm.
Ryan, James F.

ST. PAUL, MINN.

Clow, W. B.

SOUTH KAUKAUNA.

Rupp, C. A.

SOUTH MILWAUKEE.

Carleton, Guy E.
Hein, Fred W.

STOCKBRIDGE.

Schraa, Nicholas, C.

STOUGHTON.

Banting, G. O.
Reseberg, W. J.
Stoat, Claude D.

STURGEON BAY.

Stangel, C. G.

SUN PRAIRIE.

Holt, F. O.

SUPERIOR.

Gilbert, E. M.
McCaskill, V. E.
Maddock, W. E.
Royce, A. M.
Schofield, H. A.

SUSSEX.

Klett, T. C.

THERESA.

Braemer, G. Andrew.

THIENSVILLE.

Plagemann, Fred J.
Schaefer, J. W.

TWO RIVERS.

Hamilton, W. J.
Klug, John A.

UNION GROVE.

Beath, John W.
March, Edw.
Zimmerman, G. J.

VIROQUA.

Chappell, E. H.
Colburn, W. P.
Hobart, C. E.
Overton, George.

WALDO.

Hughes, D. P.
Sullivan, Edward.

WATERFORD.

Bryant, Raymond.
McPherson, L. R.

MEMBERSHIP LIST—continued.

WATERLOO.

Waite, E. W.
Whipple, H. A.

WATERTOWN.

Kircher, Irving.
Martindill, J. W.
McCormick, B. E.
Roseman, W. P.
Struckert, John.
Wright, Leon.
Viebahn, C. F.

WAUKESHA.

Barrack, E. S.
Burchard, C. W.
Carrier, Wilbur O.
Howitt, John.
Hopkins, B. S.
Hutton, A. J.
Johnson, Randall.
Mulany, J. V.
Norris, J. E.
Phillips, Matt.
Ray, Prof. S. B.
Rhoads, G. B.
Smith, H. J.
Starr, H. L.
Weaver, E. W.

WAUNAKEE.

Tighe, B. B. C.

WAUPUN.

Curkeet, J.
McDonald, T. R.
Shibe, A. C.
Whitney, F. L.

WAUPACA.

Mitchell, William Roy.
Steenis, John W.

WAUSAU.

Bonell, J. A.
Cristhwait, G. A.
Hamrick, P. S.
Parlin, C. C.
Pelton, G. M.
Peterson, Alvin M.
Pivernetz, Wenzel.
Price, George C.
Reynolds, W. M.
Taylor, John.
Tobey, S. B.
Schooley,
Wells, O. E.

WAUTONRA.

Thompson, T.
Safoe, G. E.
Smith, W. E.

WAUWATOSA.

Beath, O. A.
Haukohl, Robert G.

WAUWATOSA.

Kolb, Philip A.
Smith, G. E.

WAUZEKA.

Henkel, Albert J.

WEST ALLIS.

Goff, J. Allen.
Jones, T. J.
Stringer, L. H.
Welbourne, H. E.

WEST BEND.

Bucklin, Frank W.
McLane, D. E.
Rudow, Henry W.
Wendelborn, Dan'l.

WEST DEPERE.

Berto, Thomas J.

WESTFIELD.

Wheelock, J. H.
Williams, M. C.

WEYAUWEGA.

Miles, E. H.

WHITEFISH BAY.

Sanders, John.

WHITEWATER.

Coon, Jay.
Hill, Chas. F.
Humphrey, H. C.
Kinsman, D. O.
Rittenburg, C. W.
Rounds, C. R.
Salisbury, Albert H.
Schroeder, H. H.
Sherrick, J. R.
Shutts, George C.
Upham, A. A.
Watson, W. T.

WILD ROSE.

Cummings, Real W.

WINNECONNE.

Anderson, N. A.

WITHEE.

Hamilton, A. E.

WONEWOC.

Brown, O. P.

WYOCENA.

Carlin, Geo.

WOMEN.

ADELL.

Donavan, Rose.
Lindow, Hulda M.
Reis, Etta.
Stratton, Carrie.

AFTON.

Palmer, Hazel.
Soper, Ethel.

ALBANY.

Broderick, Emma.
Flood, Julia.
Hewitt, Margaret.
Hillier, Lillian.
Litel, Hazel.
Raduege, Anna.
Wessel, Rosa.

ALGOMA.

Gilfillan, Dorothy.
Lohrey, Clara.
Schluessel, Elsie.
Thiard, Lucy.

ALMA.

Runkel, Lura.

ATHENS.

Barkow, Anna.

ARBOR VITAE.

Smith, Elsie.

ALMOND.

Abbott, Rose.
Barker, Kate.
Hetzel, Ruth,
Karnopp, Ella.
Karnopp, Ida.
Rice, Minnie.
Scott, Lillian.

AMBERG.

McLaughlin, Maude.
Mullaney, Florence.

AMHERST.

Rounds, Ethel.
Rowell, Elizabeth.
Riley, Sadie.

ANTIGO.

Clark, Kathryn.
Demerest, Pansy.
Dobbs, Iva.
Eising, Cora.
Hessel, Erma.
Kellogg, Myrtle.
Pressentin, Marie.
Rome, May.

APPLETON.

Anthes, Sadie.
Butler, Amelia.
Baker, Mary.
Bartlett, Effie J.
Buck, Blanche J.
Buck, Mayo B.
Chandler, Sadie.
Cuthbert, Catherine.
Farrell, Margaret.
Fuller, Henrietta.
Gardner, Hanna.
Gurnee, Inez.
Hocbaum, Lili.
Harrison, Sadie.
Harwood, Anne.
Howard, Ruth.
Jamieson, Mrs. Jennie A.
Jens, Matilda.
Kavanogh, Maude.
Keuper, Erna.
Lubben, Olive.
McCormick, Margaret.
Millern, Ida.
Morgan, Carrie E.
O'Keane, Josephine.
Owens, Elizabeth.
Owens, Nina.
Rodloff, Laura.
Roudebush, Harriet.
Rynders, Mrs. W.
Salisbury, Deaina.
Stausbury, Clara.
Saxton, Nellie.
Tracy, Kittie.
Van Patten, Lula.
Voge, Emma.
Voge, Theresa M.
Wolf, Ida.
Winslow, Katherine.

ARGYLE.

Colleintin, Miss.
Van Auken, Clarice.

ASHLAND.

Bartlett, Clements.
Berg, Marie.
Bishoff, Kittie.
Brown, Mabel.
Bullard, Nellie.
Bunn, Sophia.
Burnett, May.
Donelly, Alice.
Gibson, Florence.
Hanson, Mary.
Hiner, Ethel.
Hosener, Helen.
Johnson, Ida.
Kelley, Katherine.
Krimminger, Octavia.
Laud, Alice.
Lee, Mabel.
Linehan, Mattie.
MacLean, Ida.
Martin, Anne.
Mathews, Mary.
Murphy, Susan.
McMillan, Mary.
McIntyre, Charlotte.
Nichlos, Addie.
Sprague, W. M.
Stevens, Lillian.
Talbot, Minnie.
Vander Bie, Mary.
White, Ethel.
Williams, Nelle.

AUGUSTA.

Dahn, Louise M.
Ekern, Helga M.
Smith, Ethel E.

AVOCA.

Delaney, Mary.
Quinn, Therese.

BARABOO.

Bassett, Bevelyn.
Cone, Ruby.
Davies, Mattie.
Duncan, Mabel.
Enright, Frances C.
Falvey, Katherine.
Hackett, Fern.
Holah, Carolyn.
Hohn, Lillie.
Lamberton, Mildred.
Lewis, Leora.
McGann, May.
Metcalf, Alice.
Mothersill, Ruth.
Oates, Eulalie.
Ochsner, Emma.
Ode, Minnie.
Payne, Della.
Potter, Belle.
Sweet, Charlotte.
True, Eunice.
Turney, Margaret.
Tuttle, Grace.
Varnell, Edna.
Varnell, Evva.
Vorlop, Eda.
Willson, Martha.
Wright, Christian.

BEAVER DAM.

Blakeley, Addie.
Bulgar, Agnes.
Burr, Mae.
Fleming, Janet.
Hall, Marian.
Liston, Eugenia M.
Keller, Laura.
Kettelhon, Luella.
Maag, Elizabeth.
Maguire, Iren.
Manley, Virginia.
McCabe, Mary.
McGill, Mary.
Morgan, Nora.
North, Grace.
Palerson, Anna.
Patterson, Anna L.
Powers, Stella.
Prellnitz, Emma.

MEMBERSHIP LIST—WOMEN—continued.

Price, Grace.
Riggs, Sarah.
Scully, Elizabeth.
Spellman, Mary.
Welsh, Rose.

BELOIT.

Baumes, Helen.
Bill, Harriet.
Boyum, Nora.
Brandt, Antoinette.
Bradley, Mabel.
Carter, Floy.
Colbert, Roxana.
Collins, Ethel.
Cook, Flo.
Cravath, Mary.
Dennis, Ada.
Douglas, Mary E.
Douglas, Nellie J.
Duggan, Anna.
Frederick, Helen P.
Hill, Lydia.
Hollister, Aimee.
Holmes, Clara.
Holmes, Harriet C.
Horstmann, Laura.
Irman, Mabel E.
Jameson, Eva.
Johnson, Hilda.
Johnson, Runa.
Jones, Nellie.
Jones, Ruth.
Lee, Esther.
Loveland, Lena.
Macek, Blanche.
Marsh, Stella.
Metzner, Albertine.
Meigs, Elsie V.
Merriman, Clara.
Morrissy, Mame.
Morse, Mabel.
Nolty, Jessie.
Payne, Lillian.
Peacock, Carrie.
Peters, Alona.
Peterson, Nettie.
Pollock, Cora.
Quinlan, Elizabeth.
Randall, Charlotte.
Rayner, Mary.
Rodefeld, Louise.
Rosenberg, Miss.
Smith, Alice E.
Smith, Mayme.
Smith, Sadie.
Stone, Mrs. Hattie.
Strong, Mary.
Suydam, Bina.
Thompson, C. Allena.
Tuttle, Katherine.
Waite, Fanny M.
Wickhem, Margaret.

BELLEVILLE.

Handt, Carolyn Hazel.

BELMONT.

Beers, Clara.
Burns, Alice.
Patterson, P. P.

BERLIN.

Basing, Mollie I.
Burke, Clara.
Connally, Mabel.
Conway, Mayme A.
Dollar, Jennie.
Eldredge, Matie.
Fitz Maurice, Mary.
Ford, Mayme.
Godwin, Ethel I.
Heaney, Agnes.
Itzin, Lucy.
Melaas, Ruby.
McGill, Marie.
McKnight, Margaret.
Munroe, Maude M.
Neville, Clara B.
O'Connell, Mary.
O'Connor, Nona.
Seward, Bertha H.
Walter, Minnie.
Tice, Emma.

BLACK EARTH.

Barber, Gertrude M.
Gjelde, Hanna.
Goodlad, Mildred A.
Gulson, Thora.
Halsten, Nora.
Walton, Leta E.

BLOOMINGTON.

Peterson, Anna M.

BOSCOBEL.

Auschuetz, E. J.
Carey, Alice.
Dowling, Fanny.
Emery, Elizabeth.
Favor, Susie.
Gordon, Augie.
Hammond, Anna.
Hudson, Nellie G.
Kane, Kate V.
Kimball, Harr.
Maye, Bessie L.
McIver, Anna.
Terry, Maude L.
Weinfurther, Ella M.

BRANDON.

Kuehn, Adeline.
Hayes, Katherine.
Macumber, Marguerite.
Reeve, Mildred.
Schneider, A. M.
Weeks, Myrtle.

BRANCH.

Hessock, Marie.

BRILLION.

Finerty, Daisy I.
Lueker, Lydia.
McCabe, Anastasia.
Nabar, Della.

O'Laughlin, Mary.
Plank, Flora.
Sommers, Margaret.

BRISTOL.

Boyle, Florence.
Castle, Emma.
Tillotson, Emma.
Upson, Ella.

BROADHANNON.

Stafford, Margaret.

BROADHEAD.

Brace, Minnie.
Halfhead, Nellie E.
Karney, Jennie.
Lathrop, Elizabeth A.
Stair, Nellie.

BROOKFIELD.

Reimer, Mabel A.

BURNETT.

Cole, Winnifred.

BURNETT JUNC.

Mayhew, Corabelle.

BURLINGTON.

Anderson, May L.
Bankes, Ada.
Bankes, Grace.
Bunitt, Ella.
Buskman, Lillian.
Fiske, Lulu.
Hammond, Edith.
Jacobson, Louise M.
Jacobson, Nellie R.
Maloney, Nellie L.
Mathews, Delnia.
McEachron, Mina.
McEachron, Edith.
Mealey, Francis.
Mittlestadt, Edith.
Mittlestadt, Ottilia.
Richardson, Olive.
Robbins, Emma A.

BURLINGTON.

Rowntree, Imogene.
Stenhouse, Clara.

CALEDONIA.

Easton, Leora.
Easton, Gertrude.
Francke, Kate R.

CALHOUN.

Krueger, Edna.

MEMBERSHIP LIST—WOMEN—continued.

CAMBRIDGE.

Bilstad, Anna.
Bohan, Helen.
Gangstad, Ida.
Henderson, Bertina.
Moore, Anna.
Rumpf, Edna.
Slagg, Mae.
Stewart, Esther W.
Vernon, Jennie.

CAMBRIA.

Cross, Elva.
Davies, Katherine.
Hammond, M. Jeannette.
Hook, Lydia.
Humphrey, Olive.
Moss, Theda.

CEDARBURG.

Bartel, Ida.
Baum, Irma.
Boehme, Norma.
Butterfield, Jennie.
Christian, Elizabeth.
Halpin, Irene.
Hayden, Katherine P.
Kenney, Nora.
Patch, Rena.
Poole, Cornelia.
Reichl, Margaret.
Snyder, Sarah.
Sullivan, Nellie.
Sundemann, Matilda.
Volkmann, Hilda C.
Weaver, Mrs. Sarah.

CEDAR GROVE.

Clifford, Genevive.
Jodar, Hattie.
Potts, Anna.
Ramaker, Mabel.
Van de Wall, Hilda.

CHILTON.

Baldock, Viola.
Brauer, Lydia.
Camerford, Margaret.
Donhard, Ernesta.
Flatley, Irene.
Flatley, Lucy.
Glenn, Frances.
Lloyd, Aimee.
McGrath, Camille.
Mellon, Cecilia.
Roethke, Ella.
Schwalbe, Verone.
Thompson, Tilde T.

CHIPPEWA FALLS.

Lego, Olive.
Roth, Mayo.
Woolston, Edna.

CHICAGO, ILL.

Collins, V. V.
Pierce, Mary R.
Renneker, Alice.
Van Wie, Anna.

CLEVELAND.

Conway, Mary.
Dunbar, Evalyn.
Hoben, Miss.

CLINTONVILLE.

Liessman, Alma.
Walrath, Elizabeth.
Walrath, Gertrude.
Thatcher, Lucy B.

CLINTON.

Bounds, Florence.
Chambers, Carrie.
Dean, Jennie.
Eldridge, Ethel.
Paulson, Emma.
Stoney, Ruth.
Swingle, Carrie.
White, Della M.

COLUMBUS.

Choffee, Eleanor.
Clark, Clara L.
Colby, Alice.
Cook, Louise.
Erickson. Bessie.
Grady, Nellie.
Hamley, Maude.
Holtz, Mary.
King, Louise.
McGillivray, Ethel.
Mercer, Mary I.
Parke, Blanche.
Porter, Marcia.
Proctor, Clara.
Roegge, Pauline.
Sumnicht, Ena.
Thomas, Mary.
Williams, Kathryn.

COBB.

Allen, Bessie.
Schreiner, Huildar.

COLBY.

Philippi, Kathryn.
Slinde, Imelia.
Young, Rena.

CASCADE.

Crosby, Mae.

CAMPBELLSPORT.

Katen, Gertrude.

COLEMAN.

Lyneis, Idah.

CORLISS.

Lee, Amy.
Lee, Arpha W.
Tradewell, Erma.

CUBA CITY.

Russell, Cora.
Swint, Katherine.

CUDAHY.

Lambert, Una.
Ulmer, Elizabeth.

DARIEN.

Foote, Zella.
Garbutt, Hattie.
Holland, Margaret.
Palmer, Bessie.
Peterson, Agnes.

DEERFIELD.

Larson, Viola.
Robinson, Eva.
Sheets, Geneva.
Wahl, Ida O.

DE FOREST.

Bergh, Lona I.
Bergum, Bessie.
Crow, Josephine.
Lindas, Agnes.
Price, Beulah M.

DELAFIELD.

Hahn, Amy.
Sullivan, Ellen G.
Taylor, Kate E.

DELAVAN.

Church, Emeline.
Cook, Edna B.
Fonner, Mary D.
Fowler, Frances E.
Harley, Effie Rachael.
Helz, Marie.
Hobart, Almira I.
James, Mrs. Eliza.
Lowe, Nettie.
Nitt, Della.
Sampson, Mamie.
Sharp, Mrs. Helen.
Steinke, Elsie.
Sumner, Mary J.
Walker, Avis.
Tholen, Marie.
Topping, May.
Turner, Edna.

DE PERE.

Edgimton, Mary S.
French, Lulu.
Ingram, Irene.
Weber, Lynda

MEMBERSHIP LIST—WOMEN—continued.

DOUSMAN.

Clausen, Mabel.
Blood, Lorena.
Beales, Daisy.

DUNBAR.

Wilson, Orie.

DURAND.

Carlisle, Cynthia.

EAGLE.

Clemmons, Hattie.
Dolph, Ivy.
Hobernicht, Clara.
Morron, Laura.

EAST HAMPTON, N. Y.

Dayton, Mrs. E. H.

EAST TROY.

Brownlee, Mittie.
Haass, Lily K.
Healy, Hazel.
Lane, Katherine.
Miller, Olive.
Mulaney, Ruth.
Neff, Susie.
Schwartz, Allie.
Snaight, Mary.
Ward, Sarah.
Wendt, Elfie.
Zinn, Emma.

EAU CLAIRE.

Aman, Mary.
Cuddy, Anna L.
Janes, Victoria.
Janes, Blanche.
Leinenkugel, Theresa A.
McGentry, Maud.
Scriver, Mabel.
Smith, Jennie.

EDGERTON.

Bates, Roxie.
Bates, Wilma.
Bennett, Grace.
Billings, Lorene.
Cleland, Elizabeth.
Gardiner, Frances.
Goldsmith, Ada.
Hargraves, Norma.
Hayes, Ethelene.
Hebel, Della.
Hoen, Anna.
Jenson, Clara.
Kull, Helen.
Levedahl, Agnes.
Lintvedt, Etta.
McClaferty, Mildred.
McIntosh, Isabel.
Palmiter, Joe.
Pyre, Mae.
Roethe, Mrs. E. L.
Sewell, Emily.
Smith, Anna K.
Stone, Marion.
Striege, Esther.
Strouse, Ethel.
Volkman, Bertha.

EDGAR.

Bowe, Vigil.
Palmer, Ruth.

ELDORA, IOWA.

Brown, Mariam.

ELKHORN.

Anderson, Agnes.
Beckwith, Constance.
Beckwith, Mabel.
Cain, Mary.
Derthick, H.
Evans, Lillian.
Fare, Mabel Lau.
Francis, Sadie.
Holmes, May.
Knapp, Helen.
Liddell, Marjory.
Mahoney, Frances.
Maloney, Rose.
Martin, Helen.
Perring, Katheryn.
Rosenhauer, Mabel.
Steig, Josephine.
Walker, Louise.
Wilder, Loies.
Williams, Beth.

ELKHART.

Bennink, Lillian.
Dornbush, Emma L.
Eimermann, Elsa.
La Budde, Laura.
La Budde, Meta.
Leonard, Annette.
Menne, Marie.
Pfeil, Claudia.
Suchterhand, Hattie.

ELLENBORO.

Baker, Edna.

ELROY.

Sumsden, Mildred.
McMillen, Irene.

EMBARRASS.

Barkon, Clara H.

ENDEAVOR.

Goble, Louise.
Stieler, Florence E.
Steinman, Mildred I.

EVANSVILLE.

Cady, Grace.
Campbell, Adeline.
Edwards, Adeline.
Fairbanks, Cora.
Gillies, Elizabeth.
Greene, Myrtle.
Hatch, Caroline.
Hendricks, Nellie.
Luddington, Lila.
North, Hazel.
Noyes, Anna L.
Tullis, Mabel T.
Wallace, Marjorie.

EVERGREEN DRIVE.

Best, Margaret.

FAIRCHILD.

Jones, F. G.

FALL RIVER.

Fease, May.
Oliver, Amy.

FENNIMORE.

Ashmore, Ruby.
Bradbury, Grace.
Budd, Emily.
Cronin, Helen.
Gelvin, Nora.
Hinn, Bertha.
Howell, Daisy.
Rector, Minnie.
Rundell, Ada.
Stickney, Mary E.

FLORENCE.

Curtis, Anna M.
Kalmbach, Mabel.
Whaley, Luella.

FOND DU LAC.

Ablard, Ida D.
Acker, Ruby M.
Baker, Lucinda.
Bechaud, Laura A.
Blewett, Rose.
Briggs, Harriet.
Burroughs, Emma.
Burrows, Emma.
Butterfield, Gladys.
Chegivin, Rose.
Connell, Sarah.
Connole, Nan.
Cood, Jennie.
Cooper, Bessie.
Crowley, Mayte.
Crowe, Bridget.
Costello, Mary.
De Sombre, Minnie K.
Dittmar, Anna.
Dolan, Clara.
Donnelly, Elizabeth.
Doyle, Genevieve.
Elmer, Edna.
England, Dorothy.
Erhart, O'Letta.
Evans, Katherine.
Fahey, Sara L.
Flanagan, Lulu.
Fox, Dora R.
Galloway, Emma.
Geve, Elsie.
Geve, Tillie.

MEMBERSHIP LIST—WOMEN—continued.

Giddings, Clara.
Givens, Helen B.
Gleeson, Mary.
Grandt, Julia.
Harlin, Agnes.
Havens, Elizabeth.
Heath, Belle Porter.
Hein, Elsie.
Heiny, Elizabeth B.
Hinz, Helen Z.
Holmberg, Maye E.
Hughes, Avis.
Jackson, Fern.
Jarvis, Goldie.
Jenkyns, Daisy.
Joyce, Claire Olive.
Kyle, Eva.
Licht, Margaret.
Liston, Clara.
Loft, Geneivara.
Loth, Florence.
Manion, Minnie E.
Manning, Mabel.
Martin, Daisy M.
Mason, Harriet.
Matteson, Claire.
McCormick, Grace E.
McCoy, Mollie.
McCrory, Minnie J.
McMonagle, Kathryn.
Medberry, Bernice.
Murphy, Ruth.
Murry, Mary K.
McLean, Teresa.
Nugent, Elizabeth.
O'Brien, Anne.
Olmstead, Nellie E.
Palmer, Grace.
Peebles, Edna.
Perkins, Minnie G.
Post, Beulah.
Ripley, Emma.
Robson, Mary F.
Ryan, Sara.
Saak, Bertha A.
Schoenlaub, Helen G.
Searles, Ida.
Stanton, Mary.
Stanton, Rose.
Sweeney, Harriet.
Sullivan, Agnes E.
Tallmadge, Josephine.
Titus, Gertrude M.
Ward, Vara.
Waters, Elizabeth.
Whalen, Vernal.
Whinfield, Carra.
Wilson, Phoebe C.
Wood, Emma H.

FONTANA.

Dunn, Irene.
Moran, May.
Valentine, Florence.

FOOTVILLE.

Evans, Mary A.

FORT ATKINSON.

Bain, Winifred.
Brown, Gertrude.
Coppins, Mary J.
Coutremarsh, Clara.
Doyle, Hazel.
Erb, Louise.
Foote, Genevieve.
Gilbertson, Mildred.
Goddard, Carrie.
Hagemann, Mrs. J. A.
Hevey, Elizabeth.
Krippner, Pearl.
Lackersteen, Mary.
Lackersteen, Wynne.
Main, Florence.
Marr, Jessie.
Mathews, Wanda.
McIntyre, Sarah.
McMillen, Edith.
Peck, Mary H.
Pfeiffer, Blanch.
Potter, Clara.
Sleeter, Verna.
Spry, Mary E.
Stagg, Neva.
Tracy, Ida E.
Webb, Mrs. Adelia.
Webber, Mary.

FOX LAKE.

Church, M. G.
Gamble, Effie.
Kohl, Christabel.
Rhoades, Ellen M.
Smith, Anna.
Wallis, Minnie.

FRANKVILLE.

French, Dorothy.
Fritchen, Ada.
Non, Phoebe.

FREDONIA.

Hausman, Minnie.
Pallausch, Laura.

GRAND RAPIDS.

Jackson, Mrs. M. H.

GREEN BAY.

Allin, Etta M.
Anderson, Cecilia.
Armstrong, Maggie V.
Arndt, Anna F.
Barke, Josephine.
Bent, Jane.
Black, Agnes A.
Black, Mary.
Brauns, Lydia.
Brown, Evelyn.
Byram, Katherine E.
Clowry, Elizabeth.
Cody, Mary K.
Copp, Tracy.
Cusick, Ella.
Doyle, Nelly E.
Dunlap, Daisy H.
Dunn, Jennie.
Edwards, Edith C.
Egan, Mary A.
Farrell, Kittie G.
Farrell, Mary.
Flatley, M. Stella.
Flatley, Anna.
Fleming, Ella.
Gaylord, Katherine.
Gibbons, Gertrude.
Graves, Maud.
Grignon, Kittie.
Grignon, Rachael M.
Gunn, Eleanor M.
Hansen, Marie C.
Hansen, May C.
Heidgen, Clara.
Hogan, Jennie.
Hogan, Kathryn.
Hogan, Margaret L.
Hogan, Nora F.
Hollmann, Lydia A.
Jacobi, Carrie B.
Jacobi, Erna.
Johnson, May I.
Kelleher, Margaret.
Kelleher, Minnie H.
Keogh, Elizabeth.
LeClair, Rose.
Lefebore, Alice R.
Lehan, Catherine.
Lewis, Eva.
Libert, Addie.
Lomas, Cora.
Luckenbach, Josephine.
Mack, Margaret A.
Mahoney, Anna.
Martin, Mrs. E. B.
McCormick, May L.
Nichol, Jessie E.
Nitzel, Wilma A.
Olson, Anna E.
O'Neill, Margaret M.
Pamperin, Emily I.
Parizak, Josephine.
Platten, Mary K.
Platten, Maud.
Rathman, Emma.
Rice, Nora.
Rohan, Ella.
Ruel, Nellie M.
Schuette, Amanda H.
Seibel, Elizabeth.
Senn, Florence.
Smith, Essie.
Smith, Gertrude.
Sogey, Laura A.
Steinfeldt, Emma E.
Vermeyer, Amanda.
Vermeyer, Emma.
Wilson, Florence.
Windhauser, Clara.
Zeebrigg, Mae.
Zimmer, Anna M.

LAKE GENEVA.

McGuire, Louise.

GAYS MILLS.

Hammond, Ellen.

GENOA JUNCT.

Brown, Evelyn.

GERMANIA.

Phillips, Vera.
Cook, Maud.

MEMBERSHIP LIST—WOMEN—continued.

GLENBEULAH.

Barber, M.
Herrling, Lilly V.
Hoskins, Elizabeth A.
Sinz, Amelia F.
Vanderhoot, Letta.

GRAFTON.

Gerlack, Minnie.
O'Leary, Martha E.
Schnabel, Adele.

GENESEE.

Olson, Viola.
Schafer, Minnie.

GORDON.

Biggs, Ella.
Biggs, Pearl.

GRANVILLE.

Foote, Nellie.

GRAND RAPIDS.

Derham, Catharine.
Emery, Rita.
Moll, Dorothea A.

GRATIOT.

Clark, Alice.
McAuliffe, Agnes.
McKernan, Belle.

GREENBUSH.

Evans, Martha.
Saecker, Emma.

GRIMMS.

Doolan, Catharine.
Hayden, Etta.
Halloran, Verona.

HALE'S CORNERS.

Cowley, E. E.
Lynch, Mary.
Malia, Frances.
Schlitz, Louise.
Wilkinson, Kathrine.

HARTLAND.

Farnham, Della.
Felker, Carolyn.
Henderson, Christine.
Marsh, Leola.
Palen, Nellie.
Van Buren, S. B.

HARTFORD.

Brockhaus, Clara.
Clancy, Agnes.
Durick, Laura.
Falkenstern, Ella.
Foote, Harriet.
Frey, Elizabeth.
Green, Alice.
Hoegh, Nanna.
Johannes, Anna.
Kelly, Mary.
Lepeen, Elsie.
Manning, Elizabeth.
Mills, Jean.
Morgan, Minnie.
Myers, Helen.
Portz, Melvina.
Ramsey, Florence.
Reuter, Hilda.
Townsend, Elizabeth.
Troxell, Grace.
Waldie, Jessie.

HELENVILLE.

Watther, Alice.

HIGHLAND.

Ford, Myra.
Frye, Margaret.
Kennedy, Frances M.
Maning, Theresa.
Parish, Clara.
Riley, Mary.

HILLSBORO

Baley, Eva.
Stark, L. S.

HIXTON.

Colburn, May.

HONEY CREEK.

Kelly, Anna.
Vaughn, Rae.

HORICON.

Cody, Rachel.
Douglas, Blanche.
Eyland, Margarette.
Freeman, Allie.
Freeman, Katherine.
Herger, Alice.
Huppert, Thora E.
Neill, Lillian.
Quick, Lizzie.
Rehfeld, Minnie E.
Shonts, Leola.

HORTONVILLE.

Baer, Edna.
Lohrenz, Lottie.
Mayberry, Marie.

HUSTISFORD.

Beisner, Maude.

IOLA.

Erickson, Ada T.

IRON RIVER.

Eggleston, Sadie L.

IRON RIDGE.

Kekouskee, Elizabeth.

Spahr, Adella.

IXONIA.

Thamka, Selma.

JACKSON.

Karsten, Minnie A.
Koelle, Alma.

JANESVILLE.

Akin, Lucy.
Armstrong, Mary.
Atwood, Abbie.
Baker, Teresa.
Bohan, Clara.
Bowen, Edith.
Bowles, Mellie.
Buckmaster, Agnes.
Buckmaster, Mary.
Casford, Lenore.
Cavey, Alice.
Clark, E. May.
Clemons, Cora.
Cody, Janet.
Colman, Laura.
Crowley, Catherine.
Cunningham, Phoebe.
Curtess, Mary.
Doheny, Mary.
Dutton, Julia.
Enright, Rosemary.
Fardy, Nellie.
Fifield, Winifred.
Fuller, Anna.
Gagen, Rose.
Grant, Dorothy.
Harris, Elizabeth.
Hayes, May.
Hemingway, Edna M.
Henderson, May.
Hiekey, Sarah.
Hill, Luella.
Howarth, Maud.
Howarth, Luella.
Hyde, Mrs. Georgia C.
Jacobs, Mary.
Johnson, Grace.
Jolley, Helen.
Jones, Wilna.
Joyce, Margaret.
Joyce, Minnie.
Klinger, Augusta.
Lillis, Elizabeth.
Loudon, Jessie.
Meullenschlader, Helen.
McGregor, Alice K.
Morris, Nellie.
Monat, Grace.
Murray, Elizabeth.
Nelson, Kate.
Paterson, Elizabeth.
Paterson, Jennie.
Paterson, Margaret.
Roberts, Mrs. H. L.

MEMBERSHIP LIST—WOMEN—continued.

Sayles, Bertha.
Schroeder, Eva.
Whearer, Louise.
Smith, Ida.
Spear, Cora.
Spoon, Grace.
Turner, Edith.
Turner, M. Ada.
Welch, Helen.
Whitmore, Emma.
Whitmore, Lucy.
Willey, Hazel.
Woodruff, Margaret.
Youngclause, Margaret.
Zeinniger, Caroline.
Zeinniger, Gertrude.

JEFFERSON.

Fernholz, Emma.
Hake, Florence.
Lewis, Sara E.
Olson, Mary L.
Skelton, K.

JOHNSON CREEK.

Anderson, Emma.
Dickenson, Maude V.
Emmert, Alice.
Hackett, Catherine.
Webb, Mrs. M.

JUDA.

Gapen, Mildred.

JUNEAU.

Brown, Margaret.
Coville, Jennie.
Dolan, Tessie.
Kekowskee, Grace.
Lewis, Lillian.
Owens, Lylia.
Pluckhan, Edith.
Rudolf, Clara.
Schwantz, Alexa.
Sumnicht, Flora E.

KALADONIA.

Pittelkow, Elsie.

KANSASVILLE.

Brainerd, Verna.
Howkins, Della.
Nolan, Margaret.
Payne, Myra.

KAUKAUNA.

Bell, Charlotte.
Eiting, Anna.
Eiting, Lorna.
Guyles, Calla.
Hougen, Evelyn.
McCabe, Rose.
Nolte, Josephine.
Phillips, Clara.
Saxton, Ellen.
Searborough, C.
Siefert, Maurine.
Williams, Mary.

KENOSHA.

Albee, Mildred.
Austin, Mattie.
Baley, Isabel.
Bennet, Ethel.
Bufton, Eda.
Burris, Dorlos.
Butcher, Anna.
Cable, Belle G.
Carter, Clara M.
Carter, Winnefred.
Dennis, Georgiana.
Eddy, Mayme M.
Farley, Winifred.
Fillin, Elizabeth.
Gebhart, Helen.
Graves, Cora E.
Hahn, Laura E.
Hanaman, Mrs. W. W.
Havens, Leola M.
Hoehn, Hermena A.
Hood, Edna E.
Jacob, Elizabeth.
Jorgenson, Dugmar.
Kaltenbach, Frances G.
Keating, Marie.
Kelly, Alice.
Kelsey, Lella B.
Kroncke, Anna M.
Lampe, Lulu C.
Lamke, Mabel F.
Laugan, Mary E.
Larsen, Minnie.
Lilley, Irene C.
Lingonblad, Joanna.
March, N. Alice.
March, Ida M.
Martin, Mae E.
McHugh, Anna.
McKenzie, Mrs. Hattie M.
McNamara, May E.
Mitchell, Agnes A.
Mitchell, Nellie.
Moran, Ella G.
Murdock, Edith M.
Northrup, Eleanor E.
O'Hara, Jennie M.
O'Hara, Agnes L.
Pirsch, Margaret.
Pirsch, Margaret.
Riley, Bessie.
Riley, Lotta.
Robinson, Martha.
Royce, Cornelia B.
Searles, Maude.
Shanley, Rosella I.
Shields, Flora.
Spartz, Mary G.
Stock, Alma.
Sutton, Lulu B.
Telfer, Margaret.
Tobin, Minnie O.
Toner, Marjorie.
Truax, Clara F.
Wallis, Edith G.
Washburn, Edna B.
Weston, Nuna E.
Williams, Mrs.
Yoemans, Frances A.
Yule, La Maude.

KEWASKUM.

Asman, Gretchen.
Clark, Agnes.
Guth, Lormda.
Haug, Olga.
Henry, Alice.
Kocher, Elise.
Schield, Anna.
Schlosser, Lillian.
Schoofs, Kathryn.
Schoofs, Susan.

KEWAUNEE.

Devitt, Alda L.
Schaff, Emily.

KIEL.

Erickson, Verna.
Kieselhorst, Elsa.
Loftus, Ione.
Loftus, May.
Stielow, Elsie.
Wilson, Ruth.

KILBOURN.

Douglas, Celia.
Jones, Vera.
Scott, Mabel.
Wehausen, Edna.

KNOWLES.

Kerble, Irma.

LA CROSSE.

Hitchcock, Clara D.
Rollins, Martha.

LADYSMITH.

Davis, Florence.

LANNON.

Cawley, Ellen.
Millan, Anna.
Walsh, Margaret.

LANCASTER.

Howell, Nellie.
Young, Lilley.

LAKE BUELAH.

Herrling, Alma.
Murphy, Rose.

LAKE GENEVA.

Baker, Marietta S.
Bingham, Maud.
Bowie, Ella.
Gibbons, Martha.

MEMBERSHIP LIST—WOMEN—continued.

Hickey, Winifred.
Hill, Florence E.
Hitchcock, Edna.
Lusignan, Anna.
Lusk, Lena.
Marshall, Anna.
Metcalf, Margaret F.
Metcalf, Sarah.
McDonough, Sarah.
Nethercut, Mary.
Seymour, Helen.
Sheldon, Mrs.
Stewart, Anna.
Short, Edith.
Upham, Ethel Tenney.
Whitney, Beatrice.
Whitney, Lura.
Watson, Lizzie.

LAKE MILLS.

Bowles, Anna.
Dahlem, Jessie F.
Hayden, Grace M.
Helland, Marian.
Hoyt, Grace L.
Fleming, Florence.
Fleming, Vera.
Fitts, Minona.
Foote, Bessie.
Foote, Helen.
Oehler, Bernice.
Oviatt, Ruth.
Richardson, Elizabeth.
Savary, Pearl.
Stegeman, Louise.
Veldman, Eugenia.
Veldman, Florence.

LITTLE BLACK.

Neeck, Minnie.

LIVINGSTON.

Andrew, Frances.

LODI.

Black, Lorriane.
Bunker, Maude E.
Kayser, Stella.
Mulock, Maude.
Peterson, Hallie.
Winterfield, Endrea.

LOMIRA.

Goetsch, Edith.
Zeidler, Freda.

LONDON.

Johnson, May.
Leland, Mabel.

LOWELL.

Reinhard, Leona.
Reinhard, Etta.

LONE ROCK.

Keyser, Lilah.

LYONS.

Ayers, Edna.

MADISON.

Ames, Sadie.
Baker, Beulah.
Bandli. Christine.
Bascom, Lelia.
Bissell, E. C.
Blazer, Rosetta.
Bohlmann, Alma.
Bowers, Della.
Brabant, Josephine.
Brinkhoff, Abbie.
Burdick, Mary L.
Byrne, Ella F.
Cary, Mrs. C. P.
Chamberlain, Mrs. Anna B.
Collins, Maude.
Collins, Margie.
Cosgrove, Theresa.
Cravath, Ida M.
Culligan, Nora R.
Cummings, Margaret E.
Curtis, Mildred.
Dengler, Clare.
Dobson, Dr. J. H.
Edgar, Mary L.
Farris, Christina.
Feeney, Kate H.
Fitch, Helen.
Flatley, Matilda.
Harper, Caroline.
Hatch, Eva.
Hatz, Rose.
Heiliger, Ella.
Herfurth, Elizabeth M.
Hessman, Lena.
Hopkins, Leona.
Hopson, Amy.
Howard, Eva.
Hoyer, Elnora.
Huber, Dora.
Huff, Mary S.
Hyland, Emma C.
Jenkins, S. D.
Jones, Renette.
Keogh, Norah.
Kleinpell, Irma.
Klein, Edith A.
Latham, Gladys.
Lernard, Clara B.
Lyman, Florence A.
Lyons, Maybelle.
Maher, Mary.
Mann, Ella C.
Marlatt, Abby L.
Marty, Etta.
Marvin, Adeline R.
Maxham, Julia.
Mayhew, Abba S.
McArthur, Mary.
McClernan, Marie.
McConnell, Emily.
McCormick, Elizabeth R.
McGovern, Mary.
McGregor, Elizabeth.
McKee, Nora L.
Merrill, Judith.
Mihleiss, Alice.
Morgan, Cora.
Moseley, Flora C.
Moseley, Anna B.
Murphy, Julia E.
Nelson, Lillian M.
Olson, Edith M.
Olson, Thelma.
Parsons, Emily R.
Pietzsch, Harriet.
Pratt, Velmer D.
Preuss, B. H.
Quirk, Mrs. Emily.
Ray, Mrs. Ruby.
Redal, Marie.
Regan, Katherine.
Reichert, C. Lorena.
Riley, Katherine.
Riley, Martha.
Sawyer, Elsa.
Schulte, Frances.
Sell, Martha E.
Shermerhorn, Emma.
Shearer, Elga M.
Shephard, Pauline.
Shimmins, Etta.
Skidmore, Vashti L.
Sloan, Elizabeth A.
Smith, Matilda.
Steve, Mrs. F.
Stevens, Janette.
Stromme, La Gertha.
Tait, M. Bertha.
Tormey, Julia F.
Tullis, Miss.
Udell, Myra.
Udell, Nona.
Van Nostrand, Clemana.
Vick, Irene.
Warning, Winnie C.
Whitney, Florence.
Whitney, Clara.
Whitney, Maude H.
Williams, Margaret.
Wirth, Eva M.
Wiswell, Zilla.
Young, Caroline M.
Zilisch, I. A.
Zimmerman, Louise.

MANITOWOC.

Brady, May.
Binford, Maude.
Bishop, Vivian.
Bowron, Myrtle.
Byrne, Ruth.
Chapman, Mayme.
Cheney, Rosa M.
Day, Grace.
Edwards, Dorothy.
Ekern, Ruth N.
Fechter, Mrs. Pauline.
Healy, Nora.
Henson, Ethel.
Hildebrand, Ruby.
Holzer, Mae L.
Jones, Olive H.
Johnson, Margaret.
Krumurey, Hildegarde.
La Perriere, Nellie M.
Laughlin, Blanche.
Lucas, May.
Matek, Julia.
Miller, Emma.
Miller, Lesta.

MEMBERSHIP LIST—WOMEN—continued.

Murphy, Cora.
Nespor, Julia.
Nims, Mrs. R. A.
Olson, Kjisten.
Paine, Gertrude E.
Robinson, Mary.
Rosenstengel, Helen.
Sadlier, Nellie.
Saloman, Clara.
Schneider, Dorothy.
Schreihart, Viola.
Schumacher, Caroline.
Stauss, Rose.
Strong, Anna L.
Thuerer, Jessie.

MANAWA.

Hanna, Mary.
Kuester, Nellie A.
Roberts, Margaret K.
Schauder, Sedonia.

MARATHON CITY.

Edwards, Erna.
Krause, Ida.
Schneiders, Leona.

MARINETTE.

Anderson, Anna H.
Campbell, Martha.
Chandler, Grace.
Clark, Mildred.
Dafter, Mrs. Emma.
Daniels, Anetta.
Daniels, Helen.
Damville, Ida.
Dennett, Florence.
Gagnon, Lynne.
Golden, Elizabeth.
Golden, Jennie.
Goodnough, Ora.
Greene, Mrs. Chas. T.
Hamilton, Bessie.
Harmar, Edna.
Helgeson, Lillian M.
Hemlock, May.
Hubley, Bernice.
Hughes, Mary.
Ingram, Flora.
Johnson, Ella.
King, Elizabeth M.
Kuhns, Hattie.
Landgraf, Mrs. G. H.
Leonardson, Charlotte.
Le Roy, Emma.
Maxwell, Mrs. M. H.
Mac Arthur, Nancy.
McComb, Mildred.
Morse, Pearl.
Motley, May.
Orcutt, Allie J.
Porterfield, Jean.
Porth, Irma.
Powers, Katherine.
Reed, Katherine.
Savage, Carmen.
Steele, Stella.
Stevenson, Vernette.
Swanson, Ida.
Taylor, Sadie.
Thompson, Minnie.
Thull, Margaret.
Verway, Grace.
White, Vina.
Wilke, Ada D.
Zerull, Clare.

MARION.

Mortenson, Mrs. M.
Soules, Mollie.

MARKESAN.

Doering, Marilla.
Flanders, Nettie.
Haviland, Dora.
Ingalls, Vera.
Knilans, Florence.
McCulloch, Sadie.
Welch, Nellie.

MARSHALL.

Burton, Fannie.
Fullest, Alma.
Hart, Eda.
Koenig, Selma.
Wills, Sara E.

MARSHFIELD.

Dunn, May.
Latta, Maud.
Wood, Viola.

MAUSTON.

McMillan, Mattie.

MAZOMANIE.

Laws, Genie R.
O'Connor, Marie.
O'Hara, Alma.
Stucke, Anna O.

McFARLAND.

Blakeman, Maud.

MEDFORD.

Schweppe, Maurlan I.
Hamm, Lydia C.

MELLEN.

Cashman, Nellie.
Ferguson, Alice.
Hirscher, Sadie.
Longarre, Anna S.
Mathews, Eileen.
McNeill, Mildred.
Murrish, Ethel M.
Pease, Grace.
Rohrdanz, Clara.
Spink, Ida F.

MENASHA.

Boyce, Cecelia.
Brunstad, Hanna.
Bryant, Carolyn.
Bush, Lydian U.
Casperson, Elida.
Chapleau, Ella.
Christoffersen, Clara.
Daniells, Ida.
Easterbrook, Mabel.
Gallagher, Delia.
Grandine, Amy.
Kennedy, Hattie.
Lloyd, Anna P.
Mericle, Maud.
O'Connor, Clara.
Powers, Ellen J.
Remmel, Alicia.
Richardson, Mrs. A. V.
Rosenow, Agatha.
Salter, Jennie.
Sawtelle, Mabelle.
Whipple, Mary P.

MENOMONIE, WIS.

Allen, Elizabeth.
Allen, Daisy May.
Bogstad, Inga.
Bovee, Zaidee.
Brackett, Jennie M.
Burgett, Kate.
Burnham, Madge E.
Conley, Emma.
Cramer, Susie.
Cuff, Emma.
Fitzgerald, Nellie.
Hegland, Emma K.
Jungck, Emma.
Lyon, Mary.
Mackay, Elizabeth.
Mather, Mrs. F.
Meyers, Marion.
Moore, Ethel E.
Murley, Nora.
Salter, Hazel.
Smith, Maud E.
Spohr, Wilhelmina.
Swenson, Caroline.
Wood, Florence S.

MENOMONEE FALLS.

Adams, Harriet.
Gill, Nellie.
Handford, Olive.
Hoyt, Grace.
Rolf, Ruth.
Trinwith, Alice.
Wilke, Ruth.

MENOMONEE, MICH.

Baker, Flossie.
Radford, Frances.

MERRILL.

Bucholtz, Louise.
Ravn, Agnes.
Rockafellow, Julia.
Stoddard, Elizabeth.
Sutton, Margaret.

MEMBERSHIP LIST—WOMEN—continued.

MERTON.

Ainsworth, R.
Bertheson, Ethel.
Roesch, Anna.

MIDDLETON.

Astell, Mollie.
Haberland, Alma.
Thompson, Lettitia.

MILTON.

Bemis, Sarah.
Clark, A. Cora.
Cole, Kittie M.
Crandall, Mrs. O. E.
Dunn, Eleanor E.
Kelley, Cornelia.
Macomber, Winifred.
McBride, Katherine.
McBride, Mary.
Millar, Alice.
Mullen, Margaret.
Roach, Mary.
Rowe, Mae.
Rowe, Maud.
Smith, May.

MILTON JUNCTION.

Fox, Florence.
Godfray, Redella.
Hollis, Etta.
Swaney, Hazelle.
Sykes, Dora L.
West, Amia M.

MILWAUKEE.

Acker, Eva.
Ackerman, Vera M.
Adamson, Nellie.
Addington, Daisy.
Adele, Sister.
Albert, Margaret.
Agnes, Sister.
Albrecht, Elsa.
Aldrich, Mildred.
Allen, Amy.
Allen, Grace.
Althoff, Pauline.
Ahrens, Emma C.
Amazeen, Sarah H.
Anchester, Etta.
Anderson, Julia.
Anderson, Lilian.
Anderson, Madge.
Andrew, Ethel H.
Angle, Rilla.
Antonirus, Sister M.
Armstrong, Edith.
Armstrong, Gertrude.
Armstrong, Nancy.
Austin, Edna W.
Ayrs, Lois V.
Baas, Elizabeth.
Baas, Mayme E.
Bach, Marie.
Baden, Sara M.
Baldwin, Jessie.
Bandow, Florence.
Banks, Nellie G.
Barber, Eva G.
Barber, Laura.
Barnson, Mabel.
Barr, Belle M.
Barsness, Amanda.
Bartlett, Eliza.
Baude, Wally.
Bauer, Emily C.
Bantz, Emma C.
Braband, Lila.
Beardsley, Gertrude M.
Beck, Minnie.
Becker, Clara.
Becker, Rachel.
Beetham, Bernice.
Belcher, A. E.
Bell, M. C.
Bendixen, Eva.
Bennett, Willett.
Bensel, Martha.
Bergmann, Emma M.
Bergschmidt, Clara L.
Bernard, Elizabeth.
Bernges, Eleanor.
Bernhard, Henrietta.
Bersh, Anna.
Best, Augusta.
Best, Hattie.
Beyer, Hannie.
Bibinger, Elma.
Bickler, Sophia.
Bird, Alice.
Bird, Elizabeth.
Bird, Salena.
Biron, Susanna.
Bishop, Adelaide.
Bishop, Dollie.
Bitner, Lora.
Bisby, Florence A.
Blakeley, Harriet.
Blanchar, Ora A.
Bleyer, Isora E.
Blodgett, Sarah.
Blood, Frances A.
Bluett, Carrie.
Blumenthal, Lulie.
Blyer, Mary L.
Bodden, Irma.
Boden, Sadie.
Bolton, Sarah E. B.
Bond, Ruth G.
Booth, Mary.
Booth, Phoebe.
Bonfoey, Jennie.
Boyce, Carrie L.
Boyce, Leola I.
Boyd, Jessie.
Boyle, Gertrude A.
Boyle, Laura C.
Braband, Emma.
Braman, Cora.
Braman, Vinnie.
Brand, Margaret.
Brandt, Agnes M.
Brandt, Louise.
Braun, Clara.
Bray, Ellen V.
Frazier, Helen L.
Brekow, Anna.
Brennan, Kate.
Brett, Margaret.
Brigden, Aurora.
Brigden, Myrtle.
Briggs, Ada I.
Briggs, Elizabeth.
Brigham, May.
Broche, Elsie.
Bronson, Alice M.
Brookins, Florence.
Brookins, Medora C.
Brooks, Mabell F.
Brown, Ella J.
Brown, Helen M.
Brown, S. Edith.
Brownell, Stella F.
Brugger, Frances A.
Brunckhorst, Esther F.
Brunckhorst, Lucy.
Brunckhorst, Wilhelmine.
Brunson, Allie.
Buckley, Bessie.
Buckley, Kate E.
Buckley, M. J.
Buetow, Wanda.
Bulfin, Gertrude A.
Bullock, Agnes.
Bullock, Gertrude.
Bunker, Norna E.
Bunsen, Sophia.
Burch, Ethel T.
Burke, Elizabeth A.
Burke, Martha.
Bernardeen, Sister.
Burnett, Winnie.
Burrington, Stella.
Busack, Anna A.
Buschwon, Leta M.
Buss, Flora E.
Buss, Mabel.
Buss, Nora.
Bussewitz, Beatrice.
Byington, Josephine.
Calkins, Mary I.
Callaway, Bessie.
Callaway, Olive.
Calmerton, Evalyn.
Calmerton, Sadie G.
Calverley, Frances F.
Campbell, Julia.
Cannon, Harriet.
Canty, Margaret.
Carpenter, Inez.
Carrigan, Teresa.
Carroll, Lillian C.
Carroll, Margaret.
Carroll, Mary.
Carroll, Sarah J.
Case, Gertrude T.
Case, Lucy.
Case, Matilda.
Casper, Agnes.
Cassoday, Ella F.
Cather, Harriet M.
Chandler, Ada.
Chatfield, Isabel.
Child, Alice M.
Childs, Lillian F.
Cholvin, Inez.
Christensen, Olive L.
Churchill, Mary.
Clark, Frances E.
Clark, Ida Hood.
Clark, Mrs. J. M.
Clarke, S. Belle.
Clarke, A. Blanche.
Clarke, Flora A.
Clarke, Ida A.
Clarke, Loretta.
Clarke, Rose A.

MEMBERSHIP LIST—WOMEN—continued.

Clay, Leora.
Clementine, Sister M.
Clinton, Emma.
Colbert, Cecelia.
Coleman, Jennie.
Collins, Mae E.
Collins, Vera.
Colquitt, Elsie M.
Comeaw, Mary.
Commentz, Augusta.
Comstock, Mabel.
Conant, Gertrude.
Connell, Alice.
Connelly, Nellie M.
Conrad, Clara.
Conroy, Agnes.
Consuela, Sister M.
Conway, Anna M.
Cook, May L.
Cook, Rose A.
Cooke, May K.
Cropper, Lulu.
Cornelius, Winifred.
Corrigan, Margaret.
Costello, Anna A.
Costello, Margaret.
Couse, Nellie G.
Cowles, Emma M.
Crooks, Nellie.
Crystal, Ella E.
Culligan, Stasia.
Cummins, Julia A.
Cullen, Sara.
Cullen, Violet.
Culver, Lillie.
Cundall, Jessie L.
Cunningham, Agnes.
Curtin, Mary M.
Curtis, A. B.
Dalgleish, Catherine I.
Dalgleish, Helen J.
Dallwig, Olga.
Dapprich, Emma.
Davey, Minnie.
Davidson, Bessie.
Davidson, Elsie.
Davidson, Rhoda.
Davies, Lucy.
Davies, Mrs. M.
Davies, Marie L.
Davis, Mary.
Dawe, Ella M.
Dawson, Grace.
Dean, Meda E.
Dempsey, Fannie E.
Dempsey, Florence.
Dempsey, Janette.
Dempsey, Mary J.
Denker, Hulda.
De Sales, Sister M.
Desebrock, Irma.
Desmond, Mary J.
Desmond, Theresa.
De Werth, Della.
De Werth, Emma.
Dick, Margaret A.
Dick, Susie G.
Dickey, Florence.
Didier, Lillian.
Diebold, Caroline.
Diener, Antoinette.
Dierschke, Miss.
Dignan, Annie.
Dignan, Kate.
Dillon, Lillie M.
Dix, Helen.
Dixon, Agnes M.
Dobson, Mary J.
Dodge, Genevieve.
Doerfler, Anna.
Doherty, Anna.
Dolan, Catherine.
Dolan, Frances.
Donnelly, Elizabeth.
Donnelly, E. Jennette.
Donnelly, Margaret.
Donnelly, Mary U.
Donnelly, Theo.
Donohue, Agnes L.
Donoran, Anna.
Doolan, Sadie.
Doreston, Leona.
Dorman, Florence.
Dorner, Ida J.
Dougherty, Nelly M.
Dowling, Mary.
Dougan, Viola.
Doyle, Etta B.
Doyle, Frances.
Doyle, Kathryn B.
Doyle, Margaret.
Doyle, Nellie.
Drew, Margaret.
Drew, Susan.
Dudenbostel, Louise.
Duggan, Laura F.
Dunn, Catherine L.
Dunham, Edith R.
Dudley, Irene.
Durnin, Margaret.
Durow, Martha.
Dwyer, Emma.
Dwyer, Phoebe.
Dwyer, Mary.
Eastman, Elizabeth.
Ehbets, Pauline.
Ehrenhardt, Mabel.
Eiche, Adela.
Eimer, Hildegard.
Ein Waldt, Anna.
Elftman, Josephine.
Elgeti, Elizabeth.
Elmer, Flora H.
Elting, Jessie V.
Engel, Clara.
Engelhardt, Clara E.
Eimermann, Mrs. A. J.
Endris, Dorothy.
Epstein, Tillie.
Erbach, Clara.
Erbach, Ida.
Ericson, Jennie.
Evangelist, Sister Mary.
Evans, Frances B.
Evans, Marguerite.
Ewald, Louise.
Fagan, Annie M.
Fahsel, Agnes.
Fallon, Margaret.
Farley, Katherine E.
Fawcett, Margaret.
Fecht, Ella V.
Fehrenkemp, Winifred.
Fellows, Jane M.
Feix, Helen A.
Ferguson, Martha.
Fiedler, Amanda.
Finan, Ellen F.
Fisher, Phobe.
Fischer, Margaret.
Fishman, Alice M.
Fishman, Elizabeth.
Fishman, Nellie C.
Fitzsimmons, Katherine.
Fitzsimmons, Margaret O.
Fitzsimmons, Martha V.
Fitzsimmons, Mary E.
Flanagan, Elizabeth.
Flanagan, Rose.
Fleischmann, Lillian E.
Fleming, Lucinda E.
Foley, Anna L.
Foley, Kathleen H.
Foley, Mary L.
Foote, Lydia M.
Foran, Mary.
Forrest, Ada A.
Forrestal, Elizabeth.
Forrestal, Mary A.
Fosbinder, Sarah.
Foster, Ida.
Foulkes, Eugenia M.
Fowler, Lotta B.
Fowler, Myrtle.
Fox, Helene R.
Frahm, Alvina.
Frane, Alba K.
Franey, Mary E.
Fraser, Rebecca S.
Frawley, Kittiebelle.
Fredrich, Ida.
French, Margaret A.
Frick, Olga.
Froemming, Esther.
Frye, Winifred.
Fuchs, Theresa.
Fuller, Gertrude E.
Funk, Mary L.
Furey, Kathleen.
Gaertner, Estella.
Gaffney, Grace.
Galligan, Annie V.
Ganske, Grace V.
Gapen, Flora.
Gapen, Mildred.
Garbes, Irene.
Gardner, Cecilia.
Gardner, Emma J.
Gardner, Ethel M.
Garnett, Alice.
Gault, Miss.
Gay, Greta B.
Geerlings, Alice.
Geerlings, Mary.
Gebhardt, Emma W.
Gede, Gertrude.
Geil, Johanna.
Geilfuss, Alma.
Geidel, Addie.
George, Adda Gentry.
Geraghty, Sara L.
Geraghty, Sara.
Gerber, Lina M.
Gere, Mary.
Gertrude, Sister M.
Geske, Margaret.
Gibbon, Minnie L.
Gielow, Eleanor T.
Gilbert, Mrs. O. G.
Gilbreath, Charlotte.
Gillick, Anne.
Gillick, Margaret L.

MEMBERSHIP LIST—WOMEN—continued.

Gilligan, Anne.
Glatz, Emily S.
Glaubitz, Frieda.
Glaubitz, Hildegrade.
Glidden, Jennie S.
Goeltzer, Clara.
Goetz, Emily.
Goldie, Anne I.
Goodman, Minnie B.
Goodrich, Mrs. Fred.
Gould, Marie F.
Gowran, Grace E.
Grace, Esther.
Grace, Josephine.
Grace, Mayme.
Graef, Elizabeth.
Graffenius, Hertha.
Grant, Genevieve.
Grant, Minnie.
Gray, Marion.
Gray, Rilla S.
Grebel, Anna.
Grebel, Mrs. Johanna.
Green, Mrs. Howard.
Greenwood, Grace B.
Greubel, Anna.
Griese, Charlotte.
Griffiths, Ellen J.
Griffiths, Mima S.
Grouinger, Linda.
Griswold, Anna M.
Grubb, Mattie L.
Gruber, Elsia.
Grueltner, Hilda A.
Guequierre, Alice.
Guequierre, Claire D.
Guequierre, Lucy.
Guequierre, Sara.
Gummersheimer, Hilda.
Gumpert, Emmy V.
Haack, Paula J.
Haas, Erna.
Haessler, Clara.
Hansler, Henrietta.
Hagedorn, Mrs. E. Kading.
Hainke, Elfrieda A.
Haisler, C. Elizabeth.
Haisler, M. Louise.
Halbert, Amy.
Hale, Lucy D.
Hale, W. E.
Halfen, Mary S.
Hall, Marcella.
Halsey, Myra.
Haney, Madeline.
Hannan, Joanna A.
Hannan, Katherine.
Hannan, Mary E.
Hausen, Anna.
Hauson, Elma.
Hardwick, Anastasia.
Harkins, Ella.
Harley, Kath.
Harm, Lulu K.
Harney, Edith J.
Harper, Maggie M.
Harrington, Elizabeth T.
Harris, Sophia.
Hassman, Ethel.
Hastings, Jennie.
Hauboldt, Laura.
Hauser, Daisy A.
Hawes, Ida M.
Hayes, Margaret B.
Hayes, Mary E.
Hayes, Mary V.
Hawkins, M.
Heid, Bertha.
Heineman, Maud R.
Heineman, Stella.
Heintzen, Lucy M.
Heise, Dora.
Heitman, Miss.
Helen, Sister M.
Hellberg, Anna.
Heuel, Alma.
Henes, Catherine.
Henika, Louisa M.
Henkel, Almira.
Henkel, Isabel.
Herbert, Fannie.
Herirt, A.
Hermann, Esther.
Hermann, Flora B.
Hey, Adelaide.
Heyn, Fanny.
Hickey, Ellen M.
Hickey, Fanny.
Hickey, Louise M.
Hickey, Mabel.
Hickey, Mary F.
Hickey, Sarah.
Hickman, Addie F.
Hickox, Alerr P.
Hinrichs, Lillian A.
Hoeking, Mabel.
Hoefer, Lillie.
Hogan, Cath.
Hogan, Emalyn Z.
Hogan, Katharine.
Hogan, Laura.
Hohgrefe, Anna.
Holcomb, Clara S.
Holcombe, Alice J.
Holcombe, Fannie B.
Holcombe, Mary C.
Holden, Helen M.
Holehouse, Katherine.
Holmes, Ruth.
Holub, Libbie.
Homewood, Genevieve M.
Honadel, Isabella.
Hopkins, Eugenia.
Hoppin, Edith.
Horning, Olive.
Horn, Elfrieda.
Horn, Inez.
Horrigan, Anna.
Hortense, Read.
Houghton, Madge.
Howe, Mary K.
Howe, Nellie L.
Howell, Anna.
Howell, Jean.
Hoyt, Miriam.
Huebner, Emmy.
Hudecheck, Mary J.
Hughes, Emma.
Hughes, M. Emma.
Hughes, Laura.
Hull, Gertrude.
Hunt, Cora H.
Hunt, E. Dela.
Hunz, Esther.
Hurlbert, Lillian.
Hurlbert, Ruth.
Hyatt, Bessie.
Hyland, Estelle.
Imig, Lyla E.
Isaac, Clotilde.
Ische, Alvina.
Ische, Clara C.
Jacobson, Amelia.
Jahr, Irene.
Jannes, Estelle.
Jelinek, Frances.
Jelinek, Marie.
Jensen, Anne W.
Jergenson, Ella.
Jern, Esther V.
Johnson, Alicek.
Johnson, Ann E.
Johnson, Katherine.
Johnson, Mabel L.
Johnston, Ruth F.
Johnston, Susan.
Jones, Alice B.
Jones, Elizabeth.
Jones, Ella.
Jones, Helen N.
Jones, Laura.
Jones, Sarah D.
Jordan, Mary I.
Josephine, Sister M.
Judell, Anna.
Jung, Augusta.
Kabet, Amanda.
Kahlo, Elsa.
Kane, Marion R.
Kanneberg, Ella.
Karel, Flora.
Kaross, Ella B.
Kaross, Martha.
Karrasch, Anna L.
Kassner, Sonia.
Katz, Rosa J.
Kaufer, Julia.
Kauffung, Matilda.
Kaufmann, Sarah.
Kavanaugh, Kath.
Keating, Alice.
Keller, Marie V.
Kelly, Helen.
Kelly, Joanna.
Kelly, Mary E.
Kelly, Mary P.
Kelly, Mary T.
Kelsey, Rachel.
Kemink, Minnie G.
Kennedy, Gertrude.
Kenney, Margaret.
Keogh, Katherine.
Kerble, Lucy.
Kessler, Doris H.
Keyes, Edna J.
Kieni, Mary.
Killian, Margaret E.
King, Anna.
Kinney, Clara E.
Kippenberger, Marie.
Kirby, Margaret.
Kirby, Nellie.
Kitchel, Anna.
Klatti, Bertha.
Kleist, Emmy.
Klingeberger, Marie.
Klingelhoefer, I.
Klingholz, J.
Klippel, Vene.
Klumb, Marion E.
Kneeland, C. S.
Knight, Gertrude.

MEMBERSHIP LIST—WOMEN—continued.

Knowles, Miss.
Koerner, Julia A.
Kooes, Johanna.
Koeslay, Wilhelmina.
Kohl, Clara L.
Koontz, Mabel.
Kootnauer, Annette.
Krauslach, Kate.
Kranzwech, Clara E.
Kratsch, Louise I.
Krauslach, Emma.
Kress, Emma O.
Krieger, Cornelia.
Krieger, Freda.
Kriesel, Helen W.
Kriesel, Myra C.
Kriz, Aggie B.
Kroes, Carrie G.
Kroes, Eva M.
Kroetz, Millie E.
Krock, Lucy C.
Kronshage, Mrs. Theodore.
Kuechenmeister, F.
Krueger, Erna.
Krueger, Marie.
Krueger, Olive.
Krumdick, Elsie.
Kuehnae, Ida.
Kuehne, Anna.
Kuenzli, Caroline.
Kuepper, Emma.
Kuepper, Julia.
Kuckuck, Lillian.
Kugler, Minnie.
Kurz, Henrietta H..
Kussel, Henrietta.
Kussel, Tiby.
Lachet, Marie.
Ladwig, Valesca.
Lakin, May M.
Landgraf, Eda.
Lane, Loretta.
Lantry, Alice F.
Lantry, Mary.
Larkin, Mary E.
Laurell, Antonie L.
Lawrence, Laura.
Lawrence, Rose.
Laws, Alexandrina.
Leach, Carrie.
Leard, Margaret.
Lederer, Harriet S.
Lee, Lullie.
Lee, Alice.
Lehnhoff, Hattie.
Lreidel, Ida E.
Leonard, Ella A.
Lessel, Anna.
Leviash, Rose.
Levy, Carrie.
Levy, Estella.
Levy, Minnie.
Lewis, Mabel E.
Liebig, Elsa.
Liebmann, Frieda.
Lingeman, Rose.
Lobin, Irene M.
Lohr, Alvina H.
Lomire, Maude B.
Loomis, Elizabeth E.
Loos, Emma.
Loos, Clara.
Lorenz, Josephine.
Low, Ruth.
Lucas, Amelia.
Luebke, Almira J.
Luebke, Emma J.
Luebke, Ottilie E.
Lueders, Victoria.
Lugg, Mary L.
Luhreen, Agnes.
Lumena, Sister.
Lusk, Grace A.
Lusk, Nealie.
Lutter, Anna.
Lynch, Bessie.
Lynch, Ella.
Lynch, Emma M.
Lynch, May E.
Maas, Mollie.
Mac Alees, Anna A.
Mackay, Elizabeth.
Madden, Anna M.
Madden, Hazel.
Madden, Helen.
Madleuer, Elsa E.
Maher, Mary.
Major, Jennie.
Malachowitz, Emma.
Malone, Julia.
Malone, Rachel.
Maloney, Carrie.
Maloney, Sara M.
Manthey, Clara.
Marchant, U.
Marine, Merle.
Marks, Hannah.
Marquardt, Ida.
Marshall, Alice.
Marshal, Florence M.
Marshall, Kate C.
Marshall, Mina.
Mottram, Grace.
Martin, Esther.
Martin, Katherine.
Martin, Minna.
Mater, Emma H.
Mathews, M. Alice.
Mathews, Daisy.
Matthews, Frances.
Mayer, Edna.
McAuley, Leon.
McCabe, Catherine.
McCabe, Isabel.
McCabe, Kate.
McCabe, Kate C.
McCabe, Mary.
McCusker, Anna.
McCusker, May J.
McDermot, Marguerite.
McDowell, Fannie.
McDonald, Kathryn.
McDonald, Mary.
McEathron, Lois.
McEvoy, Sarah.
McGrath, Mary.
McGuigan, Annie.
McIlree, Sarah J.
McIver, Elizabeth.
McHenry, Avis.
McHugh, Annie.
McHugh, Jennie.
McKenna, L. Mayme.
McKenna, Sara.
MacKenzie, Lou.
McKillopp, Jeanette R.
McLeod, Mrs. James.
McMahon, Mary.
McMillen, C. Jean.
McMinn, Amelia.
McNeil, Maud.
McQueeney, Mabel.
McRavey, M.
McShane, Margaret.
Mechler, Lucia A.
Meckenhausee, Olga E.
Meehan, Anna.
Meinecke, Emily.
Meiners, A.
Meiners, Louise.
Mellen, Jane F.
Mendel, Louise.
Meny, Alice.
Menzel, Flora.
Meredith, Sara A.
Merkt, Fannie M.
Meyer, Cora E.
Meyer, Gertrude.
Michaelis, Sophia.
Millard, Helen.
Millard, Laura.
Millar, Edna R.
Millar, Ida.
Miller, Mary.
Miller, Myrtle F.
Miller, Rose.
Millmann, Anna.
Milnitz, Lillie L.
Mills, Katherine.
Mills, Lillian.
Minahan, Ellen L.
Minehan, Nellie.
Mitchell, Margaret E.
Moffet, Mae.
Mohr, Meta.
Monaghan, Teresa F.
Moore, Ella.
Monteith, May.
Moody, Isabel A.
Moody, Mary A. T.
Moore, Ruth.
Moran, Berdice J.
Moran, Elizabeth M.
Moran, Florence.
Moran, Katherine.
Morgan, Elizabeth E.
Morlock, Tillie.
Morris, Mary.
Morrison, Mrs. J. C.
Morrison, Blanche.
Morrissy, Katherine.
Mosher, Cora E.
Mosher, Estelle.
Morse, Alice C.
Moss, Lilly.
Moulton, Lucretia I.
Mueller, Amelia.
Mueller, Evelyn.
Mueller, Tillie D.
Murphy, Caroline M.
Murphy, Josephine F.
Murphy, Mary G.
Murtaugh, Catherine.
Murtha, Sister M.
Muth, Anna C.
Myers, Bessie M.
Nelson, Grace O.
Nelson, Pearl M.
Nelson, Stella.
Nerman, Anna C.
Newmann, Hildegard.
Newbouer, Florence.
Nichols, Edna H.

MEMBERSHIP LIST—WOMEN—continued.

Nichols, Jessie L.
Nichols, Mae.
Nicholson, Clara.
Nicholson, Flora.
Niedecker, Evelyn.
Niedermann, Lillian M.
Nienow, Emily A.
Nieser, Louise.
Noble, Ella E.
Noerenberg, Elsa A.
Norris, Mrs. C. W.
Northern, Mary.
Northrup, Mary.
Norton, Ruth W.
Nott, Ruth.
Notz, Natalie.
O'Brien, Loretto.
O'Brien, Mary F.
O'Brien, Rose A.
O'Connor, Nellie.
Officer, Florence G.
Ogden, Marion.
O'Hara, Alice.
O'Hara, Fannie.
Olcott, Emma.
Oldenburg, Lucy.
Oldeweld, Clara.
Olsen, Julia E.
Olson, Myra.
Olwell, Alice.
O'Malley, Helen.
O'Neill, Gertrude.
O'Niel, Lillian.
O'Niel, Mamie E.
O'Niell, Margaret J.
Oppen, Lillian M.
Ormsby, Anna C.
O'Sullivan, Eugenia.
Ott, Adelaide.
Otterol, Evelyn.
Ovitz, Delia.
Owens, Augonetta.
Paine, Mabel A.
Pakenham, Margaret.
Palmer, Julia.
Palutzke, Mary.
Papenhagen, Martha M.
Parker, Alice V.
Parnkopf, Hattie M.
Parsons, Ada.
Partenfelder, Martha.
Pashelles, Carrie.
Pastall, Anna G.
Patels, Alma.
Patzer, Mrs. C. E.
Payn, Nina.
Payne, F. E.
Payne, Florence I.
Peabody, Amy.
Pearse, Ada H.
Pearson, Mariam.
Peckham, Mary.
Peppard, Joseph M.
Peters, Elizabeth.
Peter, Elsa.
Peters, Henrietta.
Peters, Susie.
Peterson, Mary B.
Peterson, Minnie.
Peterson, Pauline.
Peterson, Pearl.
Pfeiffer, Mattie E.
Pfoertsch, Amelia.
Pfoertsch, Dina.

Phelps, Ella.
Phillips, Eleanor A.
Phillips, Mary A.
Piepenbrink, Louise.
Pierron, Martha.
Pinning, Emma M.
Pitman, Olive A.
Pohl, Pearl S.
Pokorny, Lucy.
Pollard, Josephine.
Pollard, Marion.
Potter, Mabel E.
Post, Harriet L.
Pranke, Helen M.
Pratt, Alice M.
Pratt, Mabel C.
Price, Hanna E.
Price, Rachel M.
Price, Winifred.
Prideaux, Annetta.
Prideaux, Katherine.
Pritchard, Camilla.
Proehl, Tabra.
Pruess, Selma O.
Punch, Ella D.
Purcell, Mary.
Purtelle, Florence.
Purtell, Loretto.
Quinn, Jennie.
Raasch, Meta.
Rader, Minnie.
Rahr, M.
Ralph, Myrtle E.
Rasmussen, Myra J.
Rathmann, Louise.
Redfern, Mary E.
Regan, Julia.
Rehnquist, Judith.
Reik, Essie.
Reilly, Grace M.
Reinke, Gertrude L.
Rennebohm, Adelia.
Renz, Emilie.
Reynolds, Anna M.
Reynolds, B.
Reynolds, Clara.
Reynolds, Edith M.
Reynolds, Frieda.
Rice, Margaret.
Rice, Myrtle D.
Rice, Sadie.
Riedel, Cathinka.
Rieger, Emily M.
Rich, Mary.
Richardson, Mary.
Riley, Agnes M.
Riordan, Agnes.
Roberts, Agnes I.
Robertson, Maude M.
Robrahn, Frances.
Rockwell, Ethel.
Rodee, Florence B.
Rodee, Nellie.
Rodman, Mary D.
Roeffs, Constance.
Roethke, Louisa.
Rodgers, L. Claire.
Rohr, Illena M.
Roller, Edith.
Rose, Elizabeth.
Rose, Gertrude C.
Ruebhausen, Ella E.
Rusch, Ella A.
Ruschhaupt, Anna.

Ryan, Rose A.
Rynders, Ella E.
Sabin, Ellen C.
Sadley, Elizabeth.
Salisbury, Florence.
Sallmann, Lizzette.
Sanborn, Anna L.
Sargent, May Ingalls.
Sarnow, Emily.
Schapekahn, Florence.
Sheffler, Elsie.
Scheinert, Amanda.
Scheinert, Emma M.
Schemmer, Paula.
Scheu, Anna.
Scheuk, Margareta.
Schlafer, Carrie.
Schmidt, Lydia P.
Schmitt, Margaret M.
Schmidtill, Babette.
Schmidtill, Henrietta.
Schneider, Mary.
Schoechert, Emma.
Schoenleber, Marie.
Schroeder, Elizabeth.
Schroeder, Ella L.
Schrubb, Dorothy.
Schuerbrock, Adele.
Schuerbrock, Josephine.
Schuette, Marie A.
Schuette, Marie A.
Schuler, Katherine.
Schuler, Mary.
Schulz, A.
Schulz, Elsie J.
Schumann, Hedwig.
Schuppert, Matilda M.
Schutty, Lotty.
Schwarting, Edith.
Schwarting, Hattie E.
Schwartz, Carrie.
Schwartz, Meta.
Scofield, Ethel.
Scott, Genevieve.
Scott, Isabella B.
Scott, Stella M.
Seidel, Louise I.
Seims, Ella.
Senti, Bertha.
Severance, Pearl W.
Shamm, Lulu.
Shaughnessy, Evelyn.
Sheehan, Julia A.
Skeinfeld, Rosalie.
Sheldon, Mabel.
Shields, Bessie C.
Shimmin, Lucy M.
Shinnick, Julia I.
Shinnick, Marion.
Showers, Eva.
Sidler, Agnes.
Sidler, Matie.
Sieker, Lillian C.
Silbar, Burnette.
Silver, Fanny.
Simonds, Lilian M.
Simonds, Marian.
Simpson, Jeanette.
Sinar, Fanny.
Singer, Etta.
Sinyard, Prudence E.
Skarda, Julia.
Skiles, Ethel.
Skiles, Geraldine.

MEMBERSHIP LIST—WOMEN—continued.

Skelding, Mary.
Slawson, Anna A.
Sloan, Elizabeth G.
Slosson, May.
Smeaton, Margaret.
Smith, Annie P.
Smith, Cecelia E.
Smith, Harriet E.
Smith, Ida.
Smith, Janet M.
Smith, Marion A.
Smith, M. Vail.
Smith, Nellie M.
Snyder, Myrtle.
Soik, Matta M.
Soloman, Elsa.
Sontag, Lillian V.
Spangenberg, Clara.
Spangenberg, Thekla.
Spencer, Bettie B.
Spies, Elizabeth.
Sprague, Florence.
Sproat, Katharine.
Spyker, Mattie A.
Stacy, Alice.
Stamm, Lulu.
Standish, Corinne.
Stark, Loella K.
Starkey, Mary A.
Steikle, Mrs. Joseph.
Steen, Adelaide M.
Steiner, Louise A.
Steinman, Elma.
Stemper, Olivia.
Stern, Florence V.
Stern, Julia.
Stevens, D.
Stevens, Eva.
Stevenson, Jane A.
Stockhausen, Emma von.
Strass, Alice.
Strohm, Etta.
Strohm, Ines.
Strong, Emily N.
Strothman, Alda.
Suckow, E.
Suckow, Elsie L.
Suckow, Minnie.
Sullivan, Anna R.
Sullivan, Nellie.
Swain, Lou A.
Swett, Nettie A.
Swing, Janette.
Tabert, Anna H.
Tanish, Jean Elizabeth.
Taugher, Mary.
Taylor, Julia E.
Tennant, Elsie O.
Teweles, Lotta.
Thiele, Hattie.
Thies, Alice.
Thies, Mrs. H.
Thies, Lillian.
Theiss, Stella.
Thomas, Elizabeth.
Thornberg, Edith.
Tidmarsh, Genvieve.
Tiefenthaler, Laura.
Tillisch, Jane.
Tillson, Blanche.
Titus, Winefred.
Tollefson, Mrs. Emma H.
Tomelty, Mary.
Toohey, Maria.
Torney, Juliana.
Torney, Norma.
Torphy, Anna.
Trapp, Bertha.
Trapschuh, Belle A.
Trautwein, Sarah M.
Trayser, Frances.
Treat, Anna B.
Treat, E. C.
Trieschmann, Anna.
Tutkin, Ida.
Tyre, Anna.
Tyre, Olga.
Vandewalker, Nina C.
Vasey, Julia.
Villiesse, Alma.
Vollmar, Carrie L.
Van Dyke, G.
Van Sas, Alida P.
Van Schaick, Emma.
Van Scoy, Mrs. L. B.
Von Cotzhausen, Laura.
Uber, Anna.
Ulbrecht, Lydia.
Ulrich, Elfa L.
Utermark, Henrietta.
Wackholz, Margaret.
Wagner, Adele.
Wagner, Frieda.
Waigli, Eleanor.
Waldron, Jessie E.
Walker, Ida H.
Walker, Isabel R.
Wallber, Clara.
Wallber, Irma.
Walsh, Elizabeth M.
Walsh, Frances.
Warburton, Frankie.
Ward, Agnes.
Ward, Josephine.
Warner, Blanche M.
Warth, Bertha.
Warzinik, Anna.
Watermolen, Belle.
Watson, Jean.
Watts, Edith L.
Weber, Lucile.
Weber, Nellie C.
Wechselberg, Margaret.
Wedekind, Martha.
Weggins, Helen.
Weihe, Laura.
Weiland, Margaret.
Weinberger, Jennie D.
Weinstein, Albertine.
Weiss, Laura A.
Welch, Bessie E.
Welch, Gracia.
Welch, Isabella.
Welch, Julia.
Welch, Nellie A.
Weld, Rena.
Wells, Viola.
Welsh, Mary R.
Weltzein, Annie.
Weltzien, Lena M.
Wendt, Lillie E.
Wenzell, Rilla.
Wersing, Josephine.
Wetherby, Mary A.
Wettig, Anna.
Wettig, Caroline.
Wettstein, Frances.
Whalen, Adele.
Wallen, Nettie M.
White, Edith.
White, Mary E.
White, Nellie.
Whitehead, Bertha E.
Whitley, Alice S.
Wiegand, Marie.
Williams, Anna C.
Williams, Elizabeth G.
Williams, Frances M.
Williams, Katherine R.
Williams, Lydia.
Williams, Mary L.
Williams, May.
Williams, Maud J.
Willis, Maud.
Wilson, Adelaide.
Winkler, Rosalie.
Winton, Florence.
Wirth, Lillie.
Wise, Pauline.
Wisner, Emma.
Witte, Louise A.
Wittey, Genevieve.
Wittmann, Helen.
Wolf, Mary.
Wood, E.
Woodman, I. L.
Worms, Jessie.
Wright, Ethel.
Wright, Helen Ethel.
Wuerst, Frances A.
Yorgey, Sarah.
Zahl, Elsa.
Zahn, Nellie.
Zassenhaus, Mary.
Zinns, Ilma.
Two Blanks, 5284 and 6017

MINERAL POINT.

Ivey, Mary.
Ivey, Nellie.
Pierce, Florence L.
Prideaux, Nettie G.

MINOCQUA.

Ames, Mabel.
Bailey, Barbara Jean.

MISHICOT.

Ruby, Anna.

MOGARA.

Verflausch, Helen.

MONCHES.

Shields, Mary.

MONTELLO.

Donaldson, Lizzie.

MONTICELLO.

Blum, Edythe.
Dagenhart, Ethel.
Elmer, Adell.
Virgin, Emma.

MEMBERSHIP LIST—WOMEN—continued.

MONROE.

Burgi, Margaret K.
Brunnen, Clara Jane.
Byers, Grace.
Chambers, Ella M.
Corson, Harriet.
Freeman, Ellen.
Gardner, L.
Gettings, Teresa J.
Gribble, Greta M.
Heitz, Maud.
Lounsberry, S. E.
Neumeister, Alma E.
Post, Kate.
Schiesser, Kathryn.
Schiesser, Margaret.
Sullivan, Helen.
Summeril, Nellie.
Tschudy, Annetta.
Van Weger, Emma.
Ward, Mrs. Sarah.
Washburn, Martha.
Wilke, Adelaide E.
Zimmerli, Marie.

MT. HOREB.

Angell, Nellie.
Arneson, Matilda.
Gramm, Alice M.
Grover, Alice M.
Ryan, Mary.
Ryan, Nora.

MORRISONVILLE.

Starks, Susan.

MUKWONAGO.

Chapin, Nellie.
Craven, Rosamont.
Fardy, May.
Hiffron, Gertrude.
Kelley, Marie.
Martin, Margaret.
McNutt, Merna.
Skuldt, Nina.
Titus, Nettie.
Titus, May.
Tobdell, Ruth.
Van Buren, Clara.
Young, Gladys.

MUSKEGO.

Meade, Gertrude.

NASHOTA.

McGrath, Margaret.

NEENAH.

Frank, Nellie.
Helmer, Carrie M.
Meadows, Blanche.
Scott, Fern.
Timmie, Cora.

NEILLSVILLE.

Taylor, Lillian.
Usher, Florence.

NEOSHO.

Clason, Berta E.
Connell, Margaret.

NEW HOLSTEIN.

Dumke, Laura C.
Harter, Emma.
Ruppenthal, Ottilie.
Sell, Rose.
West, Edna.

NEW LONDON.

Archibald, Carrie.
Bleck, Clara.
Caren, Jenniette.
Davis, Vera.
Deunhardt, Loraine.
Ekern, Olga H.
Foote, Gladys.
Higbee, Hazel.
Kobler, Beulah Delight.
Kobler, Maud.
Lewis, Cassie.
Loughrin, Mary.
Mulroy, Alice.
Owens, Elizabeth.
Racine, Blanche.
Schlaefer, Luella.
Thompson, Dora B.
Webber, Jennette.
Willet, Emma.
Wochos, Frances.
Yelland, Edith.

NEW RICHMOND.

Epley, Grace.

NORWALK.

Hulbert, Elsie.
Lloyd Jones, Maud.

NORTH FOND DU LAC.

Burt, Martha L.
Clark, Emily M.
Dunlap, Ellen Mae.
Hardgrove, Mary T.
Phelps, Metta.

NORTH LAKE.

Emslie, Myrtle.

NORTH MILWAUKEE.

Hausen, Mollie.
Kane, Florence.
O'Brien, Marie.
Parr, Susanah.
Sievers, Mrs. P.
Stapleton, Margaret.

NORTH RACINE.

Crane, Althea.

OAKFIELD.

Binnie, Nora Belle.
Brietkreutz, Elsa.
Donaldson, Elwina.
Watson, Jessie.

OAKWOOD.

Garland, Ruby.
Hahn, Martha.
Kleinmann, Cora.
Kuehne, Irma.
Meyer, Josiphine.
Warzynakoski, Antoinette.

OCONTO FALLS.

Schaub, Mrs. A. E.

OCONTO.

Fitzgerald, Catharine.
O'Keliher, Nora.
McDonald, Ellen B.

OCONOMOWOC.

Bertleson, Bessie.
Erickson, Nellie.
Mengel, Anna.
Mengel, Ella.
Miles, Mary.
Reid, Blanche.

OMAHA, NEB.

Barnum, Virginia.

OMRO.

Glisson, Ethel K.
Gordon, May.
Hulbert, Mary E.
King, Josephine.
Melcher, Hazel.

OOSTBURG.

Wordes, Marion.

OREGON.

Byrne, Genevieve.
Emery, Maude M.
Pietsch, Dora.
Verran, Laura E.

ORFORDSVILLE.

Covey, E. Blanch.
Kelly, Jessie.

OSHKOSH.

Allen, Mary.
Bacon, Helena.
Baker, Ellen M.
Baldwin, Louise.
Barney, Sybil.

MEMBERSHIP LIST—WOMEN—continued.

Barr, Katharine.
Benjamin, Addie B.
Bouck, Theresa F.
Casey, Charlotte.
Castle, Ellen.
Chase, Hazel F.
Christensen, Anna M.
Clark, Lillian.
Clark, Margaret D.
Clark, Theodosia.
Cooper, C. L.
Cottrell, Prudence.
Day, Edith.
Duhn, Katharine I.
Edgarton, Alma S.
Edwards, Gertrude.
Evans, Mabel.
Foulk, Josephine.
Friday, Clara.
Gibbon, Mary B.
Gulliford, Bessie.
Hagilthorn, S. E.
Halsey, Cora M.
Hamilton, Mabel.
Hardgrove, Ellen.
Hayden, Estelle.
Hebel, Linda.
Horst, Anna E.
Hubbard, Belle.
Humphrey, Clara.
Johnston, Emily B.
Jones, Ella.
Jones, Nellie B.
Kennedy, Dora C.
Kenny, Monica.
Kusche, Anna E.
Mehder, Kate L.
McConochie, Margaret.
Morgan, Lotta L.
Murdock, Eugenia.
Murdock, Mary E.
Noyes, Helen.
Owens, Sadie I.
Oxholm, Jennie T.
Pause, Lillian.
Peiffer, Ella.
Pettigren, Bessie.
Pierce, Josephine.
Randall, Alice E.
Reiss, Ella L.
Remer, Elizabeth.
Rice, Lucina.
Richter, Alma.
Robinson, Emily.
Rogers, Clara L.
Rogers, Daisy E.
Savage, Jessie M.
Scott, Emma.
Senn, Ethel.
Shenick, Edna D.
Sherburne, Marie.
Snell, Ethel M.
Spalding, Florence.
Steinfort, Meta.
Thompson, Grace.
Turner, Mary.
Whitney, Florence.
Whitney, Myrtle.
Wohler, Aela.
Van Luven, Verna.

OXONTA.

Shores, Amy Carlin.

PALMYRA.

Cattanach, Lila A.
Cutler, Katherine A.
Fairbrother, Emma.
Giles, Alice.
Morris, Norma.
Phillips, Nellie C.
Smith, Dora.
Smith, Mabel.

PARDEEVILLE.

Cuff, Katie.
Cushman, Inez.
Doepke, Anna L.
Rogers, Bessie I.
Sawyer, Olive.
Stevens, Georgia.
Turner, Daisy.

PEEBLES.

Murphy, Nellie.
White, Florence.

PESHTIGO.

Burnham, D. M.
Luke, Wilhelmina.
Nelson, Mary L.

PEWAUKEE.

Blodgett, Mabel.
Buchen, Alma C.
Dowd, Mary E.
Eustice, Ollie.
Fox, Shirley G.
Hayes, Jessie.
Hayes, Mavivam.
Jones, Ruth.
Macek, Libbie.
Nelson, Agnes M.
O'Connor, May.
Procknow, Bertha J.
Stahlman, Julia.

PHILLIPS.

Goessling, Hattie.
Kelleher, Marie.
McNely, May.
O'Malley, Alice.
Simon, Florence.

PINE RIVER.

Morse, Belle.
Morse, Mariam.
Stetson, Belle.

PLAINFIELD.

Buck, Sara E.
Laing, Mabel L.
Manor, Emma E.
Montgomery, Eliza J.
Ostrum, Floril L.
Storm, Anna.
Williams, Elizabeth.

PLATTEVILLE.

Brigham, Agnes O.
Cobams, Jennie.
Caradine, Elva Jane.
Chase, Madelaine.
Churchill, Bessie.
Dinsdale, Grace.
Hargrave, Mary.
Hendershot, Eulalia.
Hindkreson, Mina.
Granahan, Agnes.
McGranahan, Agnes.
Weld, Laura H.

PLYMOUTH.

Cole, Jessie.
Dennersein, Roma.
Dietsch, Leila.
Du Fom, Laura E.
Eastman, Eugenie.
Goelzer, Verna.
Hughes, Effie.
Isserstedt, Freda.
Krumrey, Adelaide.
Krumrey, Paula.
Lindstrum, Emily.
Luth, Adele.
Meyer, Myrtle.
Parrish, Grace.
Proehl, Lydia.
Reed, L. M.
Sanders, Mary.
Simmons, Gertrude.
Straub, Adalia.
Ulbrecht, Minnie.

PORT WASHINGTON.

Anderson, Elsie.
Biedermann, Alvina.
Bryant, Bessie M.
Burrell, Alfred C. (?)
Case, Florence D.
Delles, Frances.
Godersky.
Harrison, Golda.
Jacobsen, Emma.
Keller, Flora.
King, Mary A.
Kratzer, Emma.
Leffingwell, Laura T.
Lynch, Ella.
Mulloy, M.
Malherbe, Caroline.
Potter, Alice.
Ryordan, Carrie.
Schmit, Margaret.
Schwinn, Adela.
Schlenboyth, Louise.
Smith, Helen Hazel.
Stephens, Grace.
Van Nostrand, Nata A.
Weaver, Mabel.
Wenzel, Melania.
Young, Mrs. Christina.

PORTAGE.

Clark, Mabel.
Johnson, Mabel.
Kathleen, Sister.
Kelly, May G.

MEMBERSHIP LIST—WOMEN—continued.

Lauderdale, C. M.
Luchsinger, Edna.
Marie, Sister.
Owen, Grace.
Parsons, Lura E.

PRAIRIE DU CHIEN.

Deary, Mona.
Garron, Leona.

PRAIRIE DU SAC.

Harvey, Vinnie.
Meyer, Elzena.
Quimby, Jessie.

POYNETTE.

Kasten, Mrs. A. W.

PRINGLE.

McCue, Nellie.

PRINCETON.

Bramer, Alice.
Moeschler, Clara.

RACINE.

Allen, E. Maude.
Anderson, Ida.
Andrews, Bernice.
Arps, Elnora.
Ashby, Annie.
Ashby, Mary.
Babcock, Ella L.
Baden, Elizabeth.
Bagnall, Bessie M.
Banting, Lillian.
Barr, Ethel E.
Behrens, Marie.
Bennett, Kathryn.
Blake, Stella.
Bolton, Louise.
Braun, M. Amanda.
Brewer, Ruth.
Britten, Lois.
Brown, Mary Alice.
Brownell, Dona.
Buck, Charlotte.
Buckley, Elizabeth.
Byerly, Esther.
Carver, Pearl.
Chadwick, C. M.
Christopherson, Luella K.
Christensen, Anna.
Christensen, Bertha.
Christensen, Dora.
Christensen, Emma D.
Church, Anna.
Clancy, Anne L.
Clancy, Mary.
Clinton, Grace R.
Colbert, Adelaide.
Craig, Rose S.
Crocker, Edith M.
Derby, Florence.
Ditch, Anna Caree.
Dresser, Iva M.
Dunn, Irene M.
Dysart, Lulu M.
Easson, Edith.
Ellis, Annie.
Ellis, Ruth I.
Eunis, Eudora E.
Evans, Elizabeth.
Everhard, Bessie M.
Fahey, Catherine.
Fahey, Genevieve.
Fahey, Mamie A.
Fahey, Mayme R.
Foote, Elizabeth.
Fos, Ella F.
Foxwell, Alice.
Fuller, Jessie.
Gallager, Mary L.
Gavory, Katharine A.
Gilday, Kathryn.
Glessing, Barbara.
Gorton, Anne.
Govier, Ida L.
Graham, Genevieve.
Graham, Verna B.
Graves, Lucia.
Grimes, Katherine.
Gunthrie, Dorothy B.
Hanson, Elizabeth.
Hansen, Jenny.
Hausen, Lily.
Hart, Margaret.
Harcus, Grace Elliott.
Harvey, Elizabeth.
Harvey, Harriet A.
Hatch, Elsbeth.
Hedke, Ida.
Henderson, Pansy.
Hess, E. Elvise.
Hilt, Kathrine.
Hinchliffe, Jessie A.
Hood, Elizabeth.
Hughes, Della.
Hume, Mary Fitch.
Jensen, Jessie C.
Johnson, Ada.
Johnson, Amanda.
Johnson, Anna.
Johnson, K.
Jones, Cassie.
Jones, Mabel.
Jones, Gretta.
Jones, Elizabeth.
Joyce, Minnie.
Kelly, Hazel B.
Kelley, H. B.
Kenney, Agnes M.
Killian, Ariel.
Kimpel, Laura.
King, Julia E.
Kincaid, Margaret S.
Kuster, Frances.
Lennox, Nell M.
Lewis, Mary.
Lightcap, Laura A.
Liljegren, Alice V.
Mainland, Barbara.
Mainland, Christie S.
Maulsby, Anna.
Mauger, Gertrude.
McCarthy, Lillian.
McDermott, May A.
McGrath, Kathryn.
McIntosh, Louise.
McKenney, Jessie.
Milliman, Louise J.
Mohr, Luella A.
Mohr, Nellie K.
Morse, Harriet.
Morse, Margarette E.
Morey, Edith.
Mott, Marcia.
Murphy, Mame.
Murphy, Mary A.
Naylor, Ida B.
Nelson, Hulda.
Neumeister, Alma M.
O'Farrell, Margaret.
Oliver, Emma L.
Olson, Amanda.
Parent, Carrie A.
Peterson, Amanda.
Pendleton, Estilene.
Pfleger, Flossy.
Pond, Addie C.
Porter, Susan M.
Powers, Irene.
Prevost, Amelia M.
Proctor, Hettie.
Pugh, Katharine.
Rapps, Carrie.
Regan, Kathryn.
Reid, Ruth.
Rendall, Elizabeth.
Robinson, Mabel P.
Robertson, Mary E.
Roe, Nettie E.
Rowan, Catharine L.
Rowan, Mary V.
Samuel, Emma L.
Satterthwait, Gladys.
Scofield, Jennie.
Show, Gertrude.
Sieb, Zettie E.
Smith, Marion B.
Speer, Gertrude A.
Stanley, Mary E.
Sullivan, Mary E.
Tait, Ellen R.
Tait, Jessie U.
Takin, Alicia S.
Trull, Louise.
Walker, Gertrude.
Wallace, Beulah Z.
Watts, Lillian.
Weber, Mary A.
Wheeler, Adalaide E.
Whitcomb, L. A.
Williams, Jennie.
Williams, Maude.
Wilson, Maud.
Winne, May Ellen.

RANDOLPH.

Albee, Bessie.
Cushman, Mary F.
Hoefs, Kaddie.
Jolliffe, Ethel M.
Ozanne, Eva A.
Roberts, Kathryn.
Sinclair, Hazel.
Thomas, Mary E.
Thomas, Margaret.
Winden, Mrs. J.

RANDOM LAKE.

Albrecht, Ida.
Clifford, Katherine.
Heyes, Harriet.
McLaughlin, Bessie.

MEMBERSHIP LIST—WOMEN—continued.

REEDSBURG.

Acheson, Lola.
Briene, Mary.
Byrne, Ida C.
Clough, Ethel P.
Dollar, Ferne V.
Dollar, Mrs. Harriet.
Hillisheim, Catharine.
Johnson, Agnes.
Kellogg, Grace.
Moran, Harriet.
Reynolds, Anna.
Shea, Nellie.
Slolte, Lydia.
Sprague, Helen M.
Stone, Anna.
Warning, Anna J.
West, Mariam.

REEDSVILLE.

Cavanaugh, Clara.
Brady, Alice.
McCarthy, Celia.
Heileman, Emma.
Dilling, Blanche.
Reinhard, Charlotte.

RED GRANITE.

Wittlin, Julia.

REWEY.

Willis, Mina A.

RHINELANDER.

Dean, Jennie K.
Lloyd, Eleanor.
Segerstrom, Signe.
Stiles, Clara.

RICHFIELD.

Hoffman, Katherine.
Schulters, Isabel.
Staesser, Aurelia.
Toner, Lillian M.

RICHLAND CENTER.

Bliss, Mrs. M. R.
Bliss, Mabel.
Bush, Maybell G.
Edsall, Winifred.
Ferguson, Anna.
Hess, Blanche.
Hurtgen, Marie.
Judd, Mabel.
Lamberson, Blanche.
Thatcher, Carrie.
Thatcher, Mattie.
Wood, Iva.

RIB LAKE.

Gay, Mary.
Raymond, Gleann.

RICE LAKE.

Fruin, Josephine.
Fulton, Katherine.

RIO.

Davis, Mary C.
Storie, Janet.
Tompkins, May.

RIPON.

Amend, Alma A.
Bintliff, Elizabeth Battle.
Bonnell, Alice.
Bunchy, May.
Callan, Alice.
Chaffin, Pearl J.
Clark, Carrie.
Conant, Ruby.
Dickinson, Grace.
Farnham, E. Maude.
Ferber, Sarah.
Goodell, Kate.
Hall, Jennie.
Hill, Edith C.
Johnson, Lillian.
Kommers, Jennie.
Lobb, Ida.
Moran, Mabel E.
Moulton, Mrs. Lewis H.
Pettibone, Alice.
Scott, Alice.
Trier, Laura K.
Wood, Lila E.
Zobel, Alma.

RIVER FALLS.

Zinn, Edna.

ROCHESTER.

Cocroft, Maude.
Willey, Mary.
Worden, Vera.

ROCKTON, ILL.

Watts, Mary.

ROLLING PRAIRIE.

Shinners, Lucy A.

ROME.

Howard, Ruth.

ROSENDALE.

Heuerson, Jennie B.
Johnson, Elsie.
Monroe, Margaret.
Shafer, Josephine.
Soper, Olive.

ROCKFIELD.

Cresin, Lillie.

SALEM.

Anderson, Anna C.

ST. FRANCESS.

Powderly, A. E.
Powderly, M. C.

SAUKVILLE.

Schneler, Anna.
Wollner, Thresa.

SAUK CITY.

Hahn, Mary F.
Parker, Amy.
Steinfort, Elvira.

SCHOFIELD.

Bentson, Myrtle.
Jaeckel, Emma.

SENECA.

Byrne, Mary Frances.

SHARON.

Bird, Eva.
Burgess, Ida M.
Curry, Edna.
Daniels, Mrs. L. J.
Kilison, Linnie M.
Richardson, Mrs. S. D.
Shager, Bertha.
Wallace, Eleanor.

SHAWANO.

Perry, Eva.
Pulcifer, Mayme.

SHERIDAN.

Larson, Dorothea.

SHELL LAKE.

Sabean, Izzetta.

SHEBOYGAN.

Albrecht, Edna.
Albrecht, Minnie F.
Ashby, Harriet.
Bachmann, Hazel.
Bertschey, Hortense.
Bitter, Elsie.
Broer, Mrs. F. W.
Bruins, Jennie M.
Colien, Clara.
Conner, Edith H.
Cox, Edna
Dean, Julia L.
Dessaint, Edna.
Diehl, Ida.
Dillingham, Grace.
Disch, Esther.
Donohue, Nellie C.
Dresser, Ursula.
Dresser, Grace.
Dunkel, Hilda.
Dynes, M. P.
Edwards, Grace M.
Everhard, Ethel.
Ewer, Evangeline.
Freutel, Litta M.
Fricke, Bertha.
Fricke, Clara.
Furer, Fannie.
Garchwaite, Lola.

MEMBERSHIP LIST—WOMEN—continued.

Gartmann, Louise.
Geussenhainer, Lillie.
Gibson, Mora.
Gill, Agnes.
Gillett, Mabel.
Goerlitz, Minnie.
Gorgen, Mary.
Gregorie, Jessie.
Habighorst, Alma.
Haines, Edna E.
Halvorsen, Sigma.
Hanson, Maggie.
Hensel, Alma M.
Heronymus, Mary C.
Hinske, Gertrude.
Hoehne, Eda.
Hulse, Gertrude.
Imig, Clara.
Jenson, Lillian.
Jenkins, Lauretta I.
Kaempfer, Elsie M.
Karste, Mrs. Harriet.
Kimball, Bertha B.
Laing, Anna V.
Lethe, Tillie.
Livingston, Mae.
Maloney, Margaret.
Martin, Hazel.
Martin, May.
Mayo, Myrtle.
Meier, Laura A.
Meyer, Inez.
Meyer, Julia.
Minor, May.
McBribe, Ella.
McKenna, Mary A.
Nelson, Mabel.
Olson, Lauda.
Patterson, Edna.
Panstian, Clara.
Pierce, Elitta.
Pomeroy, Clara.
Prahl, Minnie.
Prom, Helen.
Raisen, Mary.
Reinick, Lulu.
Reitmann, Olive.
Riordan, Margaret.
Schubert, Martha.
Schoenk, Tillie M.
Seideman, Cora.
Seideman, Elva.
Sonleitner, Elizabeth.
Speck, Adela.
Stokdyk, Ada N.
Striebel, Marie.
Telgener, Elva D.
Thackray, Helen.
Thomson, Janet.
Thomas, Clare.
Tibbets, Vesta.
Tontenhoofd, Nellie.
Wagner, Lilian.
Wagner, Rose.
Warner, Elizabeth.
Weeks, Agnes J.
Wichmann, Agnes.
Winkler, Mrs. Theo.
Wolf, Waula K.
Wunsch, Flora.
Varney, Edith.
Zandke, Nora.
Zufelt, Zula Z.

SHEBOYGAN FALLS.

Armstrong, Ruth.
Bishop, Leila.
Calkins, Mildred.
Groll, Myrtle.
Kendal, Coral.
Lenkel, Ellen.
Pratt, Sarah.
Raymaker, Josephine.
Schulz, Laura.
Sisson, Mildred.
Sisson, Viola.
Te Selle, H. R.
Thomas, Nellie.

SHOVIEN.

Klingbeil, Mary.

SOMERS.

De Long, Mary.

SO. GERMANTOWN.

Greulich, Elsie.
McCormack, Madge.
Mueller, Mary.
Thielman, Rose.

SOUTH KAUKAUNA.

Phillips, Rose.
Sadlier, Kate.

SOUTH MILWAUKEE.

Briengs, Theresia.
Cavanaugh, Mary H.
Conway, Katherine.
Crowe, Ella.
Dyer, Mary.
Eaton, Mary.
Eastman, Marian.
Esther, Sister.
Frodermann, Emma.
Hanrahan, Ella M.
Hughes, Florence.
Lampert, Leona D.
Marren, Anna.
McCarrier, Mary A.
Phillips, Verna A.
Porter, Birdie E.
Quentin, Ella.
Ryan, Nora.
Satourell, Ruth.
Trabne, W. Elsie.
Verena, Sister.
Weisand, Elizabeth.
Wilhelm, Alice.
Zilg, Eulalie.

SOUTH WAYNE.

Stuart, Beatrice.

SPRING GREEN.

Cronin, Clara M.
Norris, Patricia.
Schloesser, Irene.

STEVENS POINT.

Burce, Lulu A.
Clifford, Margaret.
Collins, Clara.
Collins, Mary.
Dunegan, Mary.
Fuller, May.
Gilbertson, Carrie.
Glennon, Margaret.
Hippinsteel, H. S.
McMulkin, Nellie.
MacNees, Ellen.
Scott, Louise.
Scott, Ethel.
Smith, E. T.
Spindler, Winifred H.
Studley, Flora C.
Welch, Kate E.
Williams, Martha E.

STOUGHTON.

Ames, Mamie.
Anderson, Ella B.
Asperheim, Hattie.
Barber, Ellen.
Bowen, Laura E.
Campbell, Susan.
Clark, Georgiana.
Coleman, Bessie.
Creighton, Margurite.
Erb, Elizabeth.
Ernson, Julia.
Field, Alice.
Field, Nettie.
Gilbertson, Minnie.
Haugen, Constance.
Henderson, Leonora.
Howell, Mattie.
Lothe, Ada.
Lund, Lela.
Mason, Estella.
Medtbon, Gilda.
Melaas, Alva.
Mikkelson, Eleanor.
McLaughlin, Ethel.
Nelson, Annette.
Olson, Clara.
Parish, Edith.
Parent, Elizabeth.
Pells, Winifred.
Pinkerton, Carrie.
Rosendahl, Lydia.
Schauland, Maty.
Schrode, Clara.
Serles, Julie.
Seston, Alma.
Smith, Grace.
Solien, Marie.

STOCKBRIDGE.

Fitzgerald, Kate.
Kenney, Mabel.
Kenney, Stasia.

STURGEON BAY.

Clark, Alida E.
Ellison, Anna.
Lawrence, Clara.

MEMBERSHIP LIST—WOMEN—continued.

Marshek, Mary.
Minor, Maude.

SULLIVAN.

Brewin, Tina.
McGinnis, Frances.

SUN PRAIRIE.

Bakinbine, Evva.
Beneath, Mayme.
Brusso, Lena.
Churchill, Ethel.
Cook, E. M.
Dumphy, Margaret.
Heinz, Mary.
Koek, Edna.
Schuster, Josephine.
Slatter, Frances.
Toynton, Bessie Maud.

SUPERIOR.

Barbour, Caroline.
Best, Maude E.
Berry, Agnes E.
Blood, Emma B.
Cowie, Mabel.
Cox, Erminia.
Dohls, Elvene J.
George, Gladys.
Gerald, Helen Fitz.
Geringer, Gertrude.
Gunn, Alice M.
Farrell, Elizabeth.
Holzberg, Elsie.
Howson, Mabel.
Isaacson, Emma.
Lloyd, Jones Mary R.
Kinne, Ella.
Lakrison, Nellie.
Larson, Olga.
Larason, Eloa E.
McCarrier, Mary A.
Moylan, Catherine.
Norten, Susan.
Robbins, Jane W.
Rowland, Elizabeth.
Schlegel, Katherine.
Swanson, Emma.
Sweetnam, Ina.
Swift, Mrs. Diana.
St. John, Bessie E.
Squire, Carrie R.
Wood, Florence.

SUSSEX.

Boots, Pearl.
Kaderabek, Lillia.

TAYLOR.

Hanson, Josephine.

THERESA.

Gardien, E.

TIGERTON.

Phillips, Evelyn.
Schuh, Sue M.

TIMOTHY.

Finch, Alice.
Finch, Melvina.

TOMAH.

Bolton, Grace.
Church, M. O.
Lavin, Mary.
Wood, Minnie.

TOMAHAWK.

Hanson, Sena V.
Means, M. Clara.
Nason, Irma M.
Olseon, M.

THIENSVILLE.

Hilger, Hattie.
Linden, Eliz.

TROY CENTER.

Broker, Leila.
Broker, Rena.
Fitzmorris, Veronica.
Fitzmorris, Frances.
Goodman, Esther.
Murphy, Elizabeth.

TWO RIVERS.

Baker, Mary.
Chloupek, Olga.
Faulkes, Della.
Franz, Louise.
Hamilton, Mrs. W. J.
Johnson, Harriet.
Kickhoefer, Amanda.
Nespor, Ladonia.
Peterson, Eleanor.
Thursby, Claire.
Truckenbrodt, Lina.
Schroeder, Anna.
Shafer, Edna.
Shafer, Maude.
Winn, Bertha.

UNION GROVE.

Bosma, Ida.
Boulden, Etta.
Dixon, Maud.
Forward, Myrtle.
Goldworthy, Lois.
Larson, Amy.
Manchester, L. E.
Osinge, Nellis.
Sears, Laura.
Suantz, Isabel.
Shunk, Florence.
Smith, Lois.

UTTER'S CORNERS.

Zuill, Frances.

VERONA.

Luech, Clara.
Leuch, Nellie.
Nadler, Carrie.
Shuman, Laura.

VIENNA.

Esse, Ingabore.
Swalen, Rhoda.

VIROQUA.

Baker, Alice.
Goddell, Kate.
Moore, Florence.
Nazum, Ethel.

WALDO.

Petersen, Ottilie M.
Singleton, Helen F.
Smith, Anna.

WARRENS.

Bullard, Ava.
Peterson, Olga.

WATERFORD.

Anderson, Anna.
Burns, Elizabeth.
Glueck, Linda.
Jacobson, Grace.
Krause, Anne.
Morse, Olive.
McNamara, Mayme J.
O'Keefe, Mary.

WATERLOO.

Currie, Alice.
Doering, Irene.
Doyle, Nellie C.
Hogel, Ella.
Jamich, Emma.
Joice, Emily.
Lange, Emma.
Lauger, Emma.
Mackenzie, Viola.
Parker, Cecil.
Rickerman, Lenora.
Stokes, Nellie.
Withers, Harriet.

WATERTOWN.

Barganz, Ida.
Brasky, Catherine.
Buede, Elsie.
Crangill, Mary.
Donovan, Margaret.
Freber, Minnie.
Gesley, Gertrude O.
Giblin, Mary.
Goecke, Anna.
Gnewuch, Hilda.
Habhegger, Lillian.
Halland, Anna.
Huber, Myrtle.
Huber, Laura.
Jarger, Louise.
Killian, Marie.
Kirchoff, Alma.
Koehler, Sophia.
Kopp, Ida.
Kopp, Alvira.

MEMBERSHIP LIST—WOMEN—continued.

Krebs, Teckla.
Moran, Matie.
O'Connor, Margaret.
Owen, Julia.
Pomeroy, Lilla.
Powers, Ella.
Ryan, Catherine.
Seidel, Emma.
Sipp, Ella.
Stacy, Mamie.
Steinmann, Leona.
Voelty, L. Martha.
Voss, Edna.
Weise, Mary.
Wilder, E.
Wittchow, Emma.
Youngquist, Anna.

WAUKON, IOWA.

Black, Edna.
Slater, Ella.
Thomas, Maud.

WAUKESHA.

Allen, Abby.
Allen, Genivieve.
Allen, Inez.
Allen, Jennie.
Atkins, Mabel.
Barnes, Laura.
Beardsley, Ruth.
Berry, Ada.
Bidwell, Emily.
Bidwell, Ida.
Blakeslee, Lella.
Bonault, Justine M.
Bonney, Elizabeth.
Campbell, Grace.
Carpenter, Vera.
Colloton, Catherine.
Connell, Carrie C.
Converse, Daisy.
Dickie, Sarah.
Edgarton, Cordelia.
Esterly, Florence L.
Flattery, A. M.
Gordon, Frances.
Gordon, Mrs. R. I.
Graf, Lillie.
Granger, Ida M.
Gutzman, Freda.
Hale, Floy C.
Harrigan, Margaret.
Hayford, Mildred.
Hunt, Mabel.
Hutton, Mrs. A. J.
Jones, Margaret J.
Kaul, Myrtle.
Lean, Inez.
Luke, Maude.
Malia, Marie.
Morrow, Winifred.
McNaughton, Clara.
Meurz, Clara.
McCabe, Amber.
McCorkle, Bell.
Neubecker, Phoebe.
Orth, Louise.
Peacock, Miss.
Phillips, Myrtle.
Reudig, Ella.
Rhoads, Mrs. G. B.
Roemer, Emma.
Ryan, Margaret E.
Schutte, Esther.
Schneider, Ada.
Sleep, Mabel.
Sprague, Alice E.
Stanton, M.
Tenner, Elanore.
Thayer, Eva M.
Whitney, Ella.
Williams, Mary S.

WAUNAKEE.

Bewick, Mary.
Hebenstreit, Jane J.
McQuire, Kathryn.
Thomas, Lottie.
Shipke, Edith.

WAUPUN.

Carpenter, Maud.
Clark, Mary.
Dalton, Eunice.
Davis, Charlotte.
Glover, Edith.
Heath, Marion.
Holmer, Elma.
Moul, Edith.
Osborn, Grace.
Purcell, Clara.
Rhodes, Marion.
Robinson, Nora.
Schnaase, Augusta.
Sloan, Mary.
Winter, Margery.

WAUPACA.

Bates, Maude.
Buerstatte, Juniatta.
Chamberlain, Marie T.
Gamble, Estella.
Gamble, Mrs. William.
Ham, Euphemia.
Harmon, Jessie.
Harrington, Alice G.
Heaney, Genevieve.
Kudsen, Lillian.
Linkfield, Hazel.
Miller, Mabel G.
Pope, Amelia.
Rasmussen, Allie N.
Roberts, Gladys.
Stevens, Elizabeth.
Stewart, Gertrude.
Stinchfield, Winnifred.
Teuton, Hazel A.

WAUTOMA.

Christman, Anna E.

WAUWATOSA.

Adams, Florence B.
Barnard, Margaret.
Bleedorn, Bertha.
Blodgett, Isabell C.
Bluteau, Edwardina.
Canright, Blanche.
Chamberlain, Miss.
Copeland, Anna.
Davis, Bertha.
Deibler, Betta.
Dreutzer, Ruth A.
Everett, Daisy K.
Gillett, Elsie.
Haugan, Alice J.
Hunter, Gertrude.
Israel, Rose.
Johnson, Henrietta.
Kappelman, Mary.
Klogner, Emily C.
Krueger, Camilla.
Lefever, Florence.
McBeath, Faye.
McCord, May.
Nichols, Verna.
Nickerson, Frances W.
Payne, Iris.
Powell, Leda.
Trost, Pauline.
Webster, Zola.
Wood, Catherine.
Van Antweap, Fidelia.
Zenk, Martha.

WAUSAU.

Bessey, Lois.
Binnewies, Julia.
Bohrer, Rosalia.
Carter, Winnie.
Climbuck, Emily.
Colby, Alta.
Culbetson, Mertie.
Dale, Susan.
Drew, Pearl.
Golisch, Clara.
Hamacker, Edith.
Hopp, Wanda.
Hudtloff, Christiana.
Jenkins, Anna.
Kerr, Margaret E.
Laumer, Alma.
Laumer, Eda.
Laughlin, Mary.
Lillie, Myrtle.
Lillie, Myrtle.
Loveland, Martha.
Marson, Mary.
Opdahl, Karen.
Peterson, Gunda.
Radant, Valentine.
Rankin, Anne C.
Richards, Estelle.
Shatto, Bonita.
Schubring, Helen.
Schultz, Emma.
Slaymaker, Jean.
Sustins, Mabel.
Tripp, Fannie.
Vincent, Mabel.
Vosberg, Leora.

WAUZEKA.

Vaughan, Ethel.

WEST ALLIS.

Ababy, Elizabeth.
Assel, Mabel E.
Aubry, M.
Aubry, C.
Barnes, Maud.

MEMBERSHIP LIST—WOMEN—continued.

Boss, Lorena.
Brook, Adahue.
Carr, Madeline.
Carr, Katherine.
Crossdaile, Nellie M.
Dowie, Bessie M.
Fessenden, Maude.
Foots, Hattie.
Hames, Cecilia.
Harrington, Alice G.
Jones, Mrs. F. J.
Juneau, Maud.
Kelly, B. Ellen.
McKowen, Ida.
McMahon, Mary.
McMahon, Mattie.
Paull, Mary.
Rogers, Elizabeth.
Rust, Lilia.

WESTBORO.

Mauseth, Geneva.

WEST BEND.

Dunham, Elizabeth.
Gossel, Anna.
Grebe, Ricka H.
Henry, Mrs. C. C.
Koelle, Minnie.
Knapp, Roxa.
Liebig, Pauline.
Liebig, Louise.
MacArthur, Isabella.
McLane, Mrs. D. E.
Mooers, Marion.
Mueller, Barbara.
Mumm, Edna.
O'Connell, Margaret.
Pick, D.
Schmidt, Mary A.
Weller, Marie.
Wilke, Eda M.
Woodford, Lola.

WEST DE PERE.

Chichesrer, Emily.
Greene, Eunice.
Lewis, Agnes.

WESTFIELD.

Hafroos, Selm.
Kressig, Lizzie.
Retelstorf, Caroline D.

WEST PLAINFIELD.

Wolf, Kathryn.
Wolf, Agnes.

WEYAUWEGA.

Borham, Harriet.
Chafin, Helen.
Foote, Lois E.
Hayward, Ida.
Kuester, Clara T.
Singer, Emma.

WHITEFISH BAY.

Carncross, Alice A.

WHITELAW.

Laughlin, Elizabeth.

WHITEWATER.

Agnew, Jane.
Baker, Lucy A.
Bradford, Mrs. M. D.
Brunstadt, Margaret.
Carey, Edith.
Chapman, Mrs. E. W.
Coucklin, Esther.
Cook, Annie L.
Cottrell, Annie M.
Dahlin, Emma.
Damuth, Libbie.
Devlin, Sarah R.
De Wolf, Mae.
Fay, Leota.
Fay, Susie.
Goodrich, Helen.
Greeley, Margaret.
Hall, Marion.
Hallowes, Clara.
Kay, May Isabel.
Kuhnhenn, Amelia.
Lan, H. Katharine.
Marr, Bessie.
Mills, Evelyn.
Mumen, Teresa.
McCutchan, Mary L.
McManus, Josephine.
Peacock, Tella.
Potter, Grace R.
Reed, Addo.
Richmond, Roxa.
Ryan, Anna.
Sayles, Nettie C.
Selverson, Olga.
Sherrill, Jennie B.
Stair, Faith.
Walbridge, Eunice.
Wood, Charlotte R.
Yeakle, Juliet V.

WILLIAMS BAY.

Holthofl, Ray.

WINNECONNE.

Bishop, Hazel.
Henningsen, Valborg R.
Hyde, Marion J.
Kueller, Ella.
Lowther, Lottie.
Moran, Nellie.
Richardson, Clara.

WONEWOC.

Ketcham, Alice.
McGuine, Margaret.
Minch, Miss.

WOSTBURG.

Murphy, Marie K.

WYOCENA.

Collinge, R.
Hart, Frances.
Stroud, Lena.

Number of women	4,067
Number of men	885
Total	4,952

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EIGHTH BIENNIAL REPORT

OF THE

FREE LIBRARY COMMISSION

OF WISCONSIN

1909-10

Published by Authority of Law

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1911

Wisconsin Free Library Commission

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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:

MRS. CHARLES S. MORRIS, Berlin.

W. H. HATTON, New London.

Officers:

REUBEN GOLD THWAITES, *Vice-Chairman.*

MATTHEW S. DUDGEON, *Secretary.*

MADISON, July 1, 1910.

To Hon. JAMES O. DAVIDSON, *Governor:*

SIR:—I have the honor to transmit, herewith, the eighth biennial report (1909–10) of the Wisconsin Free Library Commission, in accordance with the provisions of section 383a, of the Wisconsin Statutes of 1898.

Very respectfully,

REUBEN GOLD THWAITES,
Vice-Chairman.

WISCONSIN FREE LIBRARY COMMISSION

I

SECRETARY'S REPORT

One of the most important events of the biennial period for which this is the report, is the serious loss which the commission suffered in the resignation of its secretary, Mr. Henry E. Legler, who left the commission in October, 1909, to become librarian of the Chicago public library. Pride in the signal success which has attended him in his new position has tended to reconcile the friends of the commission to this irreparable loss.

Possibly Mr. Legler's most definite achievement as secretary of the commission was the gathering together of the staff which the commission had when he left, and the establishment of a system so efficient in its operation as the one which he left behind him. The present secretary feels that he should officially acknowledge his appreciation of the spirit in which the entire staff of the commission greeted him and entered into cooperation with him. Under the circumstances, such exceptional loyalty and cooperation could come only from a staff so exceptional in its characteristics as the commission staff has proved to be. The entire staff has continued to render most faithful and efficient service and many of its members merit personal mention.

Two years ago my predecessor, in making his report for the biennial period ending June 30, 1908, said: "The close of this biennial period brings to a close as well the period of library building in Wisconsin. * * * 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. * * * We must look forward now to the period of perfecting, developing, spiritualizing." The prophecy here made of the character of the work to be done has been fulfilled. The situation does not seem now to justify the commission

in emphasizing so much as in former years the work of establishing new libraries. There are comparatively few communities in the state of Wisconsin without a library which are able to support one. It is a questionable policy to pursuade a community to start a library before the proper financial ability to support it coexists with a general community sentiment in favor of it.

The work of the library commission has recently been therefore to strengthen and vitalize existing libraries, rather than to found new libraries. Given so many established libraries, it has been the primary ambition of the commission during the last biennial period to enable every library in the state to reach a stage of development in which it may be able "to furnish the best reading to the greatest number at the least cost."

FIELD WORK

The commission believes that in doing this, nothing can be of so much effectiveness as the personal efforts of the staff in the field. In performing this field work the commission has always placed the needs of the libraries in the smaller communities first, believing that the libraries in the larger cities in the state are better able to care for themselves. They have more adequate appropriations, employ more and better trained help, and have therefore less need of close supervision from the commission. It will be found in reviewing the work, however, that the libraries in the large communities have been by no means ignored.

During the year ending June 30, 1909, the members of the staff made 162 visits to 108 libraries. During the year ending June 30, 1910, they made 217 visits to 156 libraries. Of the 182 libraries in the regular visiting list, only twenty-six were not visited during the last fiscal year. Of these twenty-six, seventeen are more properly traveling library stations, so that only nine of the libraries proper have remained unvisited during the year.

These figures do not include many visits made by the Chief of the Traveling Library department to traveling library stations and to some of the smaller libraries. Nor do they include her many appearances at farmers' institutes, club meetings and other gatherings, to which she goes to further general library interests as well

as those of the traveling library. Her work in aid of new library building projects has been of special value. Neither do these figures include the numerous calls made by the secretary upon various librarians and library boards for various special purposes. The secretary and members of the staff have also appeared in many educational meetings and library meetings throughout the state.

It must be borne in mind also that the work done by the students of the library school during February and March of each year is of great value to the libraries of the state and is an important part of the field work of the commission. During the year ending June 30, 1909, nineteen students sent out for this apprentice work gave their services without compensation in fifteen different libraries of the state. The technical work done by them during the year aggregated a total of thirty-eight months, or more than the equivalent of the entire time of three skilled workers for the entire year. During the year ending June 30, 1910, twenty-six students sent out for this apprentice work gave services in twenty-three different libraries. The technical work done by them during the year aggregated a total of fifty-two months, or more than the equivalent of the entire time of four skilled workers for the full year. Thus the Wisconsin commission has been enabled to do more for the libraries of the state than does the commission of any other state.

During February and March, 1909, the students of the library school, under the supervision of the instructional staff and the librarians of the local libraries, were engaged in the following work: Making a card catalogue for the public library of Elroy; assisting in making the catalogues of the public libraries at Fond du Lac, Green Bay, Reedsburg, Racine and at the Stout Institute at Menomonie; giving special help during the busy months of February and March in the libraries at Antigo and Ashland; four students rendered general assistance at the public library of Madison, two for each month; two students rendered general assistance at Watertown and two at Rhinelander, one at Portage and one at Neenah. At Wausau the librarian having resigned on account of ill health, a student was sent to serve as acting librarian during February and March, while the

board was seeking to fill the vacancy. Her work was so satisfactory that she was engaged to return as permanent librarian upon her graduation the following June. At Appleton, special assistance was needed because of leave of absence granted to the librarian. A student was appointed to the library for each month and was able to render valuable service in the special need.

During February and March, 1910, the students of the library school, under the supervision of the instructional staff and the librarians of the local libraries, were engaged in the following work: Continuing assistance in the cataloguing of the libraries at Fond du Lac, Green Bay and Racine; assisting and revising the catalogues at Merrill and Janesville; in re-organizing and cataloguing the library at New London; in organizing libraries at Oregon and Tomahawk; assisting in cataloguing the children's books in the library at Ashland; special work at Sturgeon Bay and Wauwatosa. The assignments were made for general assistance as follows: One student to Antigo, Baraboo, Kenosha, Manitowoc, Marinette, Stout Institute (Menomonie), Menomonie, and Wausau for a month each; two students to Madison, Marshfield and Watertown; two students in the joint course to the Legislative Reference Library, Madison, and four students in the joint course to the Madison free library. A student was also sent to take charge of the library at Whitewater during a two months' absence of the librarian at that place.

CO-OPERATION BETWEEN COMMISSION AND LIBRARY SCHOOL

The Wisconsin Library School is unique among library schools in that it is the only one maintained by a library commission. The commission is unique in that it is the only one maintaining a library school. The advantages are mutual.

The libraries of the state have profited since they have been aided not only by the commission workers but by the instructional staff of the school and have had at their disposal the services of a considerable number of students fresh from technical training. No other commission has been able to give to the libraries of its state anything like the amount of time that has been given to the libraries of our state under this arrangement. The Wisconsin Commission gives assistance which would be impossible without the school.

A CHRISTMAS ENTERTAINMENT IN THE SOUTH SIDE MILWAUKEE BRANCH.

Secretary's Report.

The instructional staff of the school has constituted an advisory and consulting board and has been appealed to again and again to meet difficulties arising in the state. The correspondence carried on by the staff with the libraries of the state has also been of great value. Frequently, too, the students under supervision of the staff have prepared and sent out to the libraries of the state valuable material of various kinds.

This cooperation between school and commission has been of great value to the libraries of the state, and the doing of the work has been most excellent practical experience for the students. Then too, the fact that the members of the instructional staff constantly travel through the state visiting libraries, large and small, come in close contact with actual library conditions, and keep in touch with the practical problems of the library world, gives to their instructional work a vitality, a soundness and a practical value that it might not otherwise possess.

The librarians of the state are invited and encouraged to visit the school, inspect its equipment, and attend its lectures. During the two years, fully seventy-five trustees and librarians have responded to the invitation, remaining from a few hours to a week. These calls serve to continue the pleasant and profitable relations established between the libraries and the commission, and show the cordial spirit in which the work of the instructional department is received in the libraries of the state.

VISITATION

It is the aim of the department to visit every free library of the state once every year, and from the report of the visits of the year just closed, it is seen that during the last year this has been more nearly attained than ever before. The visits vary in length from a few hours to a week. Probably the length of the average visit is two days. If a library is being organized or reorganized, or for some other reason is in need of special help, more than one visit is made during the year. Occasionally as many as five visits are made to an individual library during a year, and two visits a year are frequent, if the need is sufficient. When a long period of help is needed, the students are called upon in their apprentice period and when the need is great two students sometimes work for two full months in the same library.

Secretary's Report.

The sort of problems which local librarians bring to the field workers for solution is suggested by the following examples recently arising: inquiries as to the binding and mending of books, the keeping of records of various kinds, the binding of periodicals, the binding of current numbers of magazines, the opening of children's rooms in the evening, the collection of fines, and the fumigation of books. Questions also arise as to rent collections, picture collections, periodical indexes, the disposition of damaged books, and lists of periodicals to be taken. Problems of pure library technique present themselves frequently, as do questions concerning the shelf list, the catalogue with its many intricacies of subject headings, cross references, alphabeting, Library of Congress cards, etc. Advice upon book selection is also often sought and given.

So far as is possible, it is the policy of the department to divide the field among the members of the staff, assigning to each a certain number of libraries which she is to visit from year to year, and with which she is to keep in touch by correspondence and otherwise. By this means a continuous policy for the development of a library can be carried out. A report is presented for every visit made, covering the general condition of the library, the work done by the visitor, and the recommendations made for future work to be undertaken. These reports are filed and are constantly used by the staff. The reports are of especial value when for any reason a change of visitor is made, as the new visitor having at hand the history of the library can easily take up and carry forward the work. We consider these reports on the different libraries of great value.

THE FINANCIAL NEEDS OF LIBRARIES

It is of course a fact that in practically every city in the state the greatest obstacle to successful library work is lack of funds. Back of this financial difficulty, however, is the principle which must not be ignored, that no library will succeed which does not serve the community. The first impulse of the ambitious librarian is to get more money so as to be able to do big things for the city. The process must be reversed. The library must do big things for the community in order that the community may be ready to give more money to the library.

The library must reach all classes. It must furnish recreative reading for those with leisure, information for the studious, and must be of utilitarian and financial service to those interested in civic and municipal problems. The public men of the community will not be interested in the public library which has not interested itself in the affairs in which the community is interested. If in working for an increased appropriation the librarian finds that the men of affairs in the community take little interest in the library, the librarian must ask herself the question whether or not this condition does not arise because she has taken too little interest both in the public affairs and in the men of affairs. The commission believes and advises that it is up to the librarian to inquire of herself what she has done during the year to help the men to whom she now goes for help. What activity has she engaged in which appeals to and helps the intelligent men of the community engaged in professional work, in politics, in civic improvement, in municipal administration and finance. If the librarian has made her library an instrument to help the city in its improvements and progress, if she has made the progressive and conscientious city official feel that one of the aims and achievements of the library is to aid in civic enterprises, she will find that her claims for consideration in the matter of appropriation will have champions who are in a position to do real service.

The principle is a broad one. Every successful effort to serve the community creates champions ready to help in getting increased appropriations. If the school children, for example, are brought to the library and there aided in their school work, their parents will know it. Success with children means success in the eyes of the parents, and the chances are that among these parents will be found city officials and others in a position to be of great assistance.

COOPERATION WITH SCHOOLS AND WORK WITH CHILDREN

Among the phases of library work upon which the commission is now laying special emphasis is that of the cooperation of the library with the schools of the community. It is the policy of the state, as evidenced by the statutes, that the library should be closely related to the school system of the state. The state sup-

erintendent of public instruction is a member of the state library commission; the superintendent of schools of every city is a member *ex officio* of the library board; under the law requiring the expenditure of certain sums for the purpose, there is a school library in nearly every schoolhouse; the law also requires those applying for second grade teachers' certificates to have a knowledge of the cataloguing of libraries.

The commission, apart from its keen appreciation of the value of the work with the schools, has therefore deemed it its duty to carry out the spirit of this statutory policy. It is everywhere strongly urging the closest working relationship between the librarian and the teacher. In many cities classes are sent in school hours to the public library, there to learn the use of books, and the resources of the library. The library work is considered a school duty, and credit is given for work done there. It is found necessary in other places for the librarian to visit the schools in order to reach the pupils, although experience indicates that the ideal method is for the classes to come to the library. In all of the larger places, also, groups of books including such as are particularly useful to the pupils are sent to the school room to be left for a considerable period of time and circulated under the direction of the teacher.

Members of the commission staff have prepared outlines for the work with the schools and for instruction to be given to the public school pupils with reference to the resources of the library, and have sought in every way possible to induce the librarian and the teacher to cooperate in the work. The staff have also visited a number of educational meetings to urge upon teachers, by addresses and by personal suggestion, the value of this cooperation from the educational standpoint.

The first and most direct result of this cooperation is that the pupil is benefited in his school work, since the riches of the library splendidly supplement the necessary narrowness of the text book. The second and more indirect result is, after all, more important. In the library the pupil has learned the resources of literature, he has acquired a taste for reading, a taste in reading. If he has once enjoyed this companionship of books, he will continue to be a patron of the library long after the doors of the public school

LIBRARIAN McKILLOP AND HIS YOUNG LIBRARY PATRONS OF THE SOUTH SIDE, MILWAUKEE.

are closed to him. The library will become his continuation school. He is in a fair way to become an educated person, even though he never again enters the school room.

The time has come when no librarian is considered professionally efficient who does not persistently and systematically seek to cooperate with the schools. The interest of the child, we think, demands that a standard shall be established under which no teacher shall be considered professionally efficient who does not appreciate that she must make her every pupil familiar with the library; under which no teacher will care or dare to fail to open to the pupil the library door that leads to all the resources and riches, the pleasures and profit that come from familiar companionship with books.

Not only do the libraries of the state cooperate with the schools, but they seek in every way possible to interest the younger generation in the library and in good reading. In many libraries the children are brought to the library for a story telling hour. Every story is told upon the theory that it will lead to the reading of some good book. The curiosity of the child who has heard a story from one of the children's classics is aroused, and he is led to read the classic itself. With this same principle in mind the libraries in one or two cities in the state are making use of the moving picture. In one case the librarian told to a large audience of school children gathered in the library auditorium a simple version of *Launcelot and Elaine*, explaining that the pictures soon to be given would illustrate the story told and that the story, as well as others of a similar nature, could be found at the loan desk in the children's room. Then for twenty minutes the moving pictures upon the screen retold the story, the background of scenery and the costuming of characters being in perfect harmony with the spirit of the theme. Then the librarian outlined the story of *Oliver Twist*, explaining who the auther was, what the book was, and that the book, as well as other books by the same author could be obtained in the library. Then for twenty minutes this story was also told in moving pictures upon the screen. These stories, told orally and pictorially, necessarily interested every child in these two pieces of literature. Should the effects of this hour in the library mean nothing more than a

clear conception of these two, it would be worth while. It was found, however, that many who saw the pictures went to the desk later to learn more of the stories told and to learn of others similar to them.

THE LIBRARY AS A SOCIAL FORCE

It seems to be an economically sound principle that the public library building should be not only a place for storing and distributing reading matter but also a meeting place for study clubs, women's clubs, commercial clubs, and debating clubs of the community, and that it should contain a general auditorium for lectures and other meetings of an educational character. Unless the library building is used for these purposes, there is in many communities no place available for such uses. The economy resulting from placing these all under one roof where they can be heated by one heating plant, cared for by one janitor, and supervised by one custodian, is evident. Most of the libraries of the state have, therefore, besides the room used for general library purposes, an auditorium and other smaller club rooms. The librarians of the state are assisting in special reference work for debating clubs, study clubs and commercial clubs, and are taking an active interest in civic improvement leagues. They arrange for exhibitions and receptions in order to bring the people of the community to the library building and make its possibilities known to all. The libraries of the state cooperate in every way possible with the local and state boards of health, and have proved to be efficient distributing points for the literature issued by the anti-tuberculosis association.

From a library's standpoint, the commission has felt that centering all these activities in the library building has a tendency to make of all the persons attending these meetings library patrons. It has a tendency to bring those who would be interested in good reading matter into touch with the good reading matter kept in the library. Whenever any group of persons are brought to the library, whatever the occasion and whatever the subject under consideration, the librarians are urged to have at hand a collection of books bearing upon the subject and suitable to the needs of the persons present. The librarian is never to lose sight of the fact

READING ROOM IN LIBRARY OF MILWAUKEE STATE NORMAL.

that her main function is, after all, to place the right book in the hands of the right person. All other considerations are secondary to this.

The visitors from the commission have frequently suggested these various fields of community helpfulness and have often been present personally to insure success in carrying out the suggestions. In some cases some special efforts along these lines have immediately resulted in increased appropriation.

MEN'S READING ROOMS

Sociological investigators maintain that it is social instinct rather than thirst which takes the unattached man into the saloon and other places of questionable influence. It is often true that the workingman, without a home, has no place to which he can go for an hour of reading and smoking and unrestricted association with other men. The commission has taken the position that a men's reading room so conducted as to be a smoking room and a club room as well meets a definite need. The tables should be filled with daily papers, attractive comic and illustrated weeklies, popular monthlies, and periodicals of a technical character. Many cities have instituted such reading rooms, and while they are not patronized as much as they should be, they are to some extent meeting this demand.

MUNICIPAL REFERENCE

Somewhat related to the use of the library as a social center is the work of meeting the need that exists in every community for the latest and best literature bearing upon civic subjects. The commission is urging the libraries of the state to recognize in their collection and handling of material the need of the city officials and others interested in municipal government. Much is being printed relating to the problems of the city, and this should be collected and made easily accessible to official and citizen. Possibly no other line of library work is more directly beneficial to the community in a utilitarian sense or shows results more quickly than this municipal reference work. If the library can demonstrate that those struggling with the practical city problems can be helped in the library, the librarian will not lack friends. If she

can deliver to the city attorney, worried over a proposed franchise, Wilcox on Municipal Franchises with the assurance that it is the last word on the subject; if the mayor, seeking to settle paving problems is given comparative data out of the experience of other cities; if the aldermen know that in the city library they can find valuable material on sewerage, street lighting, municipal water works, and other subjects of interest to them; if the city officials have such experiences with the library, they will need no argument to convince them that the library must be fairly dealt with in matter of appropriation.

OTHER PHASES OF COMMISSION WORK

Some of the work of the commission can be only briefly referred to.

Cooperation with University Extension. The commission has inaugurated during the past year special cooperation with the extension department of the University of Wisconsin, having loaned to the extension department study groups, the extension department in turn placing these at the disposal of their students. In no way can the books of the commission be put to a more extensive and intensive use, and it is recommended that this work be continued. The University Extension is in many ways working along lines that parallel those of this commission, and the heartiest cooperation is recommended.

Publications. The bimonthly publication of the Wisconsin Library Bulletin has been continued, and from reports received from various places, it continues to be of great value to the libraries of the state. Some special articles prepared by different members of the staff have proved of great value to the libraries in meeting their practical problems. The value of the publication is evidenced by a considerable subscription list from outside of the state, and by demand for extra copies when special articles are inserted.

In May, 1909, a pamphlet of 122 pages entitled "Anniversaries and Holidays, references and suggestions for picture bulletins" compiled by Miss M. E. Hazeltine, assisted by the staff was published. Its purpose was to serve as a guide to librarians and teachers in finding material for bulletins and reading lists in

connection with the celebrations of the holidays and notable events and prominent men connected with such days. This pamphlet has been in demand not only throughout the state, but a great many requests for it have been received from beyond the state.

During the period covered by this report a new series of pamphlets on American Social Questions has been started. This series consists of short, selected bibliographies on topics of vital interest at the present time and are designed to aid debating societies and others interested in their consideration. These bibliographies are the work of students in the Library School, prepared by them in fulfillment of the graduation requirements of the school. The following have been issued: The Negro Problem, Immigration Problem, Labor Problem, Poverty, Concentrated Wealth, and Business Morals.

The Suggestive List of Children's Books, upon the revision of which the Library School faculty has been engaged for two years, will soon be ready for distribution. It is a handsomely prepared pamphlet of 104 pages. In the process of its preparation various experts have been consulted and we think it will be of special value in the selection of books for children. The work of compilation has been done by Helen T. Kennedy with assistance from the rest of the staff. The need for a new edition of the original list, issued in 1902 and long out of print, has been strongly realized.

The commission has recently published as a circular of information, "Traveling Libraries in Wisconsin, with directory of stations" compiled by Miss Lutie E. Stearns, the chief of the traveling library department.

There will be found elsewhere a complete list of the publications issued by the library commission to date.

Getting idle books into circulation. Under the contract with the American Library Association publishing board calling for the delivery to the commission of books sent to the board, the commission found itself some months since with a large number of very valuable books on its shelves, many of which were not fitted for the ordinary traveling library use.

Some of these have been placed as supplementary books in the

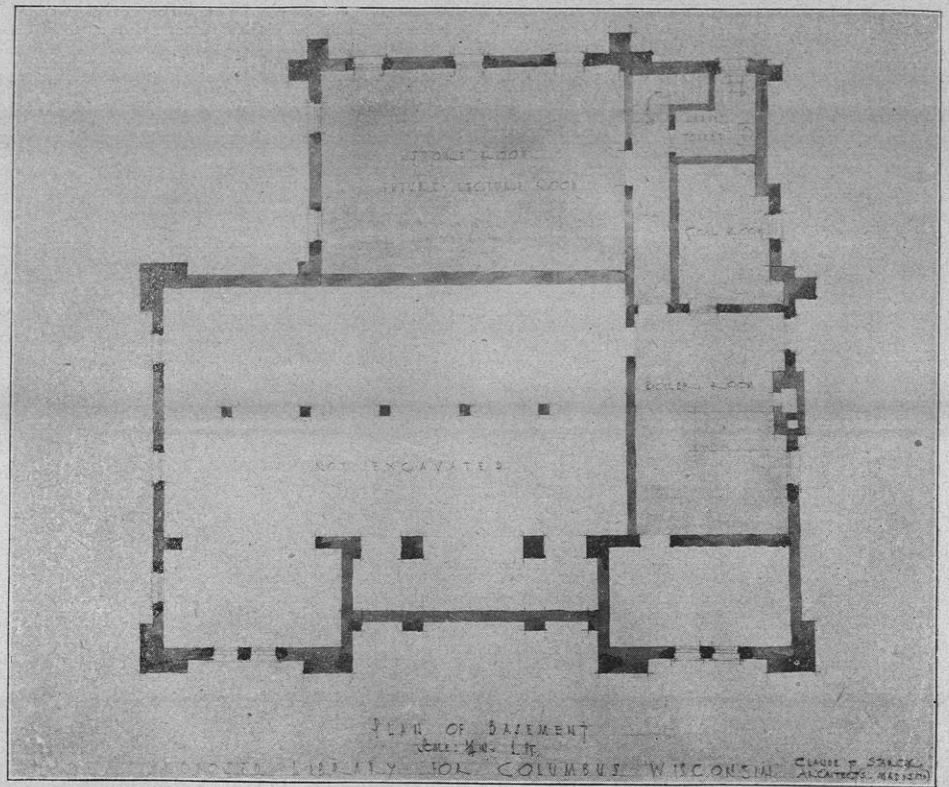
study groups. Books treating of agricultural subjects have been made up into special study groups and sent to the county agricultural institutions. Technical books suitable for the purpose have also been sent to university extension centers where technical subjects were studied. Books treating of ecclesiastical and religious subjects, the circulation of which among laymen might have been criticised, have been placed in study groups to be sent out to interdenominational groups of ministers, the commission protecting itself by the definite reservation that it in no way indorsed any sentiments expressed in the books. Some of the exceptionally attractive books have been made up into groups which have been sent for temporary use to various libraries of the state to be there advertised and featured for the purpose of attracting attention to the local library.

As a result of the distribution of these books in these different ways, the secretary is glad to report that there is now in the quarters of the commission practically no idle capital in the form of unused books.

Pictures. During the term covered by this report the circulation of the fine collection of imported prints and other pictures secured by my predecessor has been inaugurated. The presence of these pictures in various libraries has been greatly appreciated and there has been a definite demand for more collections than we have been able to furnish.

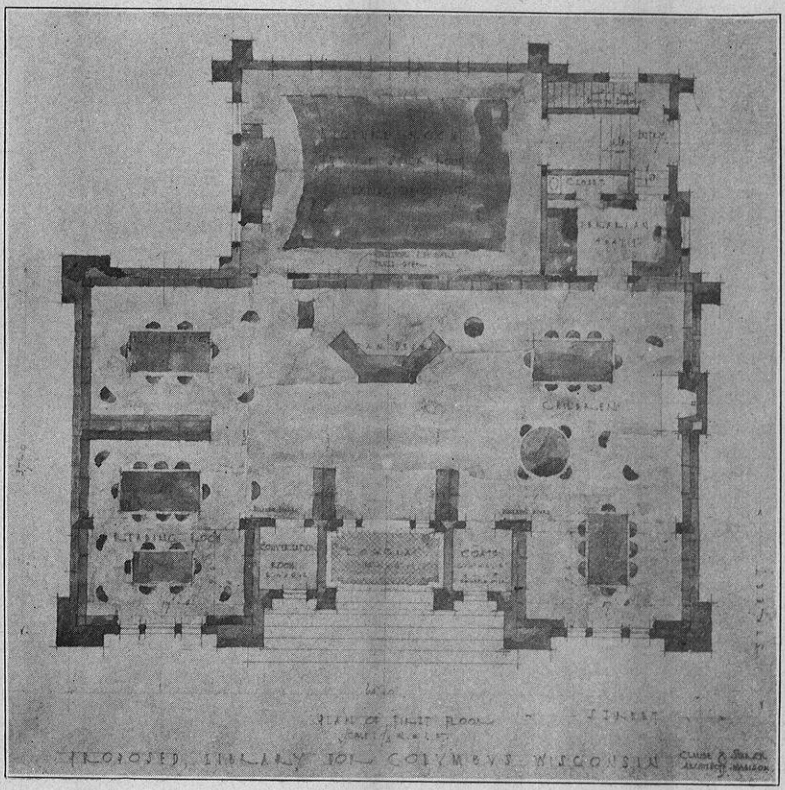
PROPOSED LIBRARY FOR COLUMBUS, WIS.

The commission has long recognized the necessity for a less formal design for a library building costing under $15,000, and it was the idea of securing greater space in libraries that Miss Stearns, of the commission, recently enlisted the interest of a firm of architects in Madison, Claude & Starck, in making a plan that would be attractive on the exterior and as large as the fund will allow on the interior. These views are the result.



PLAN OF BASEMENT
SCALE: 1/8" = 1 FT.

PUBLIC LIBRARY FOR COLUMBUS, WISCONSIN. CLAUDE F. STALEY, ARCHITECT, MADISON


PLAN OF FIRST FLOOR
PROPOSED LIBRARY FOR COLUMBUS WISCONSIN

The Library School.

II

THE LIBRARY SCHOOL

In the previous biennial report, the record of the Library School was almost entirely of its inception and early organization. The present report will show the strengthening of that organization in all departments. This period spent in perfecting the work of the opening years has been a most profitable one, for after the enthusiasm of the initial work has become the judgment of experience, a term of years is needed in which to improve and perfect the organization.

This report covers the third and fourth years of the school. The achievement of the school's progress most important to record is the successful establishment of the joint course with the University of Wisconsin just arranged for at the close of the last biennial period. In this course a student of ability and energy can, in four years, with the opportunity afforded by the summer session of the University, take the degree of bachelor of arts and at the same time complete the technical training required by the Library School. In the first two years students take the regular freshman and sophomore work of the College of Letters and Science, choosing such courses as will enable them to pass the entrance examination of the Library School. In the junior and senior years, they substitute equivalent courses in the Library School for ten unit hours of University work each year.

This arrangement was effected late in the spring of 1908, with little opportunity to give notice of the new course thus opened to University students. Two, however, presented themselves for examination in June of that year; one a junior with advanced standing, the other a sophomore. Both were admitted to the school. In June, 1909, six came up for examination, five of whom were admitted; in June, 1910, seven were examined and six admitted. The school has given its certificate to three joint course students, five will receive certificates in June 1911, and five juniors remain as seniors to graduate in 1912. A number of under classmen have

The Library School.

already planned their work for the freshman and sophomore years, with a view of taking the joint library and university course in the appointed time.

Since the joint arrangement the Library School has readjusted its entire schedule of hours for lectures, quizzes, student conferences, and practice work, to meet the schedule needs of the joint course students. Juniors spend Tuesday and Thursday at the Library School; seniors Monday, Wednesday and Friday. It was extremely gratifying to find, however, that the curriculum was sound, and that no fundamental changes were required. The graduates of the joint course are filling responsible positions, and the seniors give evidence of meeting the requirements for a good library appointment.

In the biennial report for 1907–1908 considerable space was devoted to a discussion of the curriculum of the school. This curriculum as discussed in that report has remained uuchanged in its foundations. Minor changes have been made to render it more perfect pedagogically and to balance the different courses offered by strengthening some, shortening others, by cutting out altogether the non-essential, and by correlating all more closely. When a professional course covers only one year every period of instruction must be closely scrutinized, to make sure that what it contains is absolutely essential and properly related to the other instruction.

The entrance requirements remain as they were fixed by the Commission at its annual meeting in 1906. These entrance requirements have been rigidly enforced, many poorly prepared students have been rejected, and the high standard of the school has been maintained and from year to year advanced.

The grade of scholarship attained by the students in the joint course coming to the library work after two years in the University has been so high as to demonstrate that the mental discipline of a collegiate course adds materially to the students' power of acquisition. This impels us toward the conclusion that it would be advisable to establish higher entrance requirements. It must be borne in mind, however, that academic accomplishment is in no degree a substitute for the personality test. We still regard suitable personality as a more important preliminary equipment for

library work than scholastic attainment. Unless this relative importance of personality is persistently borne in mind in considering applicants, we believe that the output of the school will distinctly deteriorate.

The field practice, which is the characterizing feature of this library school, and is being adopted in varying degrees by the older schools, has been emphasized and good has resulted to the school and to the libraries of the state.

During the field practice of 1909 (February and March) a card catalogue was made for the public library at Elroy, and much assistance was given on the catalogues of the public libraries at Fond du Lac, Green Bay, Reedsburg, and Racine; also at Stout Institute, Menomonie. At Wausau a library school student served as acting-librarian during February and March and was engaged to return as permanent librarian upon her graduation in June. At Appleton, a student appointed to the library for each month was able to give much assistance during the absence of the librarian. The libraries at Antigo and Ashland also received assistance from students. Four students were assigned to Madison, two for each month; two students each to Watertown and Rhinelander, and one each to Portage and Neenah.

The field practice for 1910 continued assistance in cataloguing to the libraries at Fond du Lac, Green Bay, and Racine, while the revision of the catalogues at Merrill and Janesville was commenced. The library of New London was reorganized and catalogued, and those of Oregon and Tomahawk organized. Assistance was given the library of Ashland in cataloguing children's books. The libraries of Sturgeon Bay and Wauwatosa received the assignment of a student to each for one month. During the absence of the librarian at Whitewater on account of ill health a student was acting librarian for two months. The other assignments were as follows; one student for a month each to Antigo, Baraboo Kenosha, Manitowoc, Marinette, Stout Institute, Menomonie and Wausau; two students for a month each to Madison, Marshfield, and Watertown. The students in the joint course were assigned necessarily to the libraries in Madison; two to the Legislative Reference Library and four to the Madison Free Library.

During the two years, thirty-eight libraries have profited by

The Library School.

the work of the students, not only in the way of actual work accomplished, but indirectly through the inspiration of contact with students fresh from their class work.

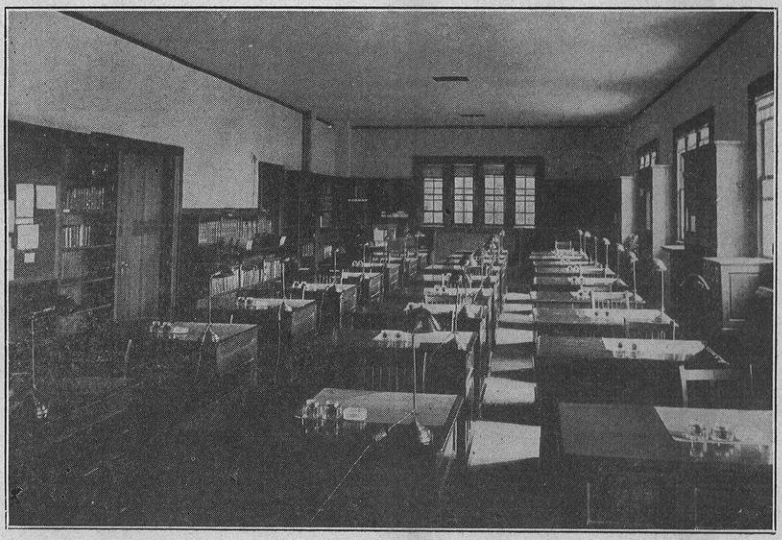
During the year ending June 30, 1909, nineteen students sent out for this apprentice work gave services in fifteen different libraries of the state. The technical work done by them during the year aggregated a total of thirty-eight months, or more that the equivalent of the entire time of three skilled workers for the entire year.

During the year ending June 30, 1910, twenty-six students sent out for this apprentice work gave services in twenty-three different libraries. The technical work done by them during the year aggregated a total of fifty-two months, or more than the equivalent of the entire time of four skilled workers for the full year. The work of the students is of course free to the libraries. Under this system the Wisconsin Commission has greatly increased its helpfulness to the libraries of the state.

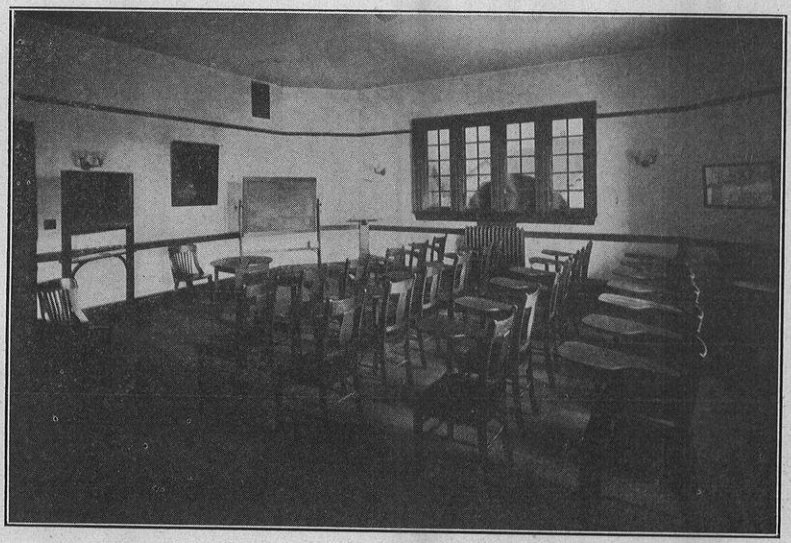
The Wisconsin Library School is unique among library schools in that it is the only one maintained by a library commission. The advantages to the school are considerable as shown elsewhere in this report. The libraries of the state have profited, since the Commission is enabled to give assistance which would be impossible without the school. This apprentice work has proved a most excellent practical experience for the students. The fact that the members of the instructional staff are constantly visiting libraries of the state, large and small, are coming in contact with actual library conditions and are keeping in touch with the practical problems of the library world, gives to the school a vitality that it might otherwise lack.

In this connection it is interesting to report that a number of librarians without the bounds of the state have made requests for student help during the field practice period, offering to pay either the Commission or the students themselves for such service. But so long as the libraries of our own state need the help of the students, we can not grant such requests, flattering as they are.

During the two years, fully seventy-five trustees and librarians of the state have visited the library school, attending lectures, inspecting the equipment, consulting with the staff, and remaining from a few hours to a week. These calls greatly advance the pleasant and



WISCONSIN LIBRARY SCHOOL, SCHOOL ROOM.



WISCONSIN LIBRARY SCHOOL, LECTURE ROOM.

profitable relations existing between the libraries and the commission, and evidence the cordial spirit present.

STUDENTS OF THE LIBRARY SCHOOL

Four classes have been graduated from the Wisconsin Library School, and the graduates number eighty-five. The report for the classes of 1907 and 1908 is contained in the Biennial Report of this Department for 1907–1908. A summary of the positions held by all of the graduates follows this section. The classes of 1909 and 1910 are the immediate concern of this report. The class of 1909 numbered nineteen, that of 1910 twenty-six; a summary shows that of the forty-five, nineteen were residents of Wisconsin; eight of Illinois; six of Iowa; three each of Michigan and Minnesota; and one each of Alabama, Indiana, Nebraska, NewYork, North Dakota and Washington state.

These graduates have all secured desirable positions at the time of graduation. In fact, many positions are secured weeks in advance of commencement.

A summary of the positions filled by these two classes at the present time follows:

Wisconsin, 14 positions filled, including four as librarians at Antigo, Wausau, Stout Institute (Menomonie, Wis.) and Marshfield; one as cataloguer at Racine, six as assistants at Superior, Madison, Sheboygan, Oshkosh and Racine, and three in Legislative Reference Library.

Other states:

Minnesota 6—Minneapolis 2, one each at St. Paul, Two Harbors, Moorhead and Mankato.

Illinois 5—Chicago 2, one each at Freeport, Maywood and Rockford.

Oregon 3—Portland 2, Pendleton 1.

North Dakota 2—Bismarck 1, Minot 1.

Ohio 2—at Cincinnati.

Missouri 2—St. Louis 1, St. Joseph 1.

Kentucky 2—Frankfort 1, Bowling Green 1.

One each in Kansas, California, Iowa, Texas, Alabama, Michigan and Washington state.

Two graduates are now at their homes.

The Library School.

SHORT COURSE

In the fall of 1907 the experiment was tried of combining with the opening weeks of the regular school a course of instruction corresponding to the work done in the summer session. The same method was followed in 1908 and in 1909. There was, therefore, no summer session proper of the library school held in either the summer of 1908 or that of 1909, but the short course was given in those years during a period beginning with the opening of the regular school year and closing at the Thanksgiving recess. The course in 1908 was attended by thirteen students, eleven from Wisconsin, one from Indiana and one from Nebraska. The course in 1909 was attended by fifteen students, thirteen from Wisconsin, one from Iowa and one from Nebraska. This arrangement had some advantages. The students taking this course got a larger view of the work and a broader library acquaintance by coming in contact with the students of the regular course, while the students of the regular course came in contact with the short course students, many of whom were experienced librarians. Then too, the staff was relieved from instructional duties during the summer months and left free to do field work.

It has been found, however, that the quarters of the school are too small to permit the carrying on of both courses at the same time. To continue this adjustment of courses would also have required the purchase of additional equipment. The instructional staff found also that the strain of carrying on both courses at the same time was considerable. Possibly the greatest objection, however, was in the fact that the librarians of the state, for whom the short course was primarily intended, often found it impossible to attend during the busy fall months, although they might be able to attend during the summer.

The commission has therefore abandoned this method of instruction and in the summer of 1910 held its regular summer school session, and will probably continue to hold summer sessions as long as the short course is needed and patronized by the librarians of the state.

MARY EMOGENE HAZELTINE,
Preceptor Wisconsin Library School.

III

LEGISLATIVE REFERENCE DEPARTMENT

The work of the Legislature for 1909 showed an increase in appreciation of the efforts of the department. For the first time also the department has been able to get men to follow up particular pieces of work. Mr. Ford MacGregor followed up municipal work. Since that time Mr MacGregor has been transferred to the University Extension Division and a new department of Municipal Reference work has been started in connection with that institution. This department has taken up to a large extent the work of furnishing material and of answering questions from the cities of the state. It has worked in close connection with our department and will be of increasing service, I believe, as time goes on.

It seems well that the department should have other specialties of this general nature as time goes on. It is of the greatest benefit to the legislature and to the state.

During the session this department was called upon to do the indexing of the session laws. Miss Scott worked out a system for that and did the work. When it will be remembered that in previous years this work has cost sometimes $700, the doing of this work by this department has been a decided saving to the state of at least that amount of money. The index made by Miss Scott has been universally approved. The question comes up now as to this work for the next session. The legislature has seen fit to give us a very slight amount of money indeed compared with the work which we do, and we should do as far as we can the broader research work for which the department was originally established. In England the statute revision committee has done this index work. It has not been the work of the draftsmen. According to my interpretation this work properly should be done in the revisor's office.

The number of bills which have been drafted in the department was materially reduced during the last session of the legislature,

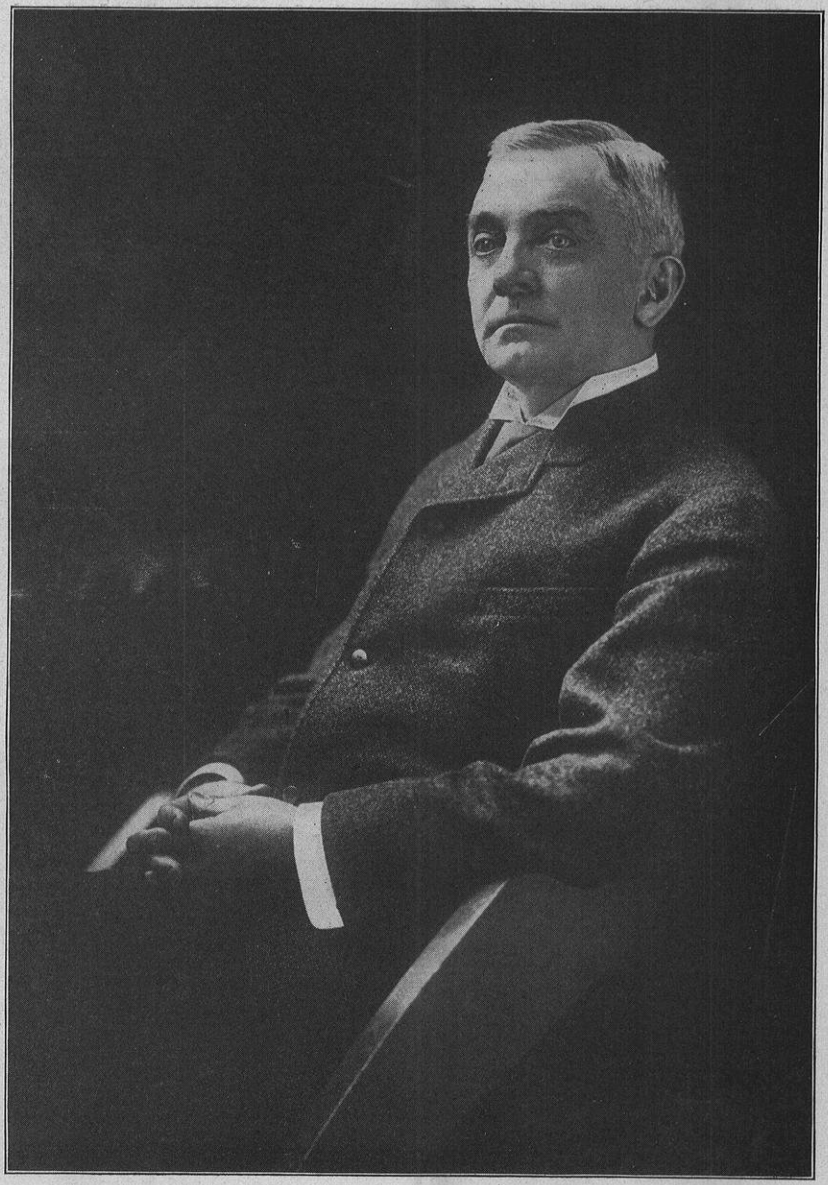
Legislative Reference Department.

but I believe that a law should be passed or a rule made by the legislature to the effect that no bill should be drafted in the department unless it has the signatures of at least ten members of the legislature, or of all the members of a political party if such political party has less than ten members. In this way the department could put its time upon the drafting of bills of the greatest importance rather than on all kinds of bills. If a bill is of sufficient importance to require the signature of ten members then this department should draft it. This process will tend to keep down the number of trivial bills and those which the legislature will not take up.

The index of local, private and special laws has been completed since the last session of the legislature, but it is still in rough shape and needs to be put into form. I said of it at the time of my last report that this index should be eventually printed and that the acts should be so annotated as to show what has been repealed and what still exists. There are hundreds of private rights which nobody knows about and of which there is no track kept and this matter should be all cleared up at once. This department has not, however, the money to continue this work. It seems to me that the revisor should take up this work and publish an index of private, local and special laws, showing what has been repealed and what still exists. This would clear up our whole law and then with our statutes and our revisor's work we would have the whole systematic basis laid for the future in the matter of statute law.

I recommended in my last report that an index of the reports of important data in the journals be made. This has been made and will make accessible for the future a great deal of hidden material from these reports.

When Miss Hasse's index is completed, giving the contents of the administrative reports of the government then we will have that data which is so necessary for the study of the jurisprudence beneath our statute law and for the study of administrative devices. I have predicted in many of the reports that the time will come when there will be a wide-spread movement among thinkers and scholars to gather such administrative data and also to gather, classify and index the decisions of commissions and quasi-judicial



HON. JAMES H. STOUT.

Died December 7th, 1910.

bodies such as the railroad commission and the attorney general. We have never been able to undertake this and if we had an appropriation for that purpose we would be able to help along this study. It seems perhaps too much to ask at this time, however. A country-wide movement along this line is now in progress and there is no doubt that such work will increase in importance as time goes on.

I recommended in my last report that when "our financial condition will justify it that specially trained workers be secured to take up each of the important branches of statute law". On mature consideration I think the time has come for the creation of a large department of research in law in the University of Wisconsin closely correlated with our work here. The relation between the state and the University here has come to such a point that we should have this department of research just as well as we have the department of research into wood or products, or just as much as we should have research into agriculture, or any of the other scientific work now done at the University. This could be easily accomplished with $30,000 or $40,000 a year. Five or six men could be procured at the University, each one of whom would be an expert in some particular branch of work, such as administrative law, history of statute law, procedure of the courts, relation between law and economics, and comparative constitutional law, etc. These men could be placed under a separate contract. This could be arranged so that they would do very little teaching work and a great deal of research work, and when called upon by the legislature of the state they could meet in council and answer specific questions put to them upon matters of statute law or of the jurisprudence beneath statute law. There would be no fear of such a department getting into politics as the duties of such a department should be confined to answering specific questions. Correlated with the work of our department such a department would be of wonderful service to this state and would have a wonderful effect on this country not only upon jurisprudence and statute law but ultimately on those considerations which must come up with the everchanging conditions of our economic life. It is my hope to see such cooperation established in the near future. To carry out this cooperation successfully there should

Legislative Reference Department.

be an extra appropriation for our department of at least $10,000 a year.

We cannot hope to keep the attorneys who are now working in our department as draftsmen at the insignificant sum which we pay them. The work is too important, too great in its scientific influence for good or evil, to keep poorly paid men here. The men we have are good men, but we cannot hope to induce them to remain much longer at the small wages which they now receive, and so it is with all our best workers. We cannot hope to keep many of the people we have at the price which we pay. The department has been a success in every way. It is beyond the experimental stage and if we are to look to the future to do the really great work which we can do, we must have a larger appropriation. The department cannot stand still. It must go backward or forward. Everyone who has examined the work of this department is of the opinion that it has done great service and it has elements of great strength in it. It is, therefore, a good investment for the state and should be well supported. If it is not well supported I predict in the near future that it will go to pieces, because the best people in it will leave and their places cannot be filled because it takes years of special training to fill such places.

In this connection I wish to call your attention to the demand there is for work of this kind. I have on my desk, as I write this report, requests for three indexers from this department at $1,000 each; and one request for a man to run a city department at $1,500. I can fill none of these places. It seems that the University of Wisconsin should maintain some kind of school for special librarians wherein men and women could be taught this work. There are over twenty departments in this country doing this work for the states. There are many city departments starting every day. The national government will probably take up work of this sort within a short time. In fact the whole field of trained workers in public service is opening up in this country. We are only following what Germany has done. This department with its laboratory facilities, with the existence in Madison of the University of Wisconsin, should be able to supply public servants, experts and workers for this whole field of work. Therefore, special courses at the University of Wisconsin in connection

with the Library School, or in connection with this department would be of great service not only to this state and to the states in this country, but would create broad fields of work for many Wisconsin boys and girls. Some will say that we should not do this work for other states. My reply to that criticisn is that we cannot live by ourselves alone. We are a part of a great movement of a great nation and we have our duty to perform wherever we can perform it and the reflex action from what we accomplish in other states upon our own state will in itself be our reward. I hope that the Free Library Commission can take up this matter with the regents of the University and make a request for special library courses which will supply this demand.

Since my last report we have published a bulletin upon tenement house legislation and one upon accident insurance for workmen. We have now in press one upon certified public accountants, and we have brought the initiative and referendum bulletin up-to-date. By the time this report reaches you we will have prepared a revision of the corrupt practic bulletin. These little bulletins have been eagerly sought all over the country as well as in Wisconsin and have been in great demand. It seems too bad that we have not been able to publish more of them, but the demands of the last year made on this department for help to the various committees of the legislature has been so great that it was possible for us to do only what we did.

In this connection during the last year the department has spent considerable sums in expenses in connection with the industrial education committee. It is only fair that the legislature should make an appropriation which will cover the extra and incidental work which is required by such committees. However much these committees do, nevertheless there are incidental things which workers who have received long training can do and which will be constantly demanded of us in this department. In this connection I wish to state that a recent report from the English government upon investigating committees, or royal commissions as they are called, advocates the formation of a special staff of trained investigators for these commissions. The workers in this department are practically trained people of this sort and without the authority of statute have been existing as such. We are indeed willing to do

Legislative Reference Department.

this work but the drain upon our resources and time has been very great and we think it only fair that the legislature should make some provision for this department because of its assistance to these committees. When there are eight or nine committees working outside of the legislative session and we have the great part of material upon which they must start to build their conclusions, it is self-evident that such committees will make a heavy drain upon our resources and time, and I repeat, it will be only justice to this department to recompense it for that time.

In conclusion I wish to call your attention to the heavy strain of work in this department. The work must be done quickly when it is done, and the unsanitary quarters in which we have been living have been a serious detriment to the health and work of this department. This is especially true during the legislative session. Since this department has started it has had the most unfortunate experience with quarters. We do not think it is good investment for the state to allow such conditions to exist and we respectfully request the Free Library Commission to help us to better these conditions.

Respectfully submitted,

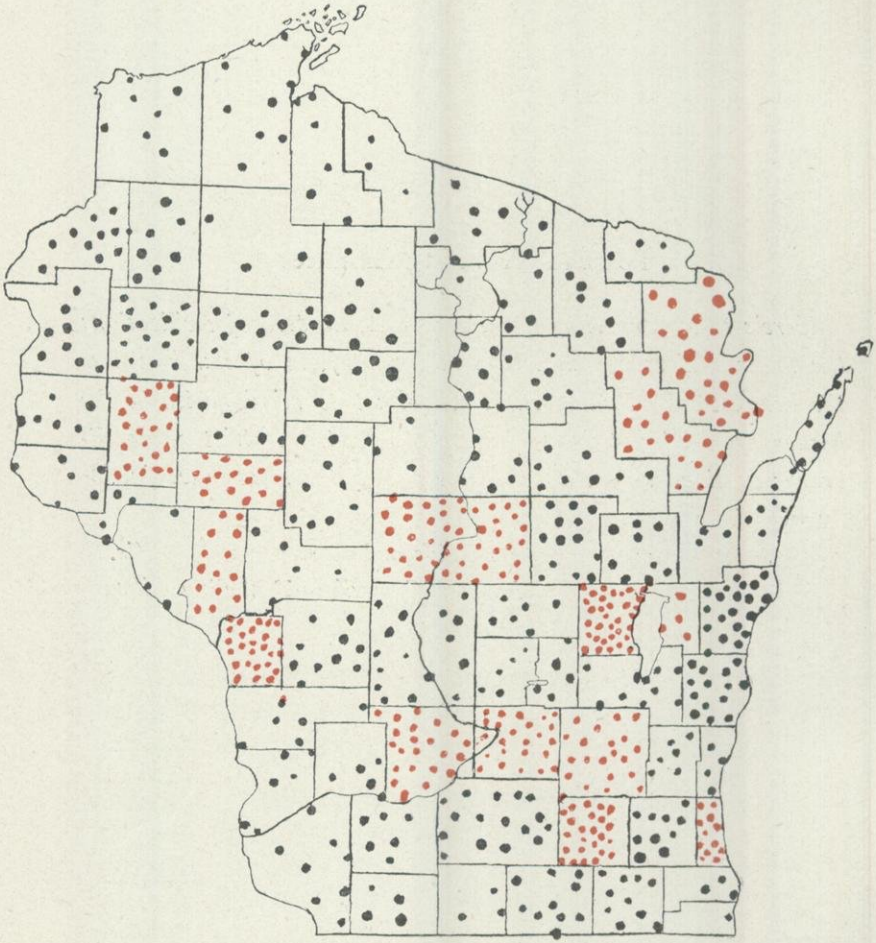
CHARLES MCCARTHY,

Chief of Legislative Reference Department.

Toast to Traveling Libraries

Here's to our traveling libraries; the promoters of civilization; the makers of true homes; the moral uplifters of communities; the benefactors of our district schools; true missionaries in the homes of the isolated; co-operators with the district school library; destined to one day become one of the most powerful influences in our state.

Mrs. Edward Porter, Estella, Wis.
Former Custodian Traveling Library



FREE TRAVELING LIBRARIES IN WISCONSIN

State and County Systems

Red—County Systems.

Black—State System.

Traveling Library Department.

IV

TRAVELING LIBRARY DEPARTMENT

It is through the traveling libraries that the Commission touches the citizens of Wisconsin at the greatest number of points. Traveling libraries promote neighborliness and are thus a great social factor, uniting a community through a common possession and interest. Traveling libraries remove the feeling of isolation. They enable a citizen to gain what James Russell Lowell terms "the best part of a man's education—that which he gives himself." No book is ever placed in any of the state traveling libraries that does not serve at least one of three purposes: it must inform, refresh, or inspire. The books of sociology, science, useful arts, fine arts and other classes serve the first purpose—to inform; the volumes of literature, history and biography inspire; and the works of fiction refresh. Sixty per cent. of the occupants of insane asylums are farmers' wives, driven there by never-ending drudgery. It is hoped to reduce this percentage through the books of wholesome good cheer in the traveling libraries.

As an evidence of the popularity of the libraries as a whole, it may be noted that the circulation of all of the traveling libraries, excluding the study club libraries—these being mainly used for reference purposes—has been 216,439 for the biennial period as against 193,319 for the two preceding years. These figures are not guess-work, as they are taken directly from the book cards upon which entries are made when the books are issued by the librarians. The total circulation is really larger than that given, for no charge on the book card is usually made when the books are read by the family of the custodian of the library.

The growth in the number of stations for the last seven years has been as follows:

1904	190
1906	279
1908	388
1909	465
1910	618

Traveling Library Department.

The Traveling Library Department has not yet reached its ideal. This is due to insufficient appropriation for books, and lack of adequate help. Before rural free delivery was established in Wisconsin, there were over 1,400 post offices. The traveling libraries now owned by the state reach less than half of the places that were large enough in the old days to have post offices. There are hundreds of other settlements that could be supplied were the libraries available. A fund of $5,000 a year could be utilized to the greatest advantage in the purchase of more libraries. The sum of $2,510 was expended for 40 new traveling libraries for rural communities during the last biennial period. During the same period 136 new stations were established, 27 resumed and 11 discontinued, making 152 places to be supplied in addition to the 386 previously existing stations. This shows that the book purchases are not in any way keeping pace with the demand, and that more money should be appropriated.

It should be noted here that in the terms of the commission a "discontinued" station is one now supplied through some other agency, such as a county system of traveling libraries. An "inactive" station is one temporarily without a library but which may resume at any time. Twenty-seven such stations have resumed during the past biennial period. Every effort is made to reduce the number of inactive stations as far as possible, through correspondence, "follow-up letters," and personal visits. Many more stations that become inactive could be again resumed if more time could be given to field work.

There should be more field workers to visit the existing stations and to locate others where needed. It is not generally recognized that Wisconsin is as large as the combined area of Maine, Massachusetts, Vermont and Connecticut. For this teritory of 56,040 square miles, there should be district workers whose business it should be to visit the stations, hold evening meetings in the local town halls or school houses to enlist the interest of more citizens in reading the books provided. Schools should be visited while in session to call attention to the many ways that the volumes in the traveling libraries may be made of use to the teachers and students. Isolated communities should be hunted out and small groups of wholesome books and magazines

THE TOWER HILL LIBRARY BUILDING.

sent for the winter months. Larger places could be stimulated into getting traveling libraries and later establishing small public libraries for themselves. But all this much needed field work cannot now be done with the limited fund at hand. The chief of the Traveling Library Department is the only one in the field at the present time in this large territory, spending about two-thirds of her time in visiting stations, re-establishing discontinued stations, locating new libraries, addressing farmers' institutes, teachers' gatherings, women's clubs and library meetings. The rest of the time is devoted to necessary correspondence, the selection of books for libraries, the study club work and assisting in the general field work of the commission. While many stations are established through correspondence, many more could be located by personal visits. A visit made last fall to the extreme northern part of the state resulted in placing a number of libraries where none had been found before. In Burnett county, ten traveling libraries were located or newly established; in Douglas County, eight new stations or newly established; in Ashland County, three new stations; in Bayfield County, the beginning of a new public library at Iron River, two new traveling library stations and one re-established. In Vilas County four new stations were established during one visit to the county. This work is being done as time permits but the process is slow and many hamlets must wait under existing conditions.

The last biennial report made known the fact that every traveling library was in the field. A waiting list will undoubtedly confront the department during the present winter. For this reason, and the reasons given above, the appeal for $5,000 made by Mr. Legler, while secretary two years ago, is urgently renewed at this time.

The lack of money for books and assistance is also shown in the study club division of the traveling library department. Over eighty clubs have been supplied during the past season with study club libraries, while others have received magazine references. The Wisconsin federation of women's clubs, and the state library commission came into existence during the same year, and have always remained in the closest association. The thirteen study club libraries that were owned by the state federation were turned

Traveling Library Department.

over several years ago to the state library commission for circulation among federated and unfederated clubs. The Chief of the Traveling Library Department has served as chairman of the literary reference bureau of the Federation for many years past. At the present time the commission has 111 study club libraries at its disposal, together with about 800 volumes in its "open shelf" department. The state historical library has loaned 11 libraries on Wisconsin history, all of which are now in the field. The historical library, university library and the city library have been most kind at all times in supplying reference material. All requests for debating material for high schools and other organizations have been sent to the University Extension Division of the University of Wisconsin, this being properly one of the division's activities.

In the department's endeavor to reach all classes, boxes of illustrated weeklies and other miscellaneous illustrated periodicals have been sent to lumber camps and to the Indian reservations.

I desire to record my appreciation of the work done by the executive clerk, and the assistants of the department. It is no easy matter to make over 1,200 exchanges of libraries a year, in addition to sending out hundreds of groups, study material, and periodicals. The receipt of each library must be entered upon both *place* and *library* cards. The library is then checked up for losses, the circulation taken, and each book examined for loose leaves or other injury. The books are then mended or sent to the bindery, the remaining books being wrapped to be ready for issuance when the library is again made complete.

The system used has been reduced to the lowest possible terms of detail, but much routine is still necessary. Twelve items in the way of supplies, in addition to the books proper, are sent with every library, all of which are carefully checked. The above does not take into account all the preparation that the new books must undergo in the way of order cards made, books checked from bills, opened for the first time, stamped, "pocketed," library and book numbers assigned, shelf and series cards made, etc. The full time of only three people and the half-time of another is given to this work—a small force indeed when all the labor involved is considered.

Traveling Library Department.

The thanks of the Commission are due to Mr. Walter E. Larson, state inspector of rural schools, for making known the fact to rural school teachers and officers that traveling libraries may be secured for rural communities. The commission is indebted to Mr. Larson more than to any other citizen in the state in this connection.

The recent publication of the Handbook of Traveling Libraries with Directory of Stations, copies of which may be secured, makes unnecessary a more extended report at this time.

MISS L. E. STEARNS,
Chief of Traveling Library Department.

The foregoing report of the Wisconsin Free Library Commission and its various departments for the biennial period ending June 30, 1910, is respectfully submitted to the commission.

MATTHEW S. DUDGEON,
Secretary.

July 1, 1910.

Necrology.

NECROLOGY

It is with regret that we record the death of Senator James H. Stout, who died at his home in Menomonie, December 7, 1910. It was he who first established a traveling library system in Wisconsin, expending in doing so his personal funds; it was he who in the state senate secured the first appropriation for a commission, who became the commission's first chairman, who by persistent interest secured various advanced appropriations, who by his legislative support and by his counsel as chairman made it possible to establish the library school. He was chairman of the commission from 1897 to 1905, when the increased cares of his private affairs forced him to give up the work. After his resignation he was succeeded as a member of the commission and as chairman, by Hon. James M. Pereles of Milwaukee.

It becomes necessary also to record the death of Judge James M. Pereles, who died in Milwaukee, December 11, 1910, after an illness which had held him in its grasp more or less closely for many months. The public spirit which Judge Pereles exhibited in his relation to public affairs made of him when he came in contact with the libraries of the state a patron who did much to further the library cause. Wherever he found an opportunity to aid in the work, he was quick to act. Many gifts in the interests of the libraries of the state marked his career. Among those we may note the more recent gift of the beautiful electroliers presented to the south side branch library of Milwaukee. We must also note his continued maintenance of two liberal scholarships in the Wisconsin Library School, these last being a tribute to his wife, and denominated the Jennie W. Pereles scholarships. Judge Pereles was for many years the president of the Milwaukee Library Board and, at the time of his death, was, and for some years had been, chairman of the Wisconsin Library Commission.

It is a strange fatality that requires us to record these two deaths occurring within a few days of each other, the deathsof the only two chairmen which the Wisconsin Library Commission has ever had.

JUDGE JAMES M. PERELES,

Died December 11, 1910.

Statistics of Libraries.

LIBRARIES IN STATE INSTITUTIONS

Name of Library	Place	No. vols.	Librarian
Home for feeble minded	Chippewa Falls	352	A. W. Wilmarth.
Industrial school for boys	Waukesha	1,950	
Normal school	La Crosse	2,539	Florence S. Wing.
Normal school	Milwaukee	14,961	Delia G. Ovitz.
Normal school	Oshkosh	14,596	Louise F. Encking.
Normal school	Platteville	7,052	Bee A. Gardner.
Normal school	River Falls	6,775	Lovila M. Mosher.
Normal school	Stevens Point	12,241	Mrs. E. M. Short.
Normal school	Superior	8,700	Harriet L. Eaton.
Normal school	Whitewater	10,000	Grace E. Salisbury.
Northern hospital for insane	Winnebago	1,026	
School for the deaf	Delavan	3,800	
State historical library	Madison	331,567	I. S. Bradley.
State hospital for insane	Mendota	1,350	
State law library	Madison	50,000	G. G. Glasier.
State reformatory	Green Bay	500	
State tuberculosis sanatorium	Wales	200	
University of Wisconsin	Madison	150,000	Walter M. Smith.

STATISTICS OF LIBRARIES

PLACE.	Population census 1905.	Tax.	Other receipts.	Total.	EXPENDITURES.					Volumes.	Borrowers.	CIRCULATION.			Librarian.
					Books, periodicals and binding	Rent, heat and light.	Miscellaneous.	Salaries.				Fiction.	Non-fiction.	Total.	
								Librarian and assistants.	Janitor.						
Antigo	6,663	$2,622 00	$1195 00	$3,217 00	$684 65	$462 02	$414 10	$1,000 00	$321 00	4,368	4,362	14,771	7,321	22,092	*Emilida Baensch.
Appleton	17,000	3,000 00	847 47	3,847 47	803 88	.....	974 75	1,525 00	360 00	11,378	3,991	39,537	14,665	54,202	Agnes L. Dwight.
Arcadia	1,316	500 00	48 68	548 68	168 24	28 50	47 13	120 00	85 10	1,917	928	5,789	997	6,786	Louise Gasser.
Ashland	14,519	.....	79 28	.....	541 97	790 55	462 60	780 00	780 00	6,204	2,164	14,289	6,324	20,613	Cecile M. Fennelly.
Baraboo	5,835	2,150 00	204 55	2,354 55	849 77	154 09	219 69	780 00	225 75	7,962	2,727	21,401	7,970	29,371	Kate M. Potter.
Bayfield	1,689	1,000 00	100 00	1,100 00	103 60	179 55	141 75	360 00	100 00	3,289	984	3,818	369	4,187	Mrs. Winnie Robison.
Beaver Dam	5,615	1,400 00	24 50	1,424 50	296 91	417 15	286 43	960 00	.....	8,139	1,669	17,434	6,807	24,241	Hattie A. Doolittle.
Belleville	423	214 80	9 72	224 52	85 67	.....	13 16	65 00	.....	2,437	294	3,159	338	3,497	Goldie DeWitt.
Beloit	12,855	4,000 00	303 67	4,303 67	2,080 01	352 47	459 41	1,185 00	455 00	13,078	6,173	31,530	12,986	44,516	Nellie M. Myers.
Berlin	4,638	1,000 00	334 16	1,334 16	276 09	328 50	384 46	375 00	23 05	4,553	1,590	11,633	3,921	15,554	Margaret Biggert.
Black River Falls	1,946	400 00	14 89	414 89	150 29	42 50	116 57	215 00	10 50	2,338	445	5,583	1,853	7,436	Anna C. Wylie.
Bloomington	.....	100 00	67 83	167 83	40 00	110 00	14 93	.....	2 90	785	416	.....	.....	2,591	Mary E. McIver.
Brodhead	1,667	300 00	279 06	579 06	362 11	49 63	92 13	266 00	37 50	2,026	946	6,772	3,921	10,693	Jessie E. Sprague.
Burlington	2,625	.....	222 11	222 11	88 14	.....	18 46	.....	.....	926	484	4,028	531	4,559	Alma Neuhaus.
Chippewa Falls	9,009	2,500 00	80 44	2,580 44	775 81	190 98	536 17	960 00	300 00	8,996	3,017	25,641	10,453	36,094	Marion E. Bryant.
Clintonville	1,837	400 00	29 91	429 91	103 84	.....	24 00	100 00	.....	1,111	715	3,540	900	4,440	*Mrs. F. A. Sedgwick.
Colby	849	173 00	102 00	275 00	78 87	56 25	190 59	27 60	90 00	906	264	2,842	706	3,188	C. J. Bryant.
Colfax	640	100 00	9 75	109 75	25 00	.....	9 53	72 00	.....	348	310	2,959	745	3,704	Anna Fuller.
Columbus	2,388	1,000 00	152 95	1,152 95	245 88	97 27	84 65	565 00	45 40	3,934	1,492	12,746	6,837	19,583	Nellie A. Loomis.
Cumberland	1,493	1,000 00	35 73	1,035 73	419 60	224 44	91 79	450 00	.....	3,387	774	9,763	2,124	11,887	Mrs. G. E. Carr.
Darlington	1,843	1,000 00	49 88	1,049 88	603 37	216 97	68 86	240 00	75 00	4,521	1,124	9,847	1,958	11,805	Isabella J. Bird.
Delafield	632	.....	4 80	4 80	.....	.....	4 80	.....	.....	539	60	.....	.....	1,380	Maud Hanson.
Delavan	2,321	1,500 00	657 77	2,157 77	481 12	357 40	143 36	840 00	338 80	3,377	1,131	12,967	5,178	18,145	Laura F. Angell.
DePere	4,583	1,206 25	91 97	1,298 22	389 44	83 37	237 80	420 00	59 50	5,016	1,372	13,600	4,515	18,115	Helen S. Mathews.
Dodgeville	2,152	200 00	.....	200 00	104 90	21 87	29 48	60 00	.....	.....	.....	.....	.....	5,599	Mrs. Anna Topliffe.
Durand	1,359	750 00	102 18	852 18	275 09	64 42	300 29	305 00	37 50	2,629	729	8,000	2,357	10,357	Mrs. E. M. Dunlap.
East Milwaukee	473	35 00	1 47	36 47	25 67	.....	3 99	.....	.....	259	45	240	66	306	Hildegarde Neuman.
Eau Claire	1,837	5,500 00	371 35	5,871 35	1,367 29	670 27	859 76	2,262 46	697 57	19,255	5,091	35,536	20,023	55,559	*Mary A. Smith.
Edgerton	2,416	1,000 00	75 12	1,075 12	390 54	220 82	247 35	587 50	.....	.....	.....	.....	.....	.....	Mrs. George Farman.
Eleva	331	5 00	28 77	33 77	.....	.....	6 00	.....	.....	450	197	228	209	937	*Fay Jones.

Elkhart	462	25 00						10 40	15 00		830	122				H. C. Dornbush.
Elkhorn	1,818	500 00	249 00	749 00	173 70	240 40	74 70	220 00		3,420	599	6,483	2,121	8,604	Edna L. Durthick.
Elroy	2,011	1,000 00	455 70	1,455 70	361 66	186 19	148 16	300 00	300 00	1,909	858	11,861	2,472	14,333	Edna L. Roberts.
Evansville	1,963	1,000 00	105 75	1,105 75	164 94	237 11	76 00	300 00	174 51	3,500	1,435	10,098	5,972	16,070	*Mrs. Hattie J. Boyd.
Fairchild	806	100 00	6 58	106 58	28 74		6 74	50 00		454	245			2,195	Mrs. L. W. Foster.
Fond du Lac	17,281	5,000 27	1,851 28	6,851 55	1,200 48	543 62	984 20	2,574 18	675 25	27,336	2,397	43,054	10,100	53,154	Emma E. Rose.
Fort Atkinson	3,300	1,079 76	26 29	1,106 05	339 13	176 78	117 91	300 00	29 70	4,004	1,022	9,101	3,757	12,858	Sue C. Nichols.
Fox Lake		100 00	208 33	308 33	166 58		23 24	25 00		434	348	3,625	49	3,674	Mary E. Collins.
Genoa Junction	710	30 00	43 08	73 08	54 82		36 17			975	585			3,436	Mrs. E. E. Manor.
Grand Rapids	6,157	500 00	915 19	1,415 19	793 74		1,569 71	720 00		7,116	3,065	15,809	6,680	22,489	Edith Rablin.
Green Bay	23,584	6,500 00	218 90	6,718 90	2,795 30	614 23	898 24	2,325 24	431 25	17,365	4,490			66,934	Deborah B. Martin.
Hartford	2,052	300 00	59 00	359 00	208 33		32 34	100 00		1,407	684	9,980	935	10,915	Juno H. Goetz.
Hayward	2,900	833 78	19 09	852 09	540 40	133 55	299 12	300 00	120 00	4,354	927	11,388	3,931	15,319	Clarence O. Bayo.
Horicon	1,558	300 00	168 40	468 40	151 71	90 00	16 00	240 00		1,650	650	3,928	755	4,683	Frances Zedler.
Hortonville	890	100 00	13 64	113 64	28 84		19 57	52 00		443	366	1,984	166	2,150	Anna Ritger.
Hudson	3,220	1,200 00	394 69	1,594 69	353 65	183 74	121 75	590 00	143 00	3,843	1,843	18,238	6,821	25,059	Pearle G. Schoemaker
Independence	633	250 00	8 47	258 47	161 25		30 02	50 00	12 00	1,265	321	3,492	605	4,097	*Minnie Cole.
Janesville	13,770	4,500 00	511 00	5,011 00	889 26	698 05	653 29	1,795 00	720 00	20,538	7,692	44,194	19,776	63,970	*Gertrude J. Skavlem.
Jefferson	2,572	300 00	10 25	310 25	315 00	70 00	35 00	100 00		810	715			5,463	Mayme Trager.
Kaukauna	4,901	1,200 00	70 75	1,270 75	283 77	231 55	135 67	432 00	172 50	4,433	2,148	14,294	3,503	17,797	Lillian E. Bell.
Kenosha	16,235	18,631 58	352 54	19,014 12	2,941 38	524 92	8,953 76	3,288 00	780 00	21,875	6,158	57,357	37,567	94,924	Mrs. Clara P. Barnes.
Kewaunee	1,719	569 50	56 05	625 55	115 57	236 50	34 15	240 00	20 00	2,019	836			15,203	Mrs. M. Brunckhorst.
Kilbourn	1,091	337 04	5 60	372 64	280 65	10 00	6 45	240 00		3,671	644	10,500	2,066	12,566	Lillian Ramsay.
La Crosse	29,078	5,000 00	1,814 60	6,814 60	1,616 75	880 39	1,105 41	3,492 00	854 79	18,781	8,849	57,589	22,842	80,431	Mary A. Smith.
Ladysmith	1,720	1,000 00	27 30	1,027 30	255 53	91 38	45 72	305 76		1,246	961	6,718	552	7,270	Mabel Sinclair.
Lake Geneva	3,419	2,191 82	744 87	2,906 69	247 50	291 18	722 81	900 00	198 00	4,363	1,350	9,820	4,214	14,034	Gertrude J. Noyes.
Lake Mills	1,602	600 00	209 80	809 80	332 14	123 44	4 64	260 00	95 00	3,313	995	7,013	3,123	10,136	Florence Mosher.
Lancaster	2,555	600 00	37 81	637 81	254 34	169 46	30 89	180 00	8 60	2,746	1,160	8,546	1,782	10,328	Bessie McNair.
LaValle	359			21 79	65 26	14 00	9 84	60 00		890	437	4,163	73	4,236	Mrs. Etta Godden.
Lone Rock	604					5 00				300	125				Mrs. M. B. Shannon.
Madison	24,301	10,000 00	1,199 04	11,199 04	2,432 92	228 03	1,245 06	3,938 50	982 81	23,870	2,433	75,387	40,897	116,284	*George B. Averill.
Manitowoc	12,733	3,000 00	637 63	3,667 63	696 34	349 47	506 97	1,180 10	600 00	9,743	4,196	26,138	17,932	44,070	Lucile Cully.
Marinette	15,354	4,000 00	262 36	4,262 36	1,194 57	422 65	579 80	1,636 59	423 70	11,221	3,738	32,843	10,737	43,580	Ada J. McCarthy.
Marshfield	6,035	1,522 00	92 15	1,614 15	376 01		146 38	900 00	33 00	5,886	3,197	18,163	12,615	30,778	*Esther Johnston.
Mayville	1,793	450 00	253 95	703 95	245 66	143 97	22 68	240 00		1,372	652	5,384	810	6,194	Etta Barott.
Mazomanie	863	85 00	20 90	105 90	79 09		8 30	35 00		763	631			3,982	Edna B. Woolrich.
Menasha	5,960	2,541 00	563 48	3,104 48	447 49	419 18	128 99	920 00	300 00	7,755	1,966	19,276	9,520	28,896	Lucy L. Pleasants.
Menomonie	5,473									13,984	3,660	33,300	15,741	49,041	Stella Lucas.
Merrill	9,197	1,750 00	7,044 15	8,794 15	438 49		66 21	225 00		12,184	1,570	17,193	5,423	22,616	Katherine Barker.
Milton Junction	500	100 00	6 03	106 03			4 02			572	416	3,926	128	4,054	Mrs. F. R. Morris.
Milwaukee	312,948	98,000 00	4,750 76	102,750 76	20,087 50	2,257 50	15,532 16	49,970 17	5,294 35	219,870	47,283	679,092	248,995	928,087	George W. Peckham.
Mineral Point	3,252	250 00	222 20	472 20	91 45	150 98	113 51	179 00		5 047	987	9,442	1,302	10,744	Margaret A. Crawford
Mondovi	1,450	440 00	28 86	468 86	66 05	35 75	44 01	148 75	49 75	2,008	1,332	4,862	4,650	9,512	Amy Humphrey.
Monroe	4,269	1,500 00	237 79	1,737 79	735 67	97 62	292 00	612 50		7,548	1,768	17,105	7,726	24,831	Katherine Smock.
Mosinee	539	300 60	201 14	501 14	102 24	58 19	61 50	369 90		2,030	320	2,126	1,577	3,703	*Bernice Gray.
Neenah	6,047	2,621 07	188 88	2,809 95	785 77	333 79	514 54	840 00	540 00	11,954	2,932	23,546	10,052	33,598	Cora I. Lansing.
Neillsville	2,117	566 37	30 18	596 55	397 45		79 07	312 00		3,353	1,972	9,085	2,139	11,224	Mary U. Hoey.
New London	3,002	450 00	28 00	478 00	239 41		142 67	240 00		2,266	1,435	9,336	3,490	12,826	Alice Millerd.

STATISTICS OF LIBRARIES—Continued.

PLACE.	Population census 1905.	EXPENDITURES. Tax.	Other receipts.	Total.	Books, periodicals and binding	Rent, heat and light.	Miscellaneous.	Salaries. Librarians and assistants.	Janitor.	Volumes.	Borrowers	CIRCULATION. Fiction.	Non-fiction.	Total.	Librarian.
New Richmond	1,824	474 63	43 12	517 75	567 22	5 73	15 84	109 00	9 10	1,986	345	5,933	2,830	8,763	Mrs. Anna P. Epley.
N. Fond du Lac	1,944	225 00	19 50	244 50	18 24	.....	34 84	172 75	.....	1,43	942	6,019	3,243	9,262	Edith C. Birdsall.
N. Freedom	578	40 00	54 78	94 78	23 63	13 60	12 95	12 00	.....	651	225	2,710	400	3,110	Alice McCoy.
N. Milwaukee	1,236	400 00	9 47	409 47	161 56	.....	12 92	200 00	.....	1,60	793	5,728	339	6,067	Annie G. Godfrey.
Oakfield	548	109 60	10 27	119 87	135 11	24 99	30 50	25 50	2 90	1,269	342	3,278	115	3,393	Helen Smith.
Oconomowoc	3,013	.....	.....	.....	.....	.....	.....	.....	.....	5,326	1,097	8,308	754	9,062	Jennie C. Walther.
Oconto	5,722	1,500 00	103 92	1,603 92	583 80	192 35	204 92	680 00	192 00	6,725	2,178	20,692	18,162	38,854	Gladys M. Tallett.
Oconto Falls	1,301	204 00	6 74	210 74	37 79	72 00	4 12	104 00	1 00	623	495	.....	.....	.....	Mrs. Maggie Digan.
Oshkosh	33,575	4,000 00	3,784 43	7,784 43	3,347 09	837 78	1,235 45	2,651 79	1,260 00	23,576	7,964	77,103	28,997	106,100	*Miriam Noyes.
Park Falls	1,438	300 00	41 95	341 95	69 78	.....	8 77	150 00	.....	477	530	3,728	.....	3,728	Mrs Cecile C. Paquin
Pewaukee	763	144 00	15 62	159 62	100 00	88 00	7 31	.....	25 00	2,247	.....	.....	.....	4,335	Jennie S. Clark.
Platteville	4,434	1,000 00	203 01	1,203 01	232 30	180 00	86 58	445 00	14 00	2,555	1,378	13,024	2 760	15,784	Carrie G. Nicklas.
Plymouth	2,764	1,051 15	134 09	1,185 24	380 00	249 90	20 63	430 00	25 50	3,352	1,402	12,780	2,389	15,169	Grace Prescott.
Portage	5,524	1,400 00	109 22	1,509 22	491 97	.....	111 22	754 00	.....	8,788	2,221	19,831	9,890	29,721	Mrs. W. G. Clough.
Prairie du Chien	3,179	50 00	96 29	146 29	62 68	.....	29 30	.....	15 00	457	609	.....	.....	.....	Hazel Savage.
Prairie du Sac	671	200 00	12 34	212 34	234 02	.....	6 11	57 20	9 00	1,027	418	4,801	98	4,899	Estella M. Carpenter
Racine	32,290	8,000 00	1,645 34	9,645 34	3,592 14	609 51	951 25	3,511 15	840 00	18,394	8,491	75,861	31,598	107,459	Mary J. Calkins.
Randolph	818	.....	.....	.....	.....	.....	.....	.....	.....	432	321	.....	.....	.....	Mrs. J. H. Davis.
Reedsburg	2,515	600 00	43 35	643 35	269 20	13,50	67 01	287 25	65 20	3,261	1,635	9,245	3,871	13,116	Mrs. N. A. Cushman.
Rhinelander	5,435	1,800 00	343 48	2,143 48	320 33	154 50	193 19	751 25	304 25	5,233	2,815	12,716	8,384	21,100	Harriet L. Allen.
Rice Lake	3,410	1,000 00	.....	1,000 00	417 90	78 00	97 27	330 00	86 50	4,319	1,813	14,849	2,027	16,876	Mrs. James Robbins.
Richland Center	2,635	1,000 00	111 67	1,111 67	376 14	217 86	49 43	300 00	140 00	3,767	1,359	10,212	2,675	12,887	*Vera Eastland.
Ripon	3,811	1,200 00	240 00	1,440 00	160 00	350 00	155 00	535 00	240 00	5,730	1,380	10,253	6,051	16,304	Blanche Thompson.
Seymour	1,118	150 00	66 73	216 73	97 75	.....	113 42	50 00	.....	900	321	2,808	160	2,968	Cora M. Lampson.
Shawano	2,443	375 00	327 57	702 57	243 43	168 00	138 91	183 00	.....	1,523	622	5,624	632	6,256	Lulu M. Roberts.
Sheboygan	24,026	4,797 24	1,611 10	6,498 38	2,219 73	946 38	277 49	1,914 17	600 00	11,705	6,126	43,456	9,890	53,346	Bertha Marx.
Shell Lake	1,137	175 00	53 29	228 29	133 98	66 80	24 14	84 00	6 00	780	396	.....	.....	6,637	Helga Agren.
So. Milwaukee	5,284	100 00	20 00	120 00	29 05	.....	9 25	50 00	.....	542	342	4,211	1,209	5 420	Stella A. Whalen.
Sparta	3,807	1,900 00	151 23	2,051 23	449 29	491 48	182 16	630 00	203 75	7,005	1,875	19,890	8,400	23,290	Jennie Scouten.
Spring Green	770	.....	42 44	....	30 45	.....	16 30	25 00	85	632	262	1,109	104	1,213	Nettie M. Hayes.

Stanley	2,722	1,200 00	8 96	1,208 96	208 67	108 78	55 93	568 75	74 00	3,038	1,427	7,601	4,357	11,958	Martha E. Dunn.
Stevens Point	9,022	2,000 00	51 37	2,051 37	457 23	472 07	396 05	960 00	300 00	6,048	6,297	26,521	14,486	41 001	Molly L. Catlin.
Stoughton	4,244	1,300 00	.....	1,300 00	236 10	435 00	30 75	446 50	219 00	3,359	1,945	13,550	3,916	17,466	Ananda Drotning.
Sturgeon Bay	4,640	1,300 00	61 31	1,361 31	281 05	456 00	123 34	365 67	.....	2,038	1,695	11,704	1,870	13,574	Marion G. Lown.
Sun Prairie	1,086	150 00	66 85	216 85	85 84	.....	10 10	50 00	.....	871	3 7	2,919	157	3,076	Josephine A. Thomas.
Superior	36,551	10,000 00	471 86	10,471 86	3,546 59	301 53	975 41	3,857 34	857 00	20.247	6,292	67,967	31,203	99,170	*Ethel F. McCollough.
Thorp	878	211 80	7 78	219 58	120 55	.....	42 03	60 00	....	1,402	464	.....	.....	6,0 4	Mary Phillips.
Token Creek	.....	.....	8 00	.....	7 00	.....	50	.....	.....	295	.....	.....	.....	.....	Mary F. Connor.
Tomah	3,008	.....	50 11	.....	300 05	59 57	62 11	300 00	24 00	3.404	1,112	15,663	3,281	18,944	C. W. D. VosWinkle.
Two Rivers	4,602	1,125 00	199 75	1,324 75	311 30	166 45	32 14	840 00	.. ....	4,2 1	1,193	12,417	2,680	15,097	Lizzie G. Baetz.
Viroqua	2,032	1,000 00	257 39	1,257 39	221 61	208 84	110 18	340 00	70 25	3.776	1.379	9,577	1.808	11.385	Clara A. Glenn.
Washburn	4,924	1.800 00	24 00	1,824 00	51 0.)	234 25	88 43	520 00	162 50	4,68	1,248	11,288	4,695	15,983	Mrs. M. M. Greenwood
Waterloo	1.106	150 00	8 29	158 29	.....	65 00	4 88	26 00	.....	1,382	.....	.....	.....	.....	Lenore Hiebel.
Watertown	8,623	2.120 00	370 41	2,490 41	415 88	286 08	351 21	915 00	480 00	5,875	2,863	26,635	13,941	40,576	Gabriella Ackley.
Waukesha	6,949	1,500 00	1 9 40	1,609 40	318 51	413 57	470 65	543 00	300 00	6,6 5	3,83	32,686	3,817	36,50	Fannie L. Ells.
Waupaca	2,873	700 00	97 92	797 92	265 34	106 62	120 75	342 50	20 00	3.477	1,604	12,252	1,828	14,080	Mary Benlick.
Waupun	3,111	1.000 00	45 81	1,045 81	203 48	175 80	56 84	375 00	112 00	6.651	1.651	12,304	3,829	16.133	Kathrene L. Bunker.
Wausau	14,458	2,900 00	270 04	3,170 04	996 82	391 02	429 77	1. 80 00	202 50	6 761	4,921	31,549	14,335	45.884	*Mary Watkins.
Wauwatosa	2,913	1,000 00	47 24	1,047 24	531 40	82 41	169 10	480 00	108 33	5,233	1,39	9.862	2,937	12,799	Winefred Bailey.
West Allis	2,306	500 00	25 00	525 00	192 11	61 00	63 20	240 0	.....	.....	.....	.....	.....	.....	Edna Philip.
West Bend	2,362	400 00	59 37	459 37	142 37	.....	38 42	215 00	6 00	2,722	921	6,218	1,208	7,426	Clara E. Rolfs.
Whitehall	700	200 00	429 50	629 50	135 49	59 00	75 60	375 00	.....	2,245	1,009	4.5 5	816	5,411	A. Francena Chaffe.
Whitewater	3,108	1.500 00	.....	1,500 00	263 01	291 45	98 94	543 45	150 00	6.304	3,547	15,739	5,620	21,359	Ella A. Hamilton.

* CHANGES IN LIBRARIANS SINCE ANNUAL REPORT WAS MADE.

Antigo	Harriet Bixby.
Clintonville	Clara M. Lang.
Eau Claire	No appointment.
Eleva	Laura Robinson.
Evansville	Bernice Gray.
Independence	Edna J. Elstad.
Janesville	Lydia E. Kinsley.
Madison	Mary A. Smith
Marshfield	Blanch L. Unterkircher.
Milwaukee	Charles E. McLenegan.
Mosinee	Fern H. Clark.
Oshkosh	Julia Rupp.
Richland Center	Marie Muth.
Superior	Flora B. Roberts.
Wausau	Grace M. Stevens.

Statistics of Libraries.

TRAVELING LIBRARY STATIONS—1909–1910.

Kind	Total July 1, 1908	Added	Discontinued	Resumed	Total July 1, 1910
English	195	136	11	27	*347
Fiction	17	1	4	.....	14
Juvenile	6	5	2	.....	9
New book	11	5	1	.....	15
Town	13	34	7	.....	40
Study	65	15	.....	.....	80
German	67	11	4	.....	74
Norwegian	21	8	.....	.....	29
Polish	4	6	.....	.....	10
Totals	399	221	29	27	618

*Includes those temporarily inactive.

TRAVELING LIBRARIES—1909—1910

Kind	On hand July 1, 1908		Additions		Total July 1, 1910	
	Libraries	Volumes	Libraries	Volumes	Libraries	Volumes
English	244	13,087	40	2,205	284	15,292
Fiction	17	432	.....	.....	17	432
Juvenile	8	343	.....	.....	8	343
New book	13	650	8	400	21	1,050
Town	11	1,100	30	3,000	41	4,100
Study club	80	2,880	31	1,119	111	3,999
German	94	3,361	7	315	101	3,676
Norwegian	33	1,155	7	245	40	1,400
Polish	.....	.....	9	295	9	295
Totals	500	23,008	132	7,579	632	30,587

TRAVELING LIBRARY GROUPS—SMALL COLLECTIONS OF FOREIGN BOOKS, ETC.

Kinds	On hand July 1, 1808		Additions		Total July 1, 1908	
	Groups	Volumes	Groups	Volumes	Groups	Volumes
Bohemian	10	116	.....	.....	10	116
Danish	.....	.....	3	28	3	28
French	.....	.....	1	21	1	21
German	114	1,149	.....	.....	114	1,149
Norwegian	29	290	5	76	34	366
Polish	.....	.....	27	272	27	272
Special	.....	.....	28	541	28	541
Swedish	.....	.....	5	54	5	54
Totals	153	1,555	69	992	222	2,547

Statistics of Libraries.

CIRCULATION OF TRAVELING LIBRARIES

Kind	1905-1906	1907-1908	1909-1910
English	90,498	142,066	165,023
Foreign	31,599	51,253	51,416
Total	122,097	193,319	216,439

COUNTY SYSTEMS OF TRAVELING LIBRARIES

County	Headquarters	Number of libraries	Active stations	Custodians
Columbia	Portage	21	17*	Mrs. W. G. Clough.
Dodge	Madison	16	14	J. L. B. Thomas.
Dunn[1]	Menomonie	37	22*	Mrs. G. Rafferty.
Eau Claire	Eau Claire	13	13	Public Library.
Jefferson	Jefferson	22	22	A. J. Thorne.
La Crosse	La Crosse	27	26	Miss Mary Alice Smith.
Marinette	Marinette	32	20	Miss Ada J. McCarthy.
Milwaukee	Milwaukee	10	10	Joseph V. Cargill.
Oconto	Oconto	24	17*	Miss Gladys M. Tallett.
Portage	Stevens Point	25	19*	Miss Mollie Catlin.
Sauk	Baraboo	22	22	Miss Kate M. Potter.
Trempealeau	Whitehall	14	14	Miss A. F. Chaffee.
Winnebago	Oshkosh	36	31*	Miss Julia Rupp.
Wood[2]	Grand Rapids	35	27*	Miss Edith Rablin.
		334	274	

[1] Maintained by Hon. J. H. Stout.
[2] Maintained by the J. D. Witter estate.
* In many cases two libraries are sent to one station, the number seemingly on hand being thus decreased.

List of the Publications of the Commission.

LIST OF PUBLICATIONS OF THE COMMISSION

American social questions (bibliographies)
- 1 Negro problem
- 2 Immigration
- 3 Labor
- 4 Poverty
- 5 Wealth
- 6 Business morals

Anniversaries and holidays

Biennial report, v. 1–8

Check list of journals and public documents of Wisconsin, 1903

Circulars of information:
- 1 Establishing a library, first steps
- 2 How to secure a traveling library
- 3 Suggestions for library rules and regulations
- 4 Magazines for the small library
- 5 Campaigning for a public library
- 6 Legislative reference department
- 7 Traveling libraries in Wisconsin

Legislative reference department bulletins:
- 1 Railway co-employment
- 2 Lobbying
- 3 Corrupt practices at elections (out of print)
- 4 Exemption of wages
- 5 Municipal electric lighting (out of print)
- 6 Trust company reserves (out of print)
- 7 Taxation of trust companies (out of print)
- 8 Municipal gas lighting (out of print)
- 9 Boycotting (out of print)
- 10 Blacklisting (out of print)
- 11 Initiative and referendum (see no. 21)
- 12 The recall (out of print)
- 13 Primary elections
- 14 Proportional representation
- 15 Juvenile courts
- 16 Telephones; interchange of service
- 17 Mortgage taxation
- 18 Municipal home rule charters
- 19 Tenement house legislation, state and local
- 20 Accident insurance for workingmen
- 21 Initiative and referendum: state legislation
- 22 Certified public accountants

List of the Publications of the Commission.

Instructional department pamphlets:

1 Wisconsin library school, 1909–10
2 Short course, library school, 1910
3 Picture collections in small libraries
4 Supplementary course, library school, 1908
5 Commercial geography
6 Books on missions
7 How to care for books in a library

Miscellaneous pamphlets:

Laws of Wisconsin relating to libraries and the free library commission
Library extension, by E. A. Birge, 1905
One hundred popular German books
Some Wisconsin library buildings

tudy outlines:

1 Japan
2 Russia
3 Canada
4 Travel in England and Wales
5 Travel in Scotland and Ireland
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 Wisconsin History

Wisconsin library bulletin (bi-monthly) January, 1905, to date

FOURTEENTH BIENNIAL REPORT

OF THE

BOARD OF REGENTS

OF

NORMAL SCHOOLS

OF WISCONSIN

For the School Years 1908-9, 1909-'10.

MADISON
DEMOCRAT PRINTING COMPANY, STATE PRINTER
1910

BOARD OF REGENTS OF NORMAL SCHOOLS

REGENT EX-OFFICIO.

THE STATE SUPERINTENDENT, C. P. CARY.

REGENTS APPOINTED.

MRS. THEODORA W. YOUMANS,	Term expires February 1, 1911.
C. H. CROWNHART,	Term expires February 1, 1911.
THEODORE KRONSHAGE,	Term expires February 1, 1912.
DUNCAN McGREGOR,	Term expires February 1, 1912.
EMMET HORAN,	Term expires February 1, 1913.
THOMAS MORRIS,	Term expires February 1, 1913.
JOHN HARRINGTON,	Term expires February 1, 1914.
F. H. LORD,	Term expires February 1, 1914.
H. O. HAMILTON,	Term expires February 1, 1915.
GEORGE B. NELSON,	Term expires February 1, 1915.

OFFICERS OF THE BOARD.

C. H. CROWNHART, President.
DUNCAN McGREGOR, Vice President.
WILLIAM KITTLE, Secretary.
ANDREW H. DAHL, State Treasurer.

STANDING COMMITTEES.

Executive,	The President, Regents MORRIS and HAMILTON.
Claims,	Regents KRONSHAGE, McGREGOR and NELSON.
Courses of Study and Graduating Classes,	Regents McGREGOR, YOUMANS, KRONSHAGE, CARY, HARRINGTON and HAMILTON.
Teachers' Institutes,	Regents CARY, YOUMANS and HORAN.
Inspection and Appropriation,	Regents HORAN, LORD, NELSON, MORRIS and CROWNHART.
Teachers,	Regents HARRINGTON, CARY and LORD.
Libraries,	Regents YOUMANS, McGREGOR and NELSON.

SCHOOLS IN OPERATION.

Platteville opened 1866.
Whitewater opened 1868.
Oshkosh opened 1871.
River Falls opened 1875.
Milwaukee opened 1885.
Stevens Point opened 1894.
Superior opened 1896.
La Crosse opened 1909.

Regular meetings in February and June at the Office of the Board in the Capitol.

PRESIDENT'S REPORT

His Excellency, JAMES O. DAVIDSON, *Governor:*

SIR:—I have the honor to submit, in accordance with law, my report for the biennial period ending August 31, 1910, as follows, to-wit:

During the past two years the Board has constructed a modern normal school at La Crosse and one at Milwaukee. These buildings are first class in every respect and set a new standard for school buildings in the state. A new building for the grades and the library is nearing completion at Whitewater. A dormitory for girls is nearly ready for occupancy at Superior. This is a fine building and specially adapted for a girls' home during attendance at school. Other material improvements include new boiler houses and fuel bunkers at Oshkosh and Stevens Point.

All of these buildings have been erected from special appropriations for that purpose by recent legislatures.

The Board has pursued the policy of maintaining all buildings in good condition and furnishing the same for efficient use.

There should be material improvements and repairs made at several of the schools in the immediate future. A special committee of the Board has been appointed to examine thoroly into the physical needs of the schools and to report to the Board in November next. When this report comes in the Board will make its report to your excellency and to the legislature in order that suitable legislation may be had.

Pursuant to an act of the legislature of 1909 the Board selected a site at Eau Claire for a new Normal School. This site consists of upwards of eight acres and is admirably located.

In accordance with the law passed in 1909, the Board of Regents of Normal Schools has established a Rural School Course in the four Normal Schools in La Crosse, Oshkosh, River Falls and Whitewater. This course is designed to prepare teachers for

the country schools. It is a distinct recognition of the importance of the rural school in the life of the state and of the necessity of improving those schools. What is most needed now is the creation of this course into a distinct department with the most competent head and instructional force that can be secured. This course should not be allowed to become the mere feeder to the other courses. It should be so organized and administered that the social, industrial and intellectual life of the country school district will always be the main point in view. If the legislature will make adequate provision for this course, the Board will do its best to organize and strengthen this department and to secure the best talent obtainable.

The Summer Schools have fully justified the extra expenditures made for them. During the summer of 1910, there were eleven of such schools running with an enrollment of 3,368. Of this number 1,971 stated that they intended to teach in the rural schools in 1910–1911. This shows that the Summer Schools are directly and strongly increasing the efficiency of the country schools. The cost of the eleven summer schools in 1910 was $14,975.86 more than the cost of the six Summer Schools in 1909. There will be an increased expense for Summer Schools in the future as these schools show increased popularity and attendance.

In order to maintain the Summer Schools the Board found it necessary to impose a tuition of five dollars per student. There is no more reason why tuition should be charged at the summer sessions than at other sessions. If tuition is to be abolished at the summer sessions legislative appropriation must be made to cover the expense.

The question of salaries for the teachers and employes of our normal schools has become of increasing importance. During the past ten years the cost of living has increased from 25 to 40% in the different items of expenditure. Our teachers are paid less than for like positions in Illinois, Minnesota, Michigan and other states. The result is that from time to time we are losing our most efficient teachers. Recently a special committee of the Board of Regents of Normal Schools made an investigation of the salaries and cost of living of 153 teachers, exclud-

ing the Presidents and Institute Conductors who are the highest paid persons in our normal school system. This investigation shows that 61 men in the normal department received on an average $1,684 annually and saved each year only an average of $216. The average salary of 62 women teachers in the normal department was $1,015 and the annual saving only $204. The average salary of 30 teachers in the training schools below the normal department was $933 and the annual saving only $147.

When it is remembered that a comparatively high standard of living is required of our teachers, that long preparation is demanded and that living expenses have advanced rapidly, it is believed that the people of the state will make a more liberal allowance for these teachers.

In February, 1910, the Board appointed a special committee of the Regents to make a thoro investigation of the physical and educational needs of all the normal schools. This committee has conducted phases of this investigation and will continue its work. As one result of this investigation, the Board called during the months of October, November and December, 1910, seven educational conferences of normal school teachers and city superintendents of schools to consider and report on every phase of normal school work for the purpose of making the normal school system the most efficient. These reports will be considered by the Committee of the Regents and brought before the Board in February, 1911. The Board will endeavor to improve in every way the normal school system.

The public schools are making demands on the Normals for teachers competent to teach commercial branches, domestic science and manual training. At present we are not prepared to train teachers in any of these subjects.

The time is at hand when the legislature should consider the policy of establishing a normal school specially equipped to train teachers along the lines suggested.

The subject of conserving the public health is now receiving more and more attention. Should not the Normal Schools provide for medical examination and physical training to meet the needs?

In accordance with Chapter 495, of the laws of 1909, the Board

employed an expert auditor in August and September, 1910, to make thoro examination of its accounts. This report will be placed in the hands of the Governor and members of the legislature. The Board will make every effort to improve its system of bookkeeping and classification of accounts suggested by the auditor. The examination disclosed no irregularity in the funds or bills of the Board.

The Normal Schools of the State are in a higher state of efficiency than ever before. Yet in many respects they are behind similar schools of other states.

We should give these schools the highest consideration. They are doing a splendid service in our educational system and are deserving of the confidence reposed in them by the legislature. Appropriations should be increased to meet the increased demands.

THE NORMAL SCHOOL FUND.

The management of this fund is placed by law in the hands of the Commissioners of Public Lands, to-wit: Secretary of State, State Treasurer and the Attorney General; and by courtesy of these officials, the Secretary of the Board Regents of Normal Schools secures monthly such data as enables him to keep a set of books from which the following facts are obtained. The State Treasurer is the custodian of the cash and bonds, and the Secretary of State keeps the records of special loans and loans to school districts, villages, towns, counties and cities.

The total fund, June 30, 1910, at the close of business was $1,957, 563.86 (an increase of $334 during the biennium), of which $700.05 was cash and the sum of $1,956,863.81 was in bonds and loans as follows, to-wit:

State certificates of indebtedness at 7 per cent.....	$515,700 00
Land contracts and individual loans, old law, 7 per cent	1,725 00
Bonds at 6 per cent.....	2,000 00
Bonds at 5 per cent.....	53,500 00
Bonds at 4½ per cent.....	30,000 00
Bonds at 4 per cent.....	12,200 00
Bonds at 3¾ per cent.....	20,000 00
Bonds at 3½ per cent.....	158,250 00
Special loans at 5 per cent.....	6,678 94
Special loans at 4 per cent.....	66,000 00

President's Report.

Special loans at 3½ per cent	815,227 01
School district loans at 3½ per cent	275,582 86
Total	$1,956,863 81
Cash in treasury at close of business June 30, 1910	700 05
Total Normal School Fund, July 1, 1910	$1,957,563 86

CERTIFICATES.

State certificate of indebtedness	$515,700 00

BONDS.

	(Per cent.)	
Antigo, city of	4	$12,200 00
Ashland, city of	5	22,000 00
Ashland, county of	5	25,000 00
Berlin, city of	3½	12,000 00
Cameron, village of	3½	1,500 00
Clinton, city of	5	5,500 00
Columbus, city hall	5	1,000 00
Glenwood, town of	6	2,000 00
Hudson, city of	3¾	20,000 00
La Crosse, county of	3½	95,000 00
Mauston, city of	3½	10,000 00
Merrill, city of	4½	30,000 00
Shawano, city of	3½	9,000 00
Stoughton, city of	3½	30,750 00
Total		$275,950 00

SPECIAL LOANS.

	(Per cent.)	
Alma Center, village of	3½	$8,500 00
Amery, village of	3½	300 00
Arpin, town of	3½	5,000 00
Arpin, town of	3½	3,000 00
Argyle, village of	3½	3,440 00
Barron, city of	3½	6,766 64
Brule, town of, Bd. of School Directors	3½	2,333 33
Blanchardville, village of	3½	1,950 00
Black River Falls, city of	3½	5,500 00
Black River Falls, city of	3½	5,000 00
Birnamwood, village of	3½	6,500 00
Bayfield, town of, Bd. of School Directors	3½	4,200 00
Blanchardville, village of	3½	2,400 00
Black River Falls, city of	3½	9,000 00
Bloomer, village of	3½	13,000 00
Bayfield, town of	3½	7,500 00
Bergen, town of	3½	2,400 00
Black River Falls, city of	3½	2,000 00
Cary, town of	3½	600 00
Chippewa, county of	5	3,578 94
Colby, city of	3½	7,800 00

Crandon, town of, Bd. of School Directors....	3½	4,000 00
Cashton, village of.....	3½	14,250 00
Cumberland, city of.....	3½	23,611 11
Dane, county of.....	3½	15,000 00
Door, county of.....	3½	27,000 00
Eau Claire, county of.....	3½	16,666 64
Eau Claire, county of.....	3½	8,333 32
Eau Claire, county of.....	3½	12,500 10
Eau Claire, county of.....	3½	25,000 00
Eau Claire, county of.....	3½	10,000 00
Eau Claire, county of.....	3½	6,000 00
Eau Claire, city of.....	3½	19,500 00
Elcho, town of, Bd. of School Directors.....	3½	250 00
Elroy, city of.....	3½	8,500 00
Emerson, town of.....	3½	960 00
Finley, town of.....	3½	500 00
Flambeau, town of.....	3½	1,000 00
Fond du Lac, city of.....	4	6,000 00
Galesville, village of.....	3½	2,000 00
Gagen, town of, and town of Piehl, Bd. of School Directors	3½	2,000 00
Grand Rapids, city of, Board of Education...	3½	55,000 00
Grand Rapids, city of, Board of Education...	3½	10,000 00
Grant, county of.....	3½	24,000 00
Hazel Green, village of.....	3½	4,200 00
Hiles, town of.....	3½	3,000 00
Hixon, town of.....	3½	5,000 00
Iola, village of.....	3½	1,571 42
Iron River, town of.....	3½	400 00
Jacobs, town of.....	3½	3,000 00
LaFarge, village of.....	3½	15,000 00
Light Horse Squadron, Milwaukee.....	4	30,000 00
Madison, city of.....	3½	17,500 00
Madison, city of, Board of Education.....	3½	35,000 00
Madison, city of.....	3½	25,000 00
Madison, city of, Board of Education.....	3½	9,000 00
Marinette, city of.....	3½	7,000 00
Marinette, city of.....	3½	2,000 00
Marinette, county of.....	3½	16,000 00
Marshall, town of, Board of School Directors	3½	4,000 00
Menomonie, city of.....	3½	30,000 00
Menomonie, city of.....	4	25,000 00
Monico, town of, Board of School Directors...	3½	3,150 00
Mondovi, town of.....	3½	4,177 78
Mondovi, city of.....	3½	2,583 33
Navarino, town of.....	3½	1,200 00
Newbold, town of.....	3½	1,000 00
New London, city of.....	5	1,000 00
New Richmond, city of.....	3½	6,000 00
Portage, city of.....	3½	4,500 00
Prairie du Chien, city of.....	4	5,000 00
Richmond and Westcott, towns of.....	5	1,500 00
Richland, county of.....	3½	19,000 00
Richland, county of.....	3½	10,000 00
Shawano, county of.....	3½	5,000 00

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Shell Lake, town of	3½	8,000 00
Sturgeon Bay, city of	3½	40,000 00
State Line, town of, Board of School Directors	3½	500 00
Solon Springs, town of, Board of School Directors	3½	2,400 00
Stanley, city of, Board of Education	3½	18,000 00
Thorp, village of	3½	4,000 00
Vernon County, Board of Supervisors	3½	16,000 00
Waubeno, town of, Board of School Directors	3½	3,750 00
Waubeno, town of, Board of School Directors	3½	8,000 00
Wausaukee, town of, Board of School Directors	3½	1,000 00
Washington, town of	3½	2,000 00
Washington, town of	3½	3,500 00
Washburn, county of	3½	12,000 00
Waupaca, city of	3½	10,000 00
Waupaca, county of	3½	37,350 00
Washburn, county of	3½	15,750 00
Wausau, city of	3½	12,100 00
Whitefish Bay, village of	5	600 00
Wonewoc, village of	3½	3,333 34
Total		$887,905 95

LOANS TO SCHOOL DISTRICTS.

County.	Town.	District.	Rate.	Loans.
Adams	Easton	4	3½	$350 00
Barron	Stanley, village of Cameron	Jt. 1	3½	4,000 00
Barron	Barron, Maple Grove and Stanley	Jt. 3	3½	400 00
Burnett	Jackson	5	3½	500 00
Calumet	Chilton, city and town of	Jt. 1	3½	5,333 35
Chippewa	Village of Cadott	7	3½	1,500 00
Chippewa & Barron	Dovie, Auburn and vil. of New Auburn	Jt. 11	3½	3,300 00
Clark	Washburn	5	3½	300 00
Crawford	Seneca	H. S.	3½	1,500 00
Dane	Springdale, Blue Mounds and village of Mt. Horeb	Jt. 7	3½	500 00
Dane	Stoughton and Dunkirk	Jt. 3	3½	14,000 00
Dodge	Hubbard, Oak Grove and city of Horicon	Jt. 1	3½	13,933 36
Dodge	Town and village of Theresa	Jt. 3	3½	6,600 00
Door	Sturgeon Bay and Sevastopol	Jt. 1	3½	666 70
Dunn	Stanton	2	3½	100 00
Eau Claire	Seymour and Lafayette	Jt. 3	3½	200 00
Grant	Platteville, city and town of	Jt. 4	3½	10,000 00
Grant	Mt. Ida	3	3½	540 00
Grant	Platteville, city and town of	Jt. 4	3½	5,500 00
Green Lake	Mackford and village of Markesan	Jt. 3	3½	12,000 00
Jackson	Melrose	11	3½	750 00
Jackson	Alma and village of Merrillan	Jt. 5	3½	1,250 00
Kewaunee	City of Algoma and Ahnapee	Jt. 1	3½	8,800 00
La Crosse	Holland and Onalaska	Jt. 3	3½	1,666 70
Langlade	Neva	5	3½	400 00
Marinette	Athelstone	1	3½	400 00
Milwaukee	City of West Allis	1	3½	2,750 00
Milwaukee	City of Wauwatosa	7	3½	500 00
Milwaukee	Lake	5	3½	4,400 00
Monroe	Lincoln	8	3½	586 68
Outagamie	City of Appleton	1	3½	20,000 00
Ozaukee	Grafton, town and village of	Jt. 1	3½	7,333 36
Polk	West Sweden and village of Frederick	Jt. 3	3½	750 00
Polk	Clam Falls	3	3½	500 00
Portage	Alban	5	3½	750 00
Portage	Carson	10	3½	340 00
Price	Lake	4	3½	140 00
Richland	Orion	4	3½	600 00
Rock	Milton	5	3½	6,600 04
St. Croix	Glenwood	4	3½	714 28
Sauk & Columbia	Town and village of Merrimac and West Point	Jt. 5	3½	2,000 00
Sheboygan	Sheboygan	2	3½	900 00
Taylor	Holway	8	3½	300 00
Trempealeau	Ettrick	3	3½	400 00
Walworth	Geneva, Linn, Lyons and city of Lake Geneva	Jt. 1	3½	18,000 00
Washburn	Town and village of Spooner	Jt. 1	3½	10,000 00
Washburn	Long Lake	6	3½	100 00
Washburn	Stinette	4	3½	420 00
Waupaca & Shawano	Village of Marion, town of Dupont and town of Grant	Jt. 3	3½	5,541 69
Waushara	Warren	1	3½	2,666 70
Dane	Burke	2	3½	2,000 90
Waupaca	Matteson	1	3½	2,000 00
St. Croix	Somerset	3	3½	3,000 00
Richland	Bloom and Forest	Jt. 1	3½	2,000 00
Sheboygan & Manitowoc	Rhine and Schleswig	Jt. 3	3½	1,500 00
Grant	Wyalusing and Bloomington	Jt. 9	3½	2,100 00
Clark	Hixon and village of Withee	Jt. 2	3½	1,500 00
Langlade	Ackley	3	3½	2,000 00
Dunn	New Haven and Tiffany	Jt. 6	3½	1,200 00
Polk	Luek	5	3½	1,200 00
Clark	City and town of Colby	Jt. 1	3½	12,000 00
Grant	Town and vlilage of Cassville	Jt. 1	3½	18,000 00
Marathon & Clark	Unity, Brighton and village of Unity	Jt. 1	3½	12,000 00
Milwaukee	Wauwatosa	8	3½	25,000 00

President's Report.

LOANS TO SCHOOL DISTRICTS—Continued.

County.	Town.	District.	Rate.	Loans.
St. Croix	Ceylon	2	3½	800 00
Brown	Pittsfield	1	3½	2,000 00
Door	Liberty Grove	7	3½	2,500 00
Price	Kennan and Georgetown	Jt. 3	3½	1,000 00
Taylor	Aurora	5	3½	1,600 00
Monroe	New Lyme	4	3½	600 00
Dunn	Colfax	2	3½	800 00
Total				275,582 86

LAND CONTRACTS OUTSTANDING ON JULY 1, 1910. INTEREST AT SEVEN PER CENT, PAYABLE FROM JANUARY 1, TO DECEMBER 31, OF EACH YEAR.

Date of sale.	To whom sold.	County.	Description.	S.	T.	R.	Acres.	Amount due July 1, 1910.
Sept. 25, 1857	A. Isacson	Adams	ne ne	26	17	5	40	$45 00
Sept. 25, 1857	A. Isacson	Adams	nw ne	26	17	5	40	45 00
Dec. 4, 1887	Geo. B. Burrows	Adams	nw se	3	14	6	40	26 00
Feb. 21, 1857	A. Boorman	Calumet	nw ne	36	18	20	40	20 00
May 31, 1861	Ole Helgeson	Dane	ne ne	12	7	11	40	77 00
Mar. 11, 1891	Robert Hintz	Oconto	nw sw	14	28	17	33.7	59 00
Dec. 18, 1891	August Hintz	Oconto	ne nw	15	28	17	40	48 00
Dec. 28, 1891	Robert Hintz	Oconto	ne sw	15	28	17	40	54 00
Dec. 10, 1891	Robert Hintz	Oconto	se sw	15	28	17	40	54 00
Dec. 20, 1892	E. P. Sherry	Oconto	ne ne	29	28	17	40	45 00
Dec. 20, 1892	E. P. Sherry	Oconto	nw nw	32	28	17	40	45 00
July 6, 1864	Rich Nugent	Portage	se nw	28	25	8	40	20 00
May 13, 1885	Eugene Taplin	Waushara	se sw	36	19	10	40	37 00
Total							513.7	$575 00

LOANS TO INDIVIDUALS FROM NORMAL SCHOOL FUND OUTSTANDING JULY 1, 1910.

Date of loan.	Name.	County.	Security.	Rate per ct.	Bal. due.
Sept. 2, 1857	Jos. Langworthy	Juneau	Lots 4 and 10, block 2, of Williams Addition to Mauston	7	$300 00
Dec. 29, 1857	Geo. W. Emery	Manitowoc	Lots 1 and 2, block 57, city of Manitowoc	7	450 00
June 19, 1849	C. S. Wright	Racine	S. ½ of lot 2, block 12, city of Racine	7	400 00
Total					$1,150 00

SUMMARY.

State certificate of indebtedness	$515,700 00
Bonds	275,950 00
Special loans	887,905 95
Loans to school districts	275,582 86
Three individual loans	1,150 00
Loans on land contracts	575 00
Cash in treasury on July 1, 1910	700 05
Total Normal School Fund	$1,957,563 86

THE NORMAL SCHOOL FUND INCOME.

The Normal School Fund Income for the year ending June 30, 1910, was as follows:

1. Permanent Annual Tax Levy	$340,000 00
2. Interest on the Normal School Fund	88,865 99
3. Collections at the eight normal schools, regular sessions	27,205 69
4. Collections at the six summer schools in 1909	8,719 32
5. Annual appropriation by the state for Institutes	7,000 00
Total	$471,791 00

The following shows the sources of interest on the normal school fund for the fiscal year ending June 30, 1910:

Interest on land contracts	$133 35
Interest on bank deposits	1,941 68
Interest on school district loans	7,098 94
Interest on certificates of indebtedness	36,099 00
Interest on loan to Light Horse Squadron	1,200 00
Interest on special loans	30,636 85
Interest on bonds	11,756 17
Total	$88,865 99

My predecessor on August 31, 1909, reported the rate of earning to be $89,137.06 per year. The rate of earning on July 1, 1910, was $88,865.99 per year.

"I follow a long established custom of reporting the expenditures from the fund during the two preceding school years, ending with the disbursements made at the annual meeting in June, since the spirit of the law requiring the report seems not to be violated, and every rational purpose of the report seems far better served by so doing."

During the biennial period, July 1, 1908, to June 30, 1910,

inclusive, as shown by the statement following the Treasurer's Report, there was disbursed a total of $1,437,371.35, being $457,-865.68 more than durng the preceding biennium. During the period July 1, 1906, to June 30, 1908, there was expended a total of $291,799.67 for building and the purchase of land; while during the two years ending June 30, 1910, the amount expended for building and land was $601,550.31. Deducting this amount from the total expenditures, there remains a total of $835,821.04, which was expended for reguar normal school expenses from July 1, 1908, to June 30, 1910, inclusive. The current expenses for the preceding biennium amounted to $687,706.

This increase of $148,115.04 during the last biennium has been due to increased expenses caused by building operations, increases in salaries, to the improvements in buildings and grounds, to the maintenance of the summer school system and to the cost of maintaining the new normal school at La Crosse.

The total disbursements from July 1, 1908, to June 30, 1910, are shown in detail in the following reports:

Proceedings of the Board, February 3–5, 1909	$510,388	88
Proceedings of the Board, June 29–July 1, 1909	255,676	75
Proceedings of the Board, February 2–3, 1910	383,734	98
Proceedings of the Board, June 29–30, 1910	287,570	74
State Insurance payments, 1908–1909	3,047	22
State Insurance payments, 1909–1910	3,330	72
Audit of June 26, 1908 paid by the treasurer after July 1, 1908	7,906	32
Excess interest refunded by treasurer	1	96
	$1,451,657	57
Audit of June 29–30, 1910, paid by the treasurer after July 1, 1910	2,473	61
Total disbursements	$1,449,183	96

NORMAL SCHOOL LANDS UNSOLD JULY 1, 1910.

Description.	S.	T.	East. R.	Acres.	Appraised value.	County.
Lot 9, in block 19 in W. M. Dennis' addition to the city of Watertown	.....	.....	.....	.....	$300 00	Dodge.
sw se	34	22	5	40	200 00	Jackson.
se nw	30	18	6	40	90 00	Adams.
ne ne	12	27	16	40	240 00	Shawano.
ne se	30	28	17	40	60 00	Oconto.
sw se	30	28	17	40	42 00	Oconto.
Lot 3	31	28	17	36.6	100 00	Oconto.
se se	31	28	17	40	80 00	Oconto.
Lot 3, Block 251, Village of Manitowoc, Lot 4, Block 251, Village of Manitowoc. Lot 5, Block 251, Village of Manitowoc. Lot 8, Block 251, Village of Manitowoc.						
Total	.....	.....	.....	276.6	$812 00	

LIBRARIES.

The following tables show the receipts and disbursements for the text-book and reference book libraries for the two years ending June 30, 1910:

RECEIPTS.

	Items.	1908-1909.	1909-1910.	Totals.
La Crosse	Book revenue	.....	$1,011 40	$1,011 40
Milwaukee	Book revenue	$2,493 50	2,607 14	5,100 64
Oshkosh	Book revenue	3,116 69	3,141 09	6,257 78
Platteville	Book revenue	1,536 50	1,589 90	3,126 40
River Falls	Book revenue	1,515 39	1,681 10	3,196 49
Stevens Point	Book revenue	1,968 88	1,869 86	3,838 74
Superior	Book revenue	2,004 02	2,133 80	4,137 82
Whitewater	Book revenue	1,681 61	1,505 23	3,186 84
Totals	.....	$14,316 59	$15,539 52	$29,856 11

President's Report.

DISBURSEMENTS.

	BOOKS 1908-9.		BOOKS 1909-10.		Totals.
	Text.	Reference.	Text.	Reference.	
La Crosse			$1,916 85	$4,058 93	$5,975 78
Milwaukee	$548 21	$1,843 21	1,265 16	1,287 42	4,944 00
Oshkosh	1,086 44	684 04	1,224 19	806 00	3,800 67
Platteville	574 58	724 63	622 41	783 35	2,704 97
River Falls	602 99	738 79	1,072 14	515 26	2,929 18
Stevens Point	1,237 75	725 38	939 11	891 98	3,794 22
Superior	790 18	1,023 29	922 22	1,149 53	3,885 22
Whitewater	825 61	513 22	791 71	279 92	2,410 46
Totals	$5,665 76	$6,252 56	$8,753 79	$9,772 39	$30,444 50

It appears from the foregoing tables that the total disbursements for the two years were $588.39 more than the receipts. This was due to the cost of the new library at the La Crosse Normal School. Of the $5,975.78 expended for the library at the La Crosse Normal School, $4,964.38 was charged to the building account for that school. Hence, the disbursements from the book revenue proper were $25,480.12. The book revenue was $29,856.11. Hence, the libraries are not only self-supporting, but are a source of income to the Board, the book revenue exceeding the disbursements, which are properly chargeable against such revenue, by $4,375.99.

STUDENTS.

The total enrollment during the past two years was 806 more than during the preceding biennium. The total enrollment in the Normal Department proper was 412 more than during the preceding biennium.

The total number of graduates was 111 more than during the preceding two years. There were 168 more from the advanced course than during the preceding biennium.

President's Report.

TOTAL ENROLLMENT OF STUDENTS.

Schools 1908-9.	Normal.	Preparatory.	Grammar.	Intermediate.	Primary and Kindergarten.	Totals.
Milwaukee	503	.....	43	43	68	657
Oshkosh	656	.....	116	66	174	1,012
Platteville	300	.....	65	48	107	520
River Falls	322	13	52	43	53	483
Stevens Point	357	.....	90	50	148	645
Superior	423	.. ..	46	58	114	641
Whitewater	328	15	43	43	123	552
Totals	2,889	28	455	351	787	4,510
1909-10.						
La Crosse	275	.....	42	41	71	429
Milwaukee	510	.....	74	71	178	833
Oshkosh	654	.....	99	56	152	961
Platteville	287	.....	64	57	110	518
River Falls	332	5	49	54	51	491
Stevens Point	368	7	96	41	148	660
Superior	434	12	48	85	107	686
Whitewater	278	5	44	49	109	485
Totals	3,138	29	516	454	926	5,063

NUMBER OF GRADUATES IN TWO YEARS.

YEAR.	1908-1909.		1909-1910.		TOTALS.		
Course.	Elementary.	Advanced.	Elementary.	Advanced.	Elementary.	Advanced.	Both courses.
La Crosse	.....	.....	3	9	3	9	12
Milwaukee	*	185	*	208	*	393	393
Oshkosh	63	117	21	123	84	240	324
Platteville	2	67	0	55	2	122	124
River Falls	14	33	1	42	15	75	90
Stevens Point	41	50	31	73	72	123	195
Superior	25	53	8	75	33	128	161
Whitewater	40	62	14	60	54	122	176
Totals	185	567	78	645	263	1,212	1,475

*The Milwaukee Normal has no elementary course.

President's Report.

TOTAL NUMBER OF GRADUATES. (NONE COUNTED TWICE.)

SCHOOLS.	When opened.	COURSE.		Both.
		Elementary.	Advanced.	
La Crosse	1909	3	9	12
Milwaukee	1885	*	2,595	2,595
Oshkosh	1871	925	1,371	2,296
Platteville	1866	202	1,160	1,362
River Falls	1875	429	473	902
Stevens Point	1894	555	549	1,104
Superior	1896	181	474	655
Whitewater	1868	758	951	1,709
Totals	.....	3,053	7,582	10,635

*The Milwaukee Normal has no elementary course.

The following table shows the number of teachers and employes for the year 1909–1910:

NUMBER OF TEACHERS AND EMPLOYES.

NORMAL.	TEACHERS IN NORMAL DEPT.		Teachers in training schools	Librarians and assistants.	Clerks.	Janitors and assistants.	Engineers and assistants.	Total.
	Men.	Women.						
La Crosse	10	5	4	1	1	3	1	25
Milwaukee	13	13	7	2	2	2	1	40
Oshkosh	14	18	6	2	2	3	1	46
Platteville	10	7	5	1	1	1	1	26
River Falls	9	9	3	1	1	.....	1	24
Stevens Point	12	7	5	2	1	1	1	29
Superior	9	9	6	2	1	2	1	30
Whitewater	8	11	5	2	1	2	1	30
Totals	85	79	41	13	10	'14	8	250

Respectfully submitted,

C. H. CROWNHART,

President.

Treasurer's Report.

The following is the biennial report of the treasurer of the Board:

NORMAL SCHOOL FUND INCOME RECEIPTS.	*1909.*	*1910.*
Interest on land certificates	$31 12	$105 35
Interest on loans	38,441 63	39,173 79
Interest on bonds	12,777 31	11,546 17
Interest on State Deposits	3,133 42	1,941 68
Interest on Certificates of Indebtedness	36,099 00	36,099 00
General fund	384,500 00	297,200 00
Secretary William Kittle	273 00	704 76
Normal schools	30,762 49	35,926 40
State tax	230,000 00	340 000 00
Cancelled drafts	40 80	.....
Total	$736,058 77	$782,697 15
NORMAL SCHOOL FUND INCOME DISBURSEMENTS.	*1909.*	*1910.*
State insurance	$3,047 22	$3,330 72
Normal schools and institutes	755,758 87	687,045 19
Excess interest refunded	1 96	.....
Total	$758,808 05	$690,375 91
RECAPITULATION.		
Balance on hand June 30, 1908	$91,599 39	.....
Receipts for two years	1,498,755 92	.....
Disbursements for two years	.....	$1,449,183 96
Balance June 30, 1910	.....	141,171 35
Total	$1,590,355 31	$1,590,355 31

From July 1, 1908, to July 1, 1910.

NORMAL SCHOOL FUND RECEIPTS.	*1909.*	*1910.*
Payment on land certificates	$270 00	.....
Payment on land sales	400 00	$36 00
Payment on land loans	106,293 76	97,849 85
Payment on bonds	23,350 00	19,350 00
Total	$130,313 76	$117,235 85
NORMAL SCHOOL FUND DISBURSEMENTS.	*1909.*	*1910.*
Loans	$101,800 00	$146,200 00
RECAPITULATION.		
Balance on hand June 30, 1909	$1,150 44	.....
Receipts for two years	247,549 61	.....
Disbursements for two years	.....	$248,000 00
Balance on hand June 30, 1910	.....	700 05
Total	$248,700 05	$248,700 05

A. H. DAHL,
State Treasurer.

APPENDIX A.

SCHEDULE OF CLASSIFIED EXPENDITURES FOR THE ANNUAL PERIOD ENDING JULY 1, 1909.

Items.	La Crosse.	Milwaukee.	Oshkosh.	Platteville.	River Falls.	Stevens Point.	Superior.	Whitewater.	Totals.
Apparatus and cabinet	.....	$732 98	$946 91	$1,391 21	$337 63	$587 85	$216 59	$161 39	$4,374 56
Building	$148,868 91	161,738 04	41,868 95	7,348 32	285 00	2,192 00	24,413 41	90 20	386,804 83
Fuel	115 37	1,608 92	4,063 23	3,151 58	1,664 02	2,940 45	2,403 09	2,071 41	18,018 07
Furniture	32 06	354 90	2,031 81	404 01	320 60	1,414 26	562 95	674 33	5,794 92
Light	.....	339 54	444 61	342 82	260 06	520 07	371 57	255 57	2,534 24
Miscellaneous	275 90	1,394 53	2,319 15	1,546 34	1,404 06	2,089 09	2,073 58	1,669 33	12,771 98
Printing	55 00	470 20	285 80	341 95	326 98	602 50	444 25	428 50	2,955 18
Repairs	.....	531 79	2,734 91	154 42	2,014 74	3,752 57	2,231 46	2,111 62	13,531 51
Reference books	.....	1,843 21	684 04	724 63	738 79	725 38	1,023 29	513 22	6,252 56
Salaries	1,110 00	46,284 85	56,909 40	34,518 16	30,473 50	37,092 29	35,407 31	36,909 50	278,705 01
Stationery	31 24	487 29	745 41	158 00	423 07	298 06	467 38	324 00	2,934 45
Text books	.....	548 21	1,086 44	574 58	602 99	1,237 75	790 18	825 61	5,665 76
Water rent	.....	236 11	330 29	264 56	125 00	400 00	531 49	400 00	2,287 45
Totals	$150,488 48	216,570 57	114,450 95	$50,920 58	$38,976 44	$53,852 27	$70,936 55	$46,434 68	$742,630 52

Expenses of Committees, of the Secretary's office, of the Board, for general purposes, and per diem of members	$7,801 59	
Salary of the Secretary for one year	2,000 00	$9,801 59
Cost of Teachers' Institutes:		
For incidentals	.....	
For conductor's expenses	3,092 52	
For conductor's salaries	10,541 00	13,633 52
Total disbursements from July 1, 1908, to July 1, 1909, inclusive	.....	$766,065 63

APPENDIX A.

SCHEDULE OF CLASSIFIED DISBURSEMENTS FOR THE ANNUAL PERIOD ENDING JUNE 30, 1910.

Items.	La Crosse.	Milwaukee.	Oshkosh.	Platteville.	River Falls.	Stevens Point.	Superior.	Whitewater.	Totals.
Apparatus and cabinet	$3,395 57	$1,009 56	$1,049 15	$1,395 28	$484 45	$737 80	$248 41	$383 81	$8,704 03
Building	47,098 00	97,761 10	16,437 83	2,200 00	.....	8,441 15	22,237 40	20,570 00	214,745 48
Fuel	1,453 72	1,989 67	3,909 17	2,594 77	1,537 05	2,794 46	1,849 00	1,632 45	17,760 29
Furniture	10,667 38	5,826 50	532 35	483 09	573 44	390 95	1,203 76	912 53	20,590 00
Light	1,124 23	1,322 03	567 22	252 52	326 35	667 66	344 35	329 63	4,933 99
Miscellaneous	3,006 96	2,831 95	2,685 75	1,347 43	1,592 25	2,020 25	2,279 90	1,388 60	17,153 09
Printing	429 68	145 00	82 35	103 80	80 65	124 25	491 80	617 00	2,074 53
Repairs	265 82	400 58	3,004 51	817 44	1,416 12	1,350 53	805 95	744 70	8,805 65
Reference books	4,058 93	1,287 42	806 00	783 35	515 26	891 98	1,149 53	279 92	9,772 39
Salaries	31,637 23	50,936 25	59,864 12	37,653 77	32,988 45	38,084 55	39,366 88	38,261 50	328,792 75
Stationery	507 95	580 57	920 58	422 66	727 39	94 00	401 26	390 52	4,044 93
Text books	1,916 85	1,265 16	1,224 19	622 41	1,072 14	939 11	922 22	791 71	8,753 79
Water rent	55 37	282 46	191 67	122 15	125 00	400 00	542 88	400 00	2,119 53
Totals	$105,617 69	$165,638 25	$91,274 89	$48,798 67	$41,438 55	$56,936 69	$71,843 34	$66,702 37	$648,250 45

Expenses of Committees, of the Secretary's office, of the Board, for general purposes, and per diem of members	$7,106 82	
Salary of the Secretary for one year	2,500 00	$9,606 82
Cost of Teachers' Institutes:		
For incidentals	255 34	
For conductors' expenses	3,015 11	
For conductors' salaries	10,178 00	13,448 45
Total disbursements from July 2, 1909, to June 30, 1910, inclusive	.....	$671,305 72

La Crosse Normal School.

APPENDIX B.

Reports of Presidents of Normal Schools.

LA CROSSE.

HON. C. H. CROWNHART,
President Board of Normal School Regents.
Madison, Wis.

DEAR SIR:—I have the honor of submitting the following report for the State Normal School at La Crosse for the last half of the biennial period ending August 31st, 1910.

THE OPENING OF THE SCHOOL.

With the building incomplete and unfurnished, the school began its work September 7th, 1909, enrolling one hundred seventy-six students the first day, and two hundred seventy-five the first year. To this may be added the two hundred twenty-two enrolled in the training school and two hundred seventeen in the Summer School, making a grand total of seven hundred fourteen. Even while recognizing that a school's worth and enrollment may vary in an inverse ratio, this large attendance the first year has been a source of satisfaction. Every indication points to a reasonable growth in numbers next year.

CHARACTER OF THE STUDENT BODY.

Normal Schools usually attract a body of young men and women of industry, purpose and good habits, but the students enrolled with us this past year are especially deserving of mention. A larger percentage of splendid young men and women who either brought or quickly caught the spirit of the school, I have never known. Particularly gratifying was it to number so many high school graduates among the student body, the enrollment from this class reaching one hundred sixteen.

THE FACULTY.

The cooperation and loyalty of the faculty have been most gratifying. Coming from so many quarters, with such diversity of training and experience, they could not have been expected to unify in spirit and purpose to a larger degree within a period of years. One of the factors instrumental in creating a common professional spirit was the successful series of faculty meetings held almost weekly throughout the whole year. In these meetings there was full opportunity for a free discus-

La Crosse Normal School.

sion of large problems of educational interest, as well as those having to do with the details of instruction and management from term to term.

THE OUTLOOK.

With every member of the first faculty retained, with two new members added, with the building complete, and a good beginning made towards adequate equipment, with a large graduating class assured for next year, and with the prestige that comes from one year of successful work, the school looks hopefully toward the future, glad for the privilege of helping in the solution of the state's unending educational problems.

THE NEEDS OF THE SCHOOL.

The school's pressing needs are special appropriations that will provide three things:

First, a better equipment of the library and laboratories; second, improvement of the lawn by covering its surface of sand with clay and loam to make grass, trees and shrubbery possible around the building; and third, a dormitory for women. The latter is especially needed, because suitable rooms are not being offered by the citizens in numbers adequate to our needs. If the school's growth and influence are not already lessened by the difficulty in finding rooming and boarding places near it, this result will surely come unless provided for by the building of a dormitory.

Respectfully submitted,

F. A. COTTON.

August 31, 1910.

Milwaukee Normal School.

MILWAUKEE.

C. H. CROWNHART,
President Board of Regents of Normal Schools.

DEAR SIR:—I have the honor of hereby submitting my report for the State Normal School at Milwaukee for the biennial period closing June 30, 1910.

ATTENDANCE.

During the period covered by this report, there has been a gradual increase in attendance. The total enrollment in the normal department for the year closing June 30, 1908 was 485. The attendance for the year closing June 30, 1910 was 510, showing an increase in two years of 25 students. The attendance in the training school has increased more materially. For the year 1908 attendance in the training school was 224 and for the year closing June 30, 1910 the attendance was 324. The total attendance for the year closing June 30, 1908 was 709 and the total attendance for the year closing June 30, 1910 was 834. This increase in the training school is due to the change of the location of the school from the west to the east side of the city.

The most important feature of the period covered by this report is the moving of the school from the old location on the west side of the city where it was originally established in 1885, to its new location on the east side. The new site contains about 11½ acres, beautifully located in an attractive and growing section of the city. The new building has proved satisfactory in every particular. The board is to be congratulated on the character of its construction. There is every evidence that it is most substantially built. In every respect the building shows careful and conscientious work on the part of the architect and contractors. The building has proved admirably suited to its purpose and is one of the most modern school buildings in the West.

During the biennial period just closed, 393 graduates have received diplomas from the school. With rare exceptions, these graduates have gone directly into the schools of Wisconsin and are making the Normal School system effective in advancing the educational interests of the state. The character of the students during the past two years has been, so far as purpose and devotion to duties are concerned, all that can be desired. The character of their preparation gives evidence that the high schools of Wisconsin are year by year improving in the character of the work they do.

FUTURE NEEDS.

Concerning the future of the school, there are two matters worthy of careful consideration.

The first is an increase in the salaries of the teachers. It is everywhere commented upon that the last few years have witnessed a decided increase in the cost of living. It is estimated that in ten years the cost of living has increased at least 35%. While there has been some increase in salaries during this time, the increase by no means measures the advance in the cost of living. The value of a system of schools lies in its teachers. A conservative educator has said that 85 percent of the value of the school lies in the teacher. To this I heartily subscribe. To get good teachers and to keep them in a contented frame of mind which is necessary to good work, adequate salaries must be

Milwaukee Normal School.

paid. I sincerely hope that the next legislature may find means whereby a decided increase in the annual income of the Normal School may be granted that the teachers may be more adequately paid.

The second matter of importance is the question of a dormitory for the young women of the school. One-half of the students attending the Milwaukee Normal School, come from outside of Milwaukee County. During the year closing June 1910, fifty-two Wisconsin counties and five states besides Wisconsin were represented by students. Approximately 300 young women have to secure rooming and boarding places in private families. This is a most unfortunate situation. While it is not especially difficult to get fairly satisfactory rooms, it is very difficult to get satisfactory boarding places. The dormitory system has always existed in the East. No eastern state would think of putting up a Normal school without a dormitory to care for its young women students. The West has begun to move in the same direction. Illinois, Iowa, Missouri, Minnesota and Wisconsin have already made a beginning. The dormitory makes it possible to develop a social life among the students of the school which will be both educative and refining. The campus at Milwaukee is sufficiently ample for the location of a dormitory and it is to be very greatly hoped that the legislature will make an appropriation for the erection of such a building.

Respectfully submitted,

CHAS. MCKENNY.

August 31, 1910.

Oshkosh Normal School.

OSHKOSH.

HON. C. H. CROWNHART,
President Board of Regents of Normal Schools.

DEAR SIR:—I have the honor of submitting, herewith, the biennial report of the State Normal School at Oshkosh, for the two years ending August 31, 1910.

BUILDINGS AND GROUNDS.

The gymnasium, in process of construction at the last biennial report, was finished in January 1909, and has proved to be admirably suited to our needs. Apparatus has just been ordered for the floor work of pupils. The new power house, authorized by the Legislature at its session in 1909, is nearing completion. The old building that has served to house the boilers since 1888 should be replaced by a new structure that would give an auditorium in which all of the students of the school could be comfortably seated. The original building, erected by the city of Oshkosh in 1869–1871, should also soon be replaced by a modern building. During the biennium just closed, there has been considerable work in grading done on the grounds, and also considerable painting and decorating within the building. Those who are acquainted with the building understand full well that the process of rebuilding will, under the most favorable circumstances, be almost constant for the next ten years. There is the greatest need, also, for additional land and dormitories, especially, for the young women.

ATTENDANCE.

The total enrollment in the normal department for the year 1908–09 was 656; for 1909–10, 650. The counties represented for these years were respectively 53 and 49,—thus showing that additional normal schools and county training schools have not operated to reduce the territory from which students come, or their number. The average quarterly enrollment during 1908–09 was 505; in 1909–10, it was 540. About one-half of those in attendance are high school graduates. During the preceding biennium, 207 diplomas were issued, while during the current one, 240 were issued. This indicates that the school is growing at the top. The same thing may be clearly shown in another way. Ten years ago (1899–00), the total number of Juniors and Seniors enrolled was 288; this year (1909–10), the number reached 404. The diplomas issued in 1899–00 were 70 as against 123 issued in 1909–10.

RELATION OF THE NORMAL SCHOOL OUTPUT TO THE SCHOOLS OF THE STATE.

There are a few schools still willing to accept graduates of the elementary course as teachers, but most school boards desire graduates of the diploma courses. Many city boards will not consider a candidate who is not a graduate with teaching experience after graduation. Other city boards will consider only those candidates who have had experience previous to graduation. The graduate most difficult to secure a position for is the inexperienced high school graduate. These facts, taken collectively, mean that the public demand is, in many cases, higher than the requirement for graduation from the

normal schools. This public demand raises the question of the extension of the required courses in the normal schools of the state.

The preparation of teachers for the high schools of the state is not adequately provided for in Wisconsin. The normal schools cannot, with two years' work beyond the high school, meet the requirements of any but the smaller high schools. The non-state colleges have no facilities for practice teaching and the university has only very limited opportunities in this direction. Superintendents and high school principals are substantially agreed that the best high school teachers are those who have had normal school work and have then graduated from college or university. At present, however, not nearly enough normal school graduates go on to college to meet the demand for high school teachers. The thing to be accomplished is to get normal school graduates to acquire the scholarship which college graduation implies. Whether this can be done by the colleges' crediting normal school work is not, at present, affirmatively proved. Whether it can be done by a two-year extension of normal school courses is untried in Wisconsin.

In fact, the standardized normal school courses are now being subjected to a friendly, yet searching, criticism from which great benefit will be derived. One point of this criticism is that no normal school in Wisconsin is preparing young people to teach what is called industrial education. Some adequate provision, in one normal school, should be made right away. A four year course for high school graduates, with strong instructors and good equipment, could offer opportunity for differentiation of work to meet the growing demands of high schools. At present, it is difficult to secure well-qualified teachers of Manual Training, Commercial subjects, Industrial subjects and Civics for the smaller high schools.

SUMMER SESSIONS.

The attendance at the summer session increases each year. In 1909, 452 were enrolled; in 1910, 640. The new certification law has put into the summer sessions hundreds of teachers who will go into country schools better prepared for their work. Six weeks is a very short time in which to prepare a young person just out of high school for the duties and responsibilities of teaching a country school; but it is infinitely better than no time at all. This minimum will have to be increased as soon as feasible, and the increase should be toward the equivalent of a County Training School course. At present the County Training Schools demand a year's work of high school graduates for graduation. This is the amount required a few years ago by the normal schools for the Elementary Certificate. It has occurred to me that counties having County Training Schools might have a County Training School certificate, or its equivalent, as the minimum qualification for teaching. Such a regulation would tend to keep up the standard in those counties that pay a special tax to support such schools and thus keep out those of less professional attainments that are drawn into the summer schools.

COUNTRY SCHOOLS.

A course for the preparation of teachers for country schools was established at the Oshkosh school in the fall of 1909, and it was patronized exclusively by country boys and girls. The subjects in this course are those that will have to be taught in the country school. This course, in a way, takes the place of the Elementary Course that

Oshkosh Normal School.

was abolished at the Oshkosh school last year, but those who finish the new course will be better prepared to teach in country schools than were those who finished the Elementary Course because the latter was simply a part of a course that didn't look toward the country school at all. It is hoped that through this new course a definite service to the country schools of the state can be rendered. There are those who feel that a normal school should devote itself entirely to the preparation of teachers for the graded schools of our cities and towns. As partially opposed to this, I am of the opinion that a normal school, supported by state wide taxation, should prepare teachers for the public schools of the state,—and the *public schools* include country schools, state graded schools, graded schools and free high schools. To prepare teachers for only one kind of school is to discriminate against the others.

Respectfully submitted,

JOHN A. H. KEITH.

August 31, 1910.

Platteville Normal School.

PLATTEVILLE.

HON. C. H. CROWNHART,
President Board of Normal Regents.

DEAR SIR:—I beg leave to make the following report. It will of necessity be incomplete, as my term of office covers but one of the two years included in this biennial period.

ATTENDANCE.

The attendance during the past year has remained practically what it was during the two years covered by the previous report. The summer school gained nearly 40%, and the regular year showed a small increase.

The capacity and equipment of the new building, however, are ample for the accommodation of a larger student body. The previous report, 1908–9, showed some increase and it is hoped the coming year may experience some growth in attendance.

A very encouraging fact relative to school attendance in Platteville is that practically one-third of the students are men. With the growing conviction of leading educators that masculine virility should be found more often in the school-room, I am pleased to report the usual good percentage of men in our school. Is it not extremely wise, therefore, to offer every inducement in the way of equipment and good teaching to continue to attract as large a number of men as possible to this school? Our demand for capable young men to serve as principals and teachers in high and graded schools, seems to answer the foregoing question. One city of the state, whose school system is among the very best, employed three young men seniors at a very early date. Two of our young men go into a neighboring state, one as principal of a new consolidated school at $100 per month.

There, also, has been a greater demand for young women than the school can supply. If we are to render the greatest service to the state, we must continue to attract strong young men and women to our school; and this in the long run can be accomplished only through thorough and consistent school work.

EQUIPMENT.

The equipment of the Platteville Normal is fair. Your honorable board has granted special requisitions that have helped materially in certain departments. During the year the department of geography has been materially improved in its equipment, as has also the department of physics. Other departments have received additions to their material equipments. The literary societies halls have been furnished, not completely, but fairly.

But, there is much that is yet needed. Nearly every department can be improved. General improvements are needed. It is a well known fact that our new building is suffering deterioration because of imperfect gutters. This matter has been brought to the Regents' attention repeatedly, but so far no action has been taken.

It is hoped that the study hall may, in the near future, be seated with opera chairs. This improvement would enable the school to accommodate comfortable audiences that frequently gather at the Nor-

Platteville Normal School.

mal Building. In fact, with the gallery already seated with opera chairs, the school would have an auditorium equal to any in the city.

During the year the school has acquired a small tract of land just west of the building. Adjacent lots should be purchased and added to the tract and in no distant day, a ladies' dormitory should be erected. The writer has taught in a number of training schools, but can think of no location in which a high grade dormitory would add more to the efficiency of a school than it would in Platteville. If Normal Schools pay it must follow that the thorough equipment of those already in existence would be sound economy.

CHARACTER OF NORMAL SCHOOLS.

To discuss the function of Normal Schools would be hackneyed. But normal schools must *individualize* themselves. They are technical schools; their function is specific. They lose their character if they only do the work of high schools. They must be alive to new opportunities. Their faculties should be growing educators, not hide-bound teachers. The Wisconsin Normals have been charged by the head of the state department, of education, who however is a true friend of Normal education as having fallen behind somewhat, in the rapid development and in the change of base in the new education. Without losing sight of their true mission, there should be something of an awakening in Normal Education in Wisconsin.

DEPARTMENT OF MUSIC.

It is well known that the Platteville Normal maintains an excellent department of music. Two supervisors for good sized cities were selected from the Normal this year. A call for another at a $650 salary was not filled. This was because the Board of Regents has not authorized a course for the training of music supervisors. A very small increase in salary appropriation would enable the school to supply excellent young teachers prepared to supervise music in public schools. This year, had such a department been recognized, there would have been some excellent young men pursuing the course. Will the Board of Regents not make it possible for us to do this work and thus add to the efficiency of the Platteville Normal?

ATHLETICS.

During the year nearly all branches of athletics have been carried on and engaged in by the Normal students of Platteville. In some lines they have been very successful in winning games and in all lines the organizations have conducted their affairs in a reasonable and honorable manner. Several of the men of the faculty have rendered assistance in coaching and managing the teams. As Platteville has a good representation of men it seems very necessary that the school own an athletic field. It is hoped that in the near future such provision will be made.

In closing I desire to express my sincere appreciation for the good work of my predecessor, J. W. Livingston, who had so much to do in building up the fine spirit which is ever evident in the school. And I further desire to express my thanks generously to the Board of Regents for their courteous treatment and cordial support.

Respectfully submitted,

W. J. SUTHERLAND.

August 31, 1910.

River Falls Normal School.

RIVER FALLS.

HON. C. H. CROWNHART,
President of the Board of Regents of Normal Schools of Wisconsin.

DEAR SIR:—I herewith submit to you the biennial report of the River Falls State Normal School for the period of two years ending August 31st, 1910.

After twenty years of service in the River Falls Normal School, ten of which were spent in the office of President, Mr. W. J. Brier severed his connection with the school on June 18, 1909, and the Board then promoted me to the position of President of the school on June 29, 1909. My previous experience in the school has been of great value to me in my efforts to direct the work of the school along the traditional lines established by my predecessors to meet the needs of the public schools of the state.

DEMANDS OF MODERN LIFE.

However, with the changing conditions of modern life have come changed ideals in regard to the function of the school. To meet these new demands, I have endeavored to readjust the work of the school, and to strengthen and encourage those departments which have such a close relation to the needs of society. The introduction of Manual Training and Domestic Science within recent years has brought new life into the school, and the privilege granted to students in the Normal Department of electing twenty weeks of Manual Training or Domestic Science has very greatly popularized and strengthened these valuable departments. The students are so eager to take work in these departments that it has become necessary for me to give special attention to their programmes in order to prevent them from taking Manual Training or Domestic Science in preference to the subjects required by their courses of study. Many students during the past year voluntarily took extra work in Manual Training; as a result of this interest, a degree of efficiency was attained by several young men which enabled them to secure fine positions as teachers of Manual Training.

PROVISION FOR TRAINING TEACHERS OF COMMERCIAL SUBJECTS.

In harmony with the effort to meet the demands of modern life by providing courses in Manual Training and Domestic Science, it appears that the time has come when the normal schools should make provision for the training of teachers of commercial branches. Many high schools have recently introduced into their courses of study stenography, typewriting, commercial law, book-keeping, etc., and the only institutions at this time that make any pretense toward preparing teachers of these subjects, are the private commercial schools or so called business colleges. Can the normal schools of the state afford to lag behind in this movement?

THE KINDERGARTEN.

For many years a Kindergarten Department was maintained in the River Falls Normal School, but three years ago this was abolished. I regret very much that this step was taken; such a department is necessary to the complete equipment of any Training School for teachers; certain phases of child life can never be fully understood by young

River Falls Normal School.

students in a normal school without the concrete illustrations of a good Kindergarten; there is a great need of such a department in the River Falls Normal School as a feeder to the grades of the Training School; moreover, the community greatly desires to have a Kindergarten maintained in the Normal School. May I dare to hope that the Board will reconsider its action of abolishing this valuable and necessary department by re-establishing a Kindergarten in the school?

COURSE OF STUDY FOR COUNTRY TEACHERS.

Educators and school officials appear to realize that the greatest weakness in our public school system is in our rural schools; much has been said and some things have been done within recent years to improve these schools. Believing that one of the functions of the normal school is the preparation of teachers for country schools, the River Falls Normal School, in common with three other normal schools of the state, will offer a course of study for country teachers, beginning with the school year, 1910–1911.

It is practically impossible to ascertain the extent of the influence of normal schools upon country schools; many young people of limited means enter the normal school and remain only one or two years or perhaps no longer than two or three terms, after which they drop out of the normal school to teach. When they leave the normal school, they almost invariably go into the country schools. Some of these people do not get enough out of their normal school work to be of any real value to them in their teaching, but many others take with them into the country schools a professional spirit, higher ideals, and an enlarged store of information, which they obtained from the normal school.

While we realize that the effort of the normal schools to help the country schools is in an experimental stage, we believe that a great field of usefulness is open in this direction, and from the situation of the River Falls Normal School, it appears that its services to the state will be greatly extended by the introduction of this new course of study.

SUMMER SESSION.

The abolition of the Summer Institutes of one or two weeks duration and the establishment of Summer Sessions at all of the normals was the most radical departure from the former policy of administering the normal schools that has taken place within recent years, at least, within the last decade, but we believe that it was a departure in the right direction. However, the Summer Session bears such a vital relation to the regular work of the school, that we are convinced that the present system of administering the Summer Schools should be radically modified; this may have been all that was necessary at the time when the Summer Schools were private or semi-private undertakings, but now that the Board has assumed complete control of these schools, some other system should be adopted that will make the Summer Session a closely related part of the regular school work.

Only two Summer Sessions have been held in River Falls; the first in 1909 from June 26 to August 6, and the second from June 27 to August 5, 1910. The attendance for the first year was larger than we had anticipated, but for 1910, we were somewhat disappointed. The increase in 1910 over that of 1909 was 31.

The following tabulation sets forth the important facts in regard

River Falls Normal School.

to the attendance for the two sessions, and gives a comparison of items of interest:

Summer Session.	1909	1910
Total enrollment	237	268
No. high school graduates	103	120
No. graduates common schools	50	46
No. graduates state graded schools	38	35
No. not graduates of any school	23	44
No. graduates county training schools	11	19
No. women enrolled	214	249
No. men enrolled	23	19
No. having taught eight months or more	127	132

PUBLICATION OF BULLETINS.

Beginning with December, 1909, we published the first quarterly bulletin issued by the River Falls Normal School. We have not attempted to set forth in these publications new truth discovered by a process of experimentation by members of our faculty, although we would certainly use such material if the limitations of our work did not prevent us from making investigations along new lines. It has rather been our purpose to use these bulletins to keep our patrons in touch with current educational topics and to acquaint them with the activities of the Normal School.

For nearly a year, we were unable to secure permission from the Post Office Department in Washington to enter our bulletins as second class mail matter. However, we have just received word from the authorities in Washington that the second class rate has been granted to us upon the same conditions that it is granted to other institutions of learning. This privilege is extended to the River Falls Normal School until a final decision is rendered by the Department with reference to postage rates upon the publications of all educational institutions; the River Falls school will then come under the same provisions established for all institutions of the same kind.

ATTENDANCE.

While there has been a slight increase in the attendance for the past two years, it is remarkable that there has not been a falling off in attendance, for the reason that the territory from which the school draws its students has been reduced to such an extent. From the nature of this enforced situation, the school does not enroll many high school graduates, there being only a small number of high schools in its territory.

The following analysis of the attendance for the biennial period ending August 31, 1910, makes clear the essential facts relating to this subject:

River Falls Normal School.

	1908-1909	1909-1910
Total enrollment in the Normal Department	322	322
Average daily attendance	250	277
Total number of Preparatory students not promoted	13	5
No. men in Normal Department	65	67
No. women in Normal Department	254	265
No. high school graduates	56	65
No. counties represented	18	15
No. practice teachers	76	86
Total enrollment in Training School	148	154
Total enrollment in all Departments	483	491

NEW TRAINING SCHOOL BUILDING NEEDED.

I have already called the attention of the Board to our great need of more room; in my annual report of June 29, 1910, I described at considerable length our crowded condition. Once more, I beg to refer to the situation which confronts us. I am convinced that the future growth of the school is very largely dependent upon the action which the Board may take to secure a new training school building, and I sincerely hope that something will be done to obtain from the next legislature an appropriation for this purpose.

While the River Falls Normal School is housed in a building well adapted to a large part of the work that must be done in such an institution, and while the equipment of the library, laboratories, and special departments is excellent, we find ourselves constantly hampered for want of room. Under present conditions, we can not possibly get the highest degree of efficiency out of our efforts; many of the activities of the school are limited or embarrassed on account of the smallness of our building. I would be recreant of my duty if I did not point out to you the needs of the school whose administration you have entrusted to me.

Our present building is not large enough, and, moreover, limiting the number of students would not remedy the difficulty. There are not enough rooms for all of the teachers and for the practice classes. To give some concrete illustrations in support of this assertion, I may call attention to the fact that our supervisor of practice must hear her two classes in methods in the room that is used by the teacher of music, and the music teacher, whose classes are smaller, is compelled to take at least one of her classes into a smaller room which is not provided with a piano. The president, who teaches one class, finds it necessary to shift his class about from room to room which is not only an inconvenience to him and his class but also to other members of the faculty who must vacate their rooms. The room occupied by the teacher of expression is hardly fit for a class room, because it is a part of the attic which was finished up to meet an emergency and, consequently, the ventilation is poor, and the heat from the sky-light almost unbearable during the warm weather, in fact, it can not be used during the warm summer days.

The room used for the reference library long ago became too small for the books and magazines belonging to the school and for the students to use for their reference work. Moreover, organizations like literary societies, and clubs for the study of music, literature, and language do not have rooms which they can regard as their homes, and for this reason it has been very difficult to maintain such organizations.

River Falls Normal School.

But the most serious difficulty which we experience on account of the limitations imposed upon us by reason of the size of our building, is in connection with the Training School.

Our Training School and Gymnasium are on the first floor of the building; the Manual Training and Domestic Science Departments are on the basement floor; while most of the regular Normal school classes recite on the second and third floors. However, several regular normal school classes must recite in rooms on the first floor, and all students who take Manual Training, Domestic Science, and Physical Training are compelled to pass through the corridors on the first floor. With such a situation, only one who has observed the movements of the classes can fully appreciate the annoyance to the teachers and pupils of the Training School. Moreover, the constant changing of the classes in the Training School is a cause of distraction to the normal school classes that must recite on the first floor.

I have related these facts in regard to our building to enable you to understand the way in which our work is weakened because of the limitations imposed upon us by the size of our building. I, therefore, earnestly urge upon you the importance of providing larger facilities for the future growth of the school—not necessarily growth in numbers,—but growth in efficiency through better organization which can be secured by means of adequate equipment.

To this end, I respectfully request you to take such steps as may be necessary to secure an appropriation for a new Training School building. Such a building could be located just west of the present building and connected with it. This would relieve the present situation and make it possible for the school to give to the state larger returns upon its present investment and at the same time justify the additional expenditure.

Respectfully submitted,

H. L. WILSON.

August 31, 1910.

Stevens Point Normal School.

STEVENS POINT.

HON. C. H. CROWNHART,
President of the Board of Normal Regents.

DEAR SIR:—I have the honor to submit to you the report of the Stevens Point Normal school for the biennial period ending August 31, 1910.

ATTENDANCE.

The enrollment during the two years 1908–09 and 1909–10 is indicated by the following tabulation:

	1908-09	1909-10
Normal	349	358
Special	4	10
Total	353	368
Grammar grades	90	94
Intermediate grades	50	39
Primary	32	33
Kindergarten	36	43
Total	208	209

The table reveals the presence of good bodies of students whose activities in the school have been directed by teachers—scholarly, skillful, cooperative and zealous—to the end that these students make constant growth in lines of character, purpose, ideals,—the trinity of qualities, required by young men and women who are to mold the characters, and guide the destinies of the future citizens of the commonwealth, in order that our democracy may be enduring, effective and progressive.

FACULTY MEETINGS AND COMMITTEES.

The administrative work of the Normal school makes large demands on the energies of the President. In order that he may be relieved of some portion of this administrative work, the general problems of administration are discussed in the faculty meetings, and the details are executed by committees either permanent or special. The permanent committees, whose general duties may be inferred from the names, are as follows:

Organization and Discipline; Studies and Graduates; Athletics; Building and Grounds; Sick; Entrance Examinations.

The committees report at faculty meetings along the lines of their respective duties, the necessary action following the decision arrived at by the faculty.

It is the practice of the school to hold regular faculty meetings for the purpose of considering all matters, professional as well as administrative, which have to do with increasing the efficiency of the school. During the past year the faculty made a thorough study of McMurry's "Teaching How to Study." The discussions in the faculty meetings being productive of much in ways of inspiration, and pedagogical practice.

Stevens Point Normal School.

NEW DEPARTMENTS.

At the June, 1909, meeting of the Board action was taken establishing the Manual Training work on a more substantial basis. Prior to that time the work was carried on irregularly, members of faculty having other burdensome duties, directing the work as occasion offered.

The work is now in charge of a regular teacher, the department accommodating not only the pupils in the grades, but the Normal students as well, the work being optional both for Elementary and advanced course students, because of electives offered, and many students have taken advantage of the opportunity afforded.

At the meeting of the Board held June, 1910, the president of the school was authorized to employ an additional teacher in the Domestic Science department. For years the whole of this work was done by one teacher, taxing her time and energy to the utmost. By securing the needed additional teacher the work in this department will be more effectively organized, and more thoroughly administered.

Public agitation resulting in, and supplemented by, legislative action which extends state aid to schools introducing Manual Training and Domestic Science, has led to its adoption as an integral part of the course of study in many schools, thereby increasing the demand for competent teachers of this branch. To meet this demand, the Board at its meeting in February, 1910, passed a resolution extending the Domestic Science course one year, so that after February 1st, 1911, the course will be five years for those entering the Freshman class, and three years for High school graduates, thus insuring a high quality of academic and professional preparation.

Liberal provision has been made for equipment of both Manual Training and Domestic Science departments, making them second, in point of practical furnishing, to no institution in the state.

MATERIAL IMPROVEMENTS.

Convenience of the building has been conserved by the expenditure of over sixteen thousand dollars appropriated by the legislature at its last session. This money has been largely expended on a boiler plant, now completed. The plant, with the new boilers, is placed a short distance north of the building, minimizing danger of explosion to lowest possible terms. The house is now thoroughly warmed, adequately heated, furnished on every floor with sanitary drinking fountains, and, from the physical as well as the professional point of view, is available throughout for school purposes.

THE FUTURE.

The local community has maintained cordial relations with the school, has generously patronized the model grades, and cooperates with all of its activities for betterment—the school being keenly appreciative of the genuine spirit manifested.

Many of the graduates have taken courses at the University and now occupy remunerative and responsible positions in faculties of Universities, Normal schools, and County Training schools, as City and County superintendents, and as principals of High schools. Wherever found, the members of the alumni have performed their pedagogical and citizenship duties with credit, dignity and honor, both to themselves and the institution, justifying the position that the Stevens Point Normal faces the future with hope and confidence.

Respectfully submitted,

JOHN F. SIMS,
President.

August 31, 1910.

Superior Normal School.

SUPERIOR.

HON. C. H. CROWNHART,
President of Board of Normal School Regents,
Superior, Wisconsin.

DEAR SIR:—I have the honor of submitting the following biennial report for the years 1908–1909 and 1909–1910.

ATTENDANCE.

During the past two years the attendance at the Superior Normal School has materially increased. The highest enrollment in the history of the school at the end of the last biennial report was 331 in the Normal Department. The attendance for 1908–1909 was 423, while this year the attendance has reached 445. The record also shows a marked increase in the number of high school graduates and also a larger number of boys. The increase in these two classes is gratifying to the authorities. A study of the catalogue also shows that the clientage of the school represents a larger section of the state than in any previous years. This year the attendance during the regular ten months of the year represents eighty-three places outside of Superior. This marked growth in attendance is due largely to the rapid growth of this northern section of Wisconsin. All over the northern part of the state the timber cruiser and the logger are giving way to the farmer and the merchant, and the site of the lumber camp is now the site of the school house. These pioneers are anxious to have their children get an education. They believe in giving them the best which their finances will afford. Three-fourths of the school houses in this county are provided with the latest type of ventilating systems. The teachers are supplied with the very latest apparatus in the way of charts, globes, etc., for the use of these boys and girls who live in the country. Just as soon as the children finish the country school they are sent to the state graded school or the high school and eventually they find their way into the Normal School, where many of them prepare themselves for the teaching profession. These students are most valuable people, as many of them go directly into the country schools after they have attended the Normal School for a time, and as a result, the standard in the rural schools is gradually being raised.

The spirit of the pupils in attendance at the Superior Normal School has been excellent. It is an inspiration to the faculty to work with young people who not only appreciate the advantages the state is offering them through the Normal Schools, but who show this appreciation by both work and words. Many of these students find it possible to work their way through school by doing house work or by doing odd jobs in the city. It is not necessary for me to say that these form a body of industrious and capable young people.

The large increase in the number of students during the past two years finds us crowded for room. Many of the class rooms during the past year have been over-crowded so that it has been necessary for us to carry chairs from room to room in order to accommodate the people coming to these classes. One unfavorable condition comes about through the crowded condition of the assembly room. The assembly room is seated with opera chairs with small book racks on the back. When the attendance was such that each student could have two chairs, it was easy to take care of the books. At the present time,

Superior Normal School.

however, the problem of a study room is a difficult one. If the attendance at the Superior Normal School should increase even slightly within the next two or three years it will be almost necessary that we have some additional room. It is the hope of the faculty that the Board of Regents may feel it advisable to ask the Legislature for an appropriation sufficiently large to add another wing to the building to provide for the pressing needs of the school.

FACULTY.

During the past two years there has been a number of changes in the faculty, most of those leaving doing so either on account of marriage or on account of an opportuntiy for improving their condition professionally and financially. The spirit of the facutly is excellent. In fact it is a pleasure to report that in this respect the faculty of the Superior State Normal School is almost ideal. Many of its members are now working toward advanced degrees, three or four having been granted leave of absence in order that they might pursue work either here or abroad which would directly add to their effectiveness as teachers or give them broader culture. It has been the policy of the President to encourage this work in every way possible. The live teacher is the one who is growing, and the inspiring teacher is the one who is himself a student. It is sincerely hoped that the next Legislature will make such a liberal appropriation to the Normal Schools that the salaries of the faculty may be so increased that they may find it possible to pursue advanced work without financial sacrifice.

DORMITORY.

It is with pleasure that we report the approaching completion of the girls' Dormitory. Already the rooms are being taken, so that before the end of the vacation we anticipate that every available part of the Dormitory will be engaged. This institution should mean much to the school. It is not simply a problem of providing hygienic living or of affording accommodations at reasonable rates. To my mind the culture side of the life in the Dormitory means even more to the growing teacher than does the other. It is the plan of the authorities to so conduct this Dormitory that the girls will find in it an ideal home where they can have an opportunity to get the best things which it is possible to get in an institution where young people are met together for physical and mental improvement.

Arrangements have already been made and a committee appointed whereby the school will be able to keep in closer touch with the home life of every student. Where it is necessary for students to room and board outside of the dormitory, the faculty committee will inspect the home, and no student will be allowed to room or board at any place not on an approved list kept in the office of the President. We feel that the home life of the students living here is vitally related to the school life, and it is our intention to make it as easy as possible for every student to choose the right thing and to do the right thing, mentally, morally and physically.

The members of the faculty have felt for a long time that more ought to be done in the way of physical supervision. Already we have made it possible for the gymnastic classes to take a large part of their work out of doors during the spring and fall. We have done this for two reasons. First, because we believe that no gymnasium work is equal to out-door work, and in the second place because most of these teachers

Superior Normal School.

will be teaching in places where they have no gymnasium and no gymnastic apparatus. It will be necessary for them in a way to supervise the games and plays of the children; consequently we are making a special effort to teach the young people in the gymnastic classes how to play and how to supervise playing. In order to more fully meet the growing demands in this direction it will be absolutely necessary that we have some play ground apparatus. Already many of the towns in the state are planning play grounds. Our teachers will be called upon to supervise some of this work. I have the feeling that this kind of work on the part of the Normal School will prove especially valuable to the teachers of the state, and it is our intention to more fully provide for instruction in this line. We have already laid out tennis courts and fields for base ball and foot ball. It is our plan to set apart a portion of the campus for a play ground where the children of the grades may play, and where the student teachers may have a chance not only to learn the best play ground games, but to supervise them in a sane and helpful manner.

During the past year we have tried to pay more attention to the question of general health of the pupils. Drinking fountains have been installed all over the building and emphasis has been laid in the classes in hygiene and gymnastics on the general subject of health. We intend during the coming year to take up in a special way the question of contagious diseases and their prevention, and such allied subjects. As I have previously reported to your honorable Board, I feel that there is a growing need that we have some form of medical inspection. I do not believe that the Normal Schools can afford to send out young people who are physically below the normal, to take charge of the young people of the state. I am therefore renewing my request for permission to make arrangements to have a staff physical in connection with the Superior Normal School who can assist in the physical examination of the pupils when they enter; who can be consulted by the physical director in special cases; who can prescribe corrective work for those who need it, and can act as physician for the dormitory.

It is unnecessary for me to say more than a word concerning the Summer Schools in connection with the Normal School. Their success has justified their existence. This past year we have had an attendance of 366. These young people who come to us in the summer are especially zealous and show a spirit which is helpful to all. The only suggestion which I desire to make in connection with the Summer School is that the principal be allowed to increase the number in the faculty so that the work may be brought closer to the individual students. With a six weeks' summer school it is more imperative that the work be brought close to the pupil, than is the case in the regular term where the teacher has the pupil for a half a year at a time. I think no argument is necessary on this point.

During the past two years a number of the faculty have spent considerable time in the schools of the state visiting them and making addresses. The past spring more calls came for members of the faculty to deliver addresses than could be accepted. This outside work by the faculty is one of the most helpful agencies for improving the professional standing of the school, and at the same time there is no better way for stimulating young people outside to seek a better preparation for teaching.

Aside from the material needs of the school already mentioned, it seems to me that the time is soon coming when the Normal Schools must expand along one or two lines. With the growing demand for industrial work in the high school and the grades, the time is coming

Superior Normal School.

when the Normal Schools of the state ought to take up this phase of education with more seriousness than they have in the past. I do not see why the Normal Schools should be limited to any particular line of preparation for teachers. If the state is demanding trained high school teachers, teachers of Agriculture, teachers of commercial branches, etc., then I can see no reason why the Normal Schools of the state, which were organized for the purpose of supplying teachers for the state, should not meet the demands by establishing departments where these subjects could be taught and professional work given in these special lines. Surely the state is financially able to take care of her children and to offer them the best which it is possible to provide for them. I believe the time has come for the Normal Schools to ask largely. The people of the state are demanding better things. It should be the pleasure and the duty of the Normal Schools to meet the demand.

Thanking your Honorable Body for its many courtesies, helpful suggestions and wise supervision, I remain,

Sincerely yours,

V. E. MCCASKILL,
President.

August 31, 1910.

Whitewater Normal School.

WHITEWATER.

HON. CHAS. H. CROWNHART,
President Board of Regents of Normal Schools.

DEAR SIR:—In compliance with the regulations of the Board of Regents I have the honor to submit the following report for the two years ending August 31, 1910:

ENROLLMENT.

NORMAL DEPARTMENT.	1908-1909	1909-1910
Post graduates	1	0
Senior class	80	71
Junior class	96	101
Second year classes	66	46
First year classes	81	36
Special students	4	4
Preparatory classes	2	20
Totals	330	278
Number of ladies	266	218
Number of gentlemen	64	60
MODEL DEPARTMENT.		
Grammar grades	43	42
Intermediate grades	43	51
Primary grades	60	59
Kindergarten	50	48
Totals	196	200
Total in Normal department	330	278
Total in all departments	526	478
In summer school	351	408

SOURCES OF MEMBERSHIP.	1909-1910
Admitted on entrance examination	16
Admitted on high school diplomas	83
From 2nd to 3rd years of high schools	7
From 9th grade	7
On teachers' certificates	0
Promoted from preparatory department	5
From other Normal schools	2
From county training schools	4
From 8th grade to Course for Country Teachers	11
Total	135

Whitewater Normal School.

Enrollment by Counties. Normal Department, 1909–1910.

Adams	1	Richland	18
Calumet	1	Rock	26
Columbia	5	Sauk	11
Dane	14	Walworth	98
Dodge	2	Washington	9
Door	1	Waukesha	24
Grant	4		
Green	9	OTHER STATES.	
Iowa	8		
Jefferson	12	Iowa	1
Kenosha	3	Illinois	3
Lafayette	5	Michigan	2
Lincoln	1	Colorado	1
Marquette	1		
Milwaukee	7	Total	278
Racine	11		

Graduates.

	1908-1909	1909-1910
Graduated (Advanced Course)	64	59
Certificated (Elementary Course)	45	7
From Course for Country Teachers		2
Totals	109	68

The Occupation of Graduates.

As reported in May, 1910, was as follows:	
Graduates from Advanced Course, men, 241; women, 664; total	905
Have not taught since graduation	31
Still in the teaching profession	443
Have completed college or professional courses	106
Now in college or university	35
Have entered other professions	40
Women who have married and left the profession	204
Deceased	54
Completed the Elementary Course Only.	
Men, 154; women, 545; total	699
Have not taught since certification	38
Are pursuing the Advanced Course	21
Have completed college or professional courses	36
Still in the teaching profession	209
Have entered other professions	27
Women who have left the profession by marriage	228
Deceased	57

Whitewater Normal School.

It thus appears that of graduates from the Advanced Course, for the whole period of 39 years, about 50 per cent are still in the profession; while only 3½ per cent have not taught since graduation. Six per cent have died, and 22½ per cent (women) have left the profession by the matrimonial route. Of those finishing only the Elementary Course, through a period of 35 years, 30 per cent are still teaching.

SUMMER SCHOOL.

The Whitewater Summer School has just closed its tenth annual session. During the ten years of its operation the enrollment has gradually advanced from 88 to 408. So far as those in charge of the work are concerned, it seems clear that the new "Minimum Qualification Law" has already amply justified itself. The whole membership has attended for the full six weeks of the term, and their work, on the whole, has been faithful and even eager.

Of the 408 enrolled, 36 were men and 372 women, 298 were graduates of High School or Academy; and 5 were graduates from College or the Advanced Course in a Normal School. Of the 408, 278 had never before had any professional training, and 183 had, as yet, held no teachers' certificate. Of the remainder, 120 held the Third Grade County Certificate; 69, the Second Grade; 21, the First Grade; and 15, State Certificates. Again, 186 had taught at some time in country schools, while 199 had never taught at all; but 286 expect to teach in rural schools the coming year. Only 81 attended to gain credits on the Normal School Courses, but 41 attended for professional improvement without regard to certificates or credits. It will thus be seen that the Summer School is reaching the classes of people for whom it is designed.

THE NEW LIBRARY.

For some years past, the school has suffered from inadequate accommodations in two directions, the Library and the Training Department. The fine new building now approaching completion will relieve this difficulty in a very satisfactory manner. One whole floor of this Annex will be occupied by the Library and its appurtenances, including a lecture room and a work room.

In connection with this expansion of library facilities, a new step will be taken in the inauguration of a regular course in Library Methods, designed to prepare teachers, so electing, for the duties of School Librarians in the public schools of the state.

THE TRAINING DEPARTMENT.

For years, I have urged upon the Board the desirability of a reorganization of the Training Department so that not more than two grades should be seated in the same room, to the end

(1) That the Critic Teachers might give somewhat more of their time to the direct instruction of the children under their charge, and

(2) That a larger number of children might be accommodated, thus improving the opportunities for Practice Teaching. With the opening of the new Annex, and the employment of an additional Critic Teacher, these ends will be measurably attained. It is confidently expected that our Training Department will now enter upon a new era of efficiency.

Whitewater Normal School.

COST OF LIVING.

The greatly enhanced cost of living in the last two years, so clearly felt in private circles, is likely also to have an obstructive effect upon Normal Schools. The membership in our schools is not from the wealthy class, but consists largely of persons who must depend upon their own exertions for maintenance. An advance of 20 or 25 per cent in the cost of board, which has actually taken place, brings it to a figure which is especially formidable to parents as well as self-supporting students. There is reason to fear, therefore, that attendance on the Normal Schools during the coming year may suffer somewhat from this cause.

This factor of cost of living is likely to affect the Normal Schools through the hardship which it works on teachers as well as students.

SALARIES.

In my report four years ago, I spoke as follows on the subject of salaries: "It is true beyond question that the best talent in the teaching profession ought to be at the command of Normal Schools. It is here that the very best teaching should be exemplified. But it is equally true that the best teaching talent can no longer be retained at the salaries now paid to the majority of teachers in the Wisconsin Normal schools. The most difficult problem which confronts the presidents of these schools is that of keeping their faculties up to the proper standard of excellence. The selection of suitable teachers is a difficult task, at the best, but it is greatly increased by inability to compete with other institutions and states offering such compensation as will attract and retain the best teaching talent.

Moreover, the work of teachers in the Normal schools is heavy as compared with that in higher institutions, the University for instance. They have to teach more hours in the day and more weeks in the year; their labor is intense and wearing. They are subject to criticism in their work as perhaps no other teachers are; and their positions are none too secure.

It would seem, for all these reasons, that the people of Wisconsin, and especially the Legislature, ought to be made duly aware, without further delay, of the conditions which exist, and the economic need, as well as justice, of a more liberal salary scale in the Normal Schools of the State. Just at this time, that is unquestionably the most important condition for increasing efficiency and success in these schools."

These words, true when written, are even more emphatically true at the present time. As above indicated, the increased cost of living, not accompanied by any corresponding increase in compensation, bears heavily on all teachers, both the married and unmarried. It would certainly seem to be time for the salary scale to begin following upward after the increasing cost of subsistence. It comes near being a question not only of justice but even of mercy.

COURSE FOR COUNTRY TEACHERS.

In conformity with the purposes of Chap. 204 of the Laws of 1909, and by authorization of the Board of Regents, a two years' Course for Teachers of Country Schools has been inaugurated in the Whitewater School, displacing the old Preparatory Department. This Course is parallel and equivalent to the Courses given in the best of the County

Whitewater Normal School.

Training Schools. During the past year, classes have been formed in both years of the Course, but the enrollment has not been as large as we desire. It is hoped that another year will make the nature and value of this Course more widely known and place it on a prosperous basis. If this effort to serve the interests of the rural schools should not meet with favor, that would seem to demonstrate that the State Normal Schools can have little direct influence on the progress of education in the country schools.

Respectfully submitted,

ALBERT SALISBURY.

Whitewater, Wis., August 31, 1910.

REPORT

OF THE

STATE FORESTER

OF WISCONSIN

For 1909 and 1910

MADISON, WIS.
DEMOCRAT PRINTING COMPANY, STATE PRINTER
1910

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OFFICE OF THE STATE FORESTER,

MADISON, WIS., Dec. 31, 1910.

State Board of Forestry.

GENTLEMEN: I have the honor to submit herewith my report for 1909 and 1910.

Very respectfully,

E. M. GRIFFITH,

State Forester.

Report of the State Forester

INTRODUCTION.

It is now over seven years since the passage of the first forestry law in 1903, so that the recommendations in this report are based upon experience. The state forest reserves have grown in these years from 40,000 acres to 340,000 acres, but the state must have a reserve of at least 2,000,000 acres in order to protect the headwaters of our most important rivers; to aid in retaining our wood-using industries within the state by supplying them with timber, their raw material which they must have, and to protect the beauty of our wonderful northern lake region that should annually bring millions of dollars into the state, through tourists, campers, hunters and fishermen.

Our loss of forest resources by forest fires has been simply appalling amounting to $9,000,000 in 1908, and to over $5,000,000 in 1910, and our town fire warden system has proved absolutely inadequate, as it is based upon the wrong principle of fighting fires after they occur and not of preventing them.

All who have studied the question agree that the time has come when the legislature must look at the forestry work from the broad view point of the best state policy and decide definitely what the future policy shall be.

Wisconsin has ranked as one of the greatest lumber producing states in the Union and much of her wealth has and should come from her forests. However, the figures compiled by the U. S. Census Bureau show us how rapidly Wisconsin is losing her proud position in lumber production, for while she ranked first in 1900 the figures for 1910 show that she has dropped to eighth place and that the decrease in production has been 40%, which is a greater loss than that of any other state.

Our wood-using industries consume annually more than 930 million board feet of lumber valued at $20,000,000, and this

is only a part of the lumber industry of the state, as the figures given do not include the output of the sawmills or other forest products that are not considered as raw material for further manufacture. Even at the present time only 50% of the lumber that is used by our wood-using industries is grown in Wisconsin.

The wonderful forest resources of the state have been fearfully depleted by forest fires and in order to save the remaining forests and retain the wood-using industries within the state, the enormous annual losses from fires must be stopped. It is worse than useless to temporize or try to cheat ourselves into thinking that some of the old makeshifts will do.

The State Conservation commission, the Special Legislative committee on Waterpowers, Forestry and Drainage, and the State Board of Forestry, after careful study of the whole situation, all join in recommending to the legislature that a general state tax of 2–10 of a mill be levied and collected annually for twenty years and that the proceeds be granted to the State Board of Forestry in order to purchase the lands that it is absolutely necessary for the state to own in order to consolidate the forest reserves and thus make forestry management possible; to pay for the protection and improvement of the forest reserves and also for a forest fire patrol system that will be organized to prevent, as far as possible, the starting of forest fires in all the forest regions of Wisconsin. Such a tax will yield about $600,000 a year and it is estimated that in ordinary seasons of average fire danger, the patrol system will cost $250,000, leaving $350,000 a year for the purchase of state forest reserve lands and their improvement and protection.

To many members of our legislature this will seem a very large sum to devote to the work but such a revenue is absolutely necessary if our forest lands are to be saved from destruction by fire and if the state is to acquire an adequate forest reserve. The patrol system will be called upon to protect some 13,000,000 acres of land and the amount asked for this work, $250,000, means therefore an expenditure of only 2 cents per acre annually which is the very lowest amount for which any reasonably adequate patrol can be secured.

As explained, the state should acquire a forest reserve of 2,000,000 acres, while the reserves now comprise 340,000 acres, leaving 1,660,000 acres to be purchased. These lands can probably be secured at an average cost of $4 per acre and upon this

basis $6,640,000 must be expended in twenty years, leaving some $400,000 for the protection and improvement of the reserves.

It will be seen from the above that at least $600,000 will be required annually and that a 2-10 of a mill tax will yield this amount. As State Forester, I have attempted in the following report to make plain the great necessity of taking prompt action in this matter and the absolute need of spending a large amount of money to protect and conserve our forest resources.

This question is not presented for the first time but has been before the people for the past two years, and it is believed that they fully appreciate the need and would readily pay the tax that is asked. The matter is now clearly before the legislature and it is hoped that they will see the great importance of prompt action and will carry out the recommendations of the Special Legislative committee, which has studied this matter for two years, by providing that the State Board of Forestry shall have the proceeds of a 2-10 of a mill tax for a period of twenty years. Mere talk or good intentions will not conserve our forest resources, and the great importance of deciding upon a clear, definite forest policy demands the best efforts of our legislature.

GROWING PUBLIC SENTIMENT FOR FORESTRY.

The great importance of the forestry movement has been emphasized repeatedly of late years in the utterances of prominent men, in the official messages of our governors and presidents, in resolutions and declarations formulated by conventions and congresses, in political platforms and in trade journals and many periodicals of more general interest. It would be impossible to reproduce here any large number of such statements advocating forestry, but a few have been selected to show the great growth of public sentiment for forestry, both in the state and in the nation.

Theodore Roosevelt. Special Message to Congress, Jan. 22, 1909.

We know now that our forests are fast disappearing, that less than one-fifth of them are being conserved, and that no good purpose can be met by failing to provide the relatively small sums needed for the protection, use and improvement of all forests still owned by the Government, and to enact laws to check the wasteful destruction of the forests in private hands. There are differences of opinion as to many public questions; but the American people stand nearly as a unit for waterway development and for forest protection.

Message of President William H. Taft to Congress, Dec. 5. 1910

Nothing can be more important in the matter of conservation than the treatment of our forest lands. It was probably the ruthless destruction of forests in the older states that first called attention to the necessity for a halt in the waste of our resources.

Governor Robert M. LaFollette of Wisconsin. Special Message of April 12, 1905.

. . . . The state forestry legislation, adopted two years ago, very defective in many respects, will it is hoped be so amended as to establish this important work upon a permanent and efficient basis. It is referred to in this connection because the pre-

servation of our forests and the reforesting of lands about the sources and along the head waters of our principal streams, are absolutely essential to the preservation of Wisconsin's splendid waterpowers. The restoration of our forests, and the preservation of our waterpowers go hand in hand.

Governor Charles E. Hughes of New York. Message of January 1, 1908.

It would be difficult to name any matter of greater importance to the people than the conservation of our forests. To this end the State should largely extend its purchases and so far as possible avoid the increased cost which will be entailed by delay. Any effort on behalf of private interests to invade the common right in these lands and their maintenance for the public benefit should be defeated.

Governor James O. Davidson of Wisconsin. Message of January 13, 1909.

For many years thoughtful men throughout this nation have been sounding a warning against the wholesale destruction of our forest areas. . . . Our forest reserve now comprises 300,000 acres of land . . . The acquiring of other lands for forestry purposes, especially on or near the headwaters of our streams, should be encouraged.

Declaration of Governors at the Conference of Governors in the White House, Washington, D. C., May 13—15, 1908.

We agree . . . that the forests which regulate our rivers, support our industries, and promote the fertility and productiveness of the soil should be preserved and perpetuated . . .

We urge the continuation and extension of forest policies adapted to secure the husbanding and renewal of our diminishing timber supply, the prevention of soil erosion, the protection of headwaters, and the maintenance of the purity and navigability of our streams. We recognize that the private ownership of forest lands entails responsibilities in the interests of all the People, and we favor the enactment of laws looking to the protection and replacement of privately owned forests.

Report of the National Conservation Commission, Dec. 7, 1908.

The conservative use of the forest and of timber by American

citizens will not be general until they learn how to practice forestry. Through a vigorous national campaign in education, forestry has taken root in the great body of American citizenship. The basis already exists upon which to build a structure of forest conservation which will endure. This needs the definite commitment of state governments and the Federal Government to their inherent duty of teaching the people how to care for their forests . . .

Under right management, our forests will yield over four times as much as now. We can reduce waste in the woods and in the mill at least one-third, with present as well as future profit. We can perpetuate the naval stores industry. Preservative treatment will reduce by one-fifth the quantiy of timber used in the water or in the ground. We can practically stop forest fires at a cost yearly of one-fifth the value of the merchantable timber burned.

Declaration of Principles Adopted by the North American Conservation Congress, held at Washington, D. C., Feb. 23, 1909.

We recognize the forests as indispensable to civilization and public welfare. They furnish material for construction and manufacture and promote the habitability of the earth. We regard the wise use, effective protection, especially from fire, and prompt renewal of the forests on land best adapted to such use as a public necessity and hence a public duty devolving upon all forest owners alike, whether public, corporate or individual.

We consider the creation of many and large forest reservations and their permanent maintenance under government control absolutely essential to the public welfare.

Summary of recommendations contained in the Report of Senators Paul O. Husting and Henry Krumrey, Members of Special Legislative Committee appointed to investigate and recommend Legislation relating to water powers, forestry and drainage, January 24, 1910.

1. The passage of bill No. 502, S., so amended as to provide a state tax of two-tenths of one mill for each dollar of the assessed valuation of the taxable property in the state, to be collected annually for a period of twenty years, the tax when levied and collected to constitute "a forestry investment fund" to be used

for the purchase, improvement and protection of forest reserve lands.

2. The passage of amendment No. 2, to bill 468, S., which provides for the piling and burning of white, Norway and jack pine slash in Wisconsin.

3. To the careful consideration of the lumbermen of the state of Wisconsin the utilization of hardwood slash by means of chemical plants.

4. The employment of an effcient fire patrol by the state board of forestry.

Report of the Committee on Forestry of the National Hardwood Lumber association at the 13th annual convention held in Louisville, Kentucky, June 9—10, 1910.

Among the nations of the world the United States has for the past fifty years been noted as a country of deplorable waste, and, as we know, the hardwood lumber industry has keenly felt this lack of economy. We believe that our association has had much to do with the present recognition on the part of the chief executive of our nation and of Congress, as to the crying need for the enforcement of such regulations as will effectively bring about a real conservation of the natural and national resources of this country . . . .

At the present rate of consumption in the United States of over 50 billion feet of lumber per annum, it requires no prophet to foresee a complete exhaustion of the visible supply, unless a superhuman effort is exerted by the national and state legislatures, together with co-operation on the part of all men interested in lumber, to safeguard the standing timber and adopt effective measures for reforestation.

Platform of the second National Conservation congress held at St. Paul, Minnesota, September 5—9, 1910.

We earnestly recommend that the states and federal government acquire for reforestation lands not more valuable for other purposes, and that all existing forests publicly and privately owned be fully protected by state and federal governments. We recognize the invaluable services of the forest service to the people and earnestly recommend that it be more generously supported by the federal government, and that state, federal and private fire patrol be more generously provided for the preserva-

tion of forests and human life; and appreciate and approve of the continuance of the service of the United States army in fire patrol in emergencies.

From the statement of principles and policies of the Southern Conservation congress held at Atlanta, Georgia, October 8, 1910.

We hold firmly and unalterably, that such conservation of our natural resources as is consisitent with their proper and wise utilization is a deep moral obligation, and that only through recognition and observance of this obligation can the perpetuity of our people be assured . . . .

Approving the federal forest policy and indorsing the service whereby this policy is carried out, we urge upon our states the establishment of state forests and the enactment of laws insuring the conservation of forests in private possession; such laws to provide for more equitable taxation, prevention of forest fires and reforestation of lands less valuable for other purposes.

Recommendations of the Northern Hemlock and Hardwood Manufacturers' Association.

The Forest Fire Committee of the Association met with State Forester E. M. Griffith, and Assistant State Forester, F. B. Moody at Milwaukee on Nov. 12, 1910 to discuss plans for the prevention and control of forest fires in Wisconsin. After consideration of the tentative measures proposed by the State Board of Forestry, the Committee decided to recommend the following propositions:

First, that a two-tenths of a mill state tax be levied to provide a fund for fire prevention and the purchase and protection of state forest reserve land.

Second, That the State Board of Forestry expend such portion of this fund as may be necessary for patrols in the forest counties on the basis of not less than one patrol to each 40,000 acres of total area.

Third, that efficient county fire wardens be substituted for the present town fire wardens.

Fourth, that there be strict regulation of the burning of brush and debris to clear land during the dry season under the direction of patrolmen.

Fifth, that the State Board of Forestry should have the right

to order the disposal of slash adjacent to standing timber or other valuable property in such manner as to provide a reasonably safe fire line.

Resolutions of the Lake States Forest Fire Conference.

The Lake States Forest Fire Conference was held in St. Paul December 6 and 7, under the auspices of the Minnesota State Forestry Board and the Minnesota Forestry Association. It was composed of strong representatives of the lumbermen, timber owners, railroads, state boards, United States Government and others who are vitally interested in the prevention of forest fires in Minnesota, Wisconsin and Michigan.

After thorough discussion of all phases of the question, the following resolutions were unanimously adopted:

Resolved, That we recommend to the legislatures of our States:

First. That the forest fire protection of each State and such other branches of state work as may be deemed best to combine with it, be placed under the control of a non-partisan Commission empowered, as fully as possible under the Constitutions of the different States, to carry on the work, and under civil service rules. Such Commission should represent all the interests involved as far as possible, and we recommend that such Commission place the work in charge of a Chief Forester who should be a professional graduate Forester and that the Commission employ such trained Foresters and other assistants as may be necessary; define their duties and fix their salaries; said employes to be engaged under such civil service regulations as the Commission may prescribe.

Second, Resolved, That it is the sense of this Conference that the present Forest Fire Warden Service of Michigan, Wisconsin and Minnesota, is totally inadequate to meet the existing fire hazard to both life and property, and that forest protection service, to become efficient, must be greatly extended. To this end we recommend an adequate Forest Patrol System, maintained by the State, organized and operated by the Commission referred to.

Third. We further recommend, that the Commission be authorized to co-operate with the National Government, the several adjoining States, and such associations and organizations as the Commission may find necessary to best protect the timber resources of the State.

Fourth. Resolved, That this Conference is opposed to a general slash burning law, as experience has proven it unsatisfactory, impractical and dangerous. We recommend, however, that the Commission should be given authority to order the disposal of dangerous slashings sufficient to establish a safe fire line around standing timber or other valuable property.

Fifth. Resolved, That this Conference advocates legislation providing strict regulation of the burning of brush and debris in clearing land during the dry season, such burning to be under the direction of the State fire patrolmen under such regulations as the Commission may prescribe.

Sixth. We further recommend, that the burning of all debris on the rights of way of the various railroads be under the control and direction of the State Forest Patrol. Further, that under special conditions as directed by the State Forest Patrol the railway companies maintain a patrol, properly equipped following their trains, also that all railroad and logging locomotives and traction engines must be equipped with the most practical spark arresting devices subject to inspection and approval of the Commission.

Seventh. Whereas, The building of fire lines around exposed property including settlements, villages and towns, has proven a most effective means for the control and extinguishment of fires, we recommend, that one of the principal duties of the patrolmen working under the direction of the Commission, should be to establish such fire lines where necessary for protection of property.

Eighth. We recommend, as the most effective measures for preventing and fighting serious fires, adequate means of transportation and communication, to include trails, telephone lines and lookout stations, and that the efforts of the Commission should be exerted toward the construction and establishment of the same as rapidly as consistent.

Ninth. The appalling sacrifice of life and the continued great loss of State and private property resulting from fires in our forested area, are a disgrace to our civilization and a most serious drain upon our natural resources, and we believe that the expenditure of such amount as may be necessary to prevent these losses is fully justified.

We therefore recommend, that the appropriations by the State Legislatures to maintain forest protection should be sufficient to

provide for a Forest patrolman for each forty thousand acres requiring protection as well as for the expenses necessary to successfully carry out all of the measures suggested by these resolutions.

Tenth. We recommend, in addition to the Patrol System, an auxiliary County fire fighting force to be appointed by and under the direction of the Commission, to be paid by the State and charged back to the Counties. Such expense to be ultimately borne by the Counties or towns in which the fires occur.

Further Be It Resolved, That as it is shown by statistics that there are a large number of fires set each season through the carelessness or the general public, including campers, fishermen, hunters and others, we recommend, that a campaign of education be energetically carried on through every possible channel to the end that this hazard be reduced through a better understanding of forest conditions by all the people.

Recommendations Contained in the Report of the State Conservation Commission of Wisconsin. Submitted December 16, 1910.

1. That a state tax of two-tenths of a mill be levied and collected annually for a period of twenty years for carrying on the work of the state board of forestry.

2. That a more rational method or taxing timberlands be adopted so that it may be practicable for owners to hold growing timber on lands not primarily valuable for agriculture.

3. That an efficient system of state fire patrol be organized under the charge of the state board of forestry, and that the burning of slashings be under the charge of the same board.

4. That the cost of this system be defrayed in the first instance by state funds under the charge of the state board of forestry, and that so far as practicable the cost of the protection of forest lands, privately owned, be charged back to the owners of such lands.

Democratic State Platform of September, 1910.

The democratic party favors the conservation of all the natural resources of the state for the benefit of the many instead of the few. We believe that the resources of the state are the heritage of all and should be conserved for the benefit of all.

Republican State Platform of September, 1910.

The conservation of the natural resources of soil, forest, mines, and water power and the settlement of the uncultivated lands suitable for agriculture, are the foundations of the prosperity of the state. We pledge legislation that shall encourage the earliest and highest development of these resources, while we claim all the rights of the people in them. A general law should be passed outlining a comprehensive plan for the development and operation of water power plants and providing proper restrictions under which water power franchises may be obtained, to the end that all persons holding water power rights may be subject to the same general law. Private monopoly should be controlled by the leasing of water power on limited permits subject to regulation and valuation compensation. Prompt action should be taken to complete the forest reserve as soon as practicable and to preserve our forests from destruction by fire.

Address of Gifford Pinchot before the American Forest Congress, held at Washington, D. C., in January, 1905.

The National Forest Service has three principal objects. First, it is responsible for the general progress of forestry in the United States among the people at large, so far as the national government is concerned. This work rests upon the fact that in a government such as ours no movement can be permanently successful unless it is based on a general public recognition of its importance and utility. Since, therefore, it is essential to the well-being of the nation that its forests should not be destroyed, the first duty of the Forest Service is to place that fact clearly before the people . . . .

Not only are the forest reserves in general for use, but every individual resource is likewise to be used, under the single restriction that it shall be so used as to become permanent. Timber, water, grass, minerals, are all to be open to the conservative and continued use of the people. They must be used but they must not be destroyed . . . .

The extension of the present forest area, by restocking cut-over lands and by making plantations where there are no forests, is one of the chief duties of the present moment. This will be accomplished by the helping the States to formulate their own policies, by active co-operation in studying the local situation in each, and by recommending the best procedure under the conditions that

are found to exist. In particular, the farmers in every section of the country must be aided, either to develop their woodlots or to plant trees upon the prairies.

Speech of Henry S. Graves, Chief Forester of the United States, at the Conservation Congress at St. Paul, Sept. 5—9, 1910.

It is not my intention in this address to dwell at length on the fundamental importance to the country of forest conservation. To those who know the needs of the people for forest products, the available resources, and the manner in which ther are now being used up and destroyed, it must be clear that we are facing a problem which must be met with prompt and vigorous action.

A survey of the forest resources of the world shows clearly that in the long run this nation must be dependent chiefly upon its own supplies. Those who believe that we may destroy our own forests and then draw upon foreign resources of timber are ignorant of the facts, for those supplies will not be long available. Foreign countries will need for their own use what they can produce, and many of the exporting countries are exhausting their forests just as rapidly as America. The timber supply in this country is being rapidly depleted. We are extravagant in our use of forest products; there is waste in logging and manufacture, and the loss by fire is a shame to the country. To offset this reduction of merchantable resources the annual production of timber by growth amounts to much less than one-third the average quantity used and destroyed. In other words, we are actually using up our forest supplies.

PROPOSED FOREST PROTECTIVE LEGISLATION.

All thinking people realize that the wonderful forest wealth of this country cannot be conserved through wise use until the government, the states and private owners are willing to spend the large sums that will be necessary to stop the annual and appalling loss from forest fires. This country is growing out of its irresponsible boyhood days, with its reckless waste and utter disregard for the future, and as it has grown older, and as elbow begins to rub elbow with the enormous increase in population, we are beginning to learn a truth long known in older countries, that the state in order to do its duty to all its citizens must use its general police powers much more freely than in the past, and that the selfish interest of the individual must give way to the infinitely greater good of the whole people.

The United States census of 1900 gave Wisconsin the proud position of ranking first among all the states in the production of lumber. The census of 1910 will show that Wisconsin has fallen back in these ten years to eighth place, and that her production of lumber in the same period of time has decreased 40%, which is more than that of any other state. The wood using industries of the state, not counting the sawmills, use annually over 930 million board feet of lumber, valued at $20,000,000, but the state will lose these industries, and many others even more important, as sawmills, paper and pulp mills, etc., unless all forms of needless waste are stopped, and certainly forest fires are the most useless and needless forms of forest waste.

The Lake States Forest Fire conference, held in St. Paul December 6th and 7th, 1910, proved that the severe fire losses of 1910, following the even greater losses of 1908, have aroused us all as never before, and if our legislature can truly appreciate the situation, they will not fail to act. Let us see what the fire losses have been in Wisconsin.

In 1908, according to the reports of our fire wardens, 1,200,000 acres were burned over, and the loss in timber and young growth amounted to $9,000,000. For 1910 our reports, which are not

fully complete, show that 892,833 acres were burned over and the loss in timber and young growth amounted to over $5,000,000, thus making a total loss for 1908 and 1910 of $14,000,000 or enough to pay for an adequate forest fire patrol for 45 years. The direct loss of merchantable timber, however, is not by any means the most serious in its lasting results, but rather the loss of the industries that depend upon the forests for their raw material, and the still greater ultimate loss through the destruction of young, growing timber, upon thousands of acres, which are burned over every year. Wisconsin has a wealth of fertile land awaiting cultivation, but she also has large areas more valuable for forest growth, and the people of our state do not as yet begin to appreciate the great future value of the young timber upon such lands, and the careful protection that such small timber needs. Mature merchantable timber that is burned can often be cut and so saved, but young timber when burned is almost always a total loss.

At present Wisconsin has the following system of town fire wardens: The State Forester is authorized to appoint as many fire wardens in each organized town in the state as he deems necessary, and we now have over 500 fire wardens in the northern or forest portion of the state. These fire wardens post notices, have authority to call upon any person to assist them in fighting fire, are given the same authority as sheriffs to arrest without a warrant, and when in their judgment a dangerously dry time exists, and it is unsafe to set fire for clearing land, or for any other purpose, they have the authority to post special warning notices, forbidding the setting of any fires. The fire wardens, and the men called out by them, are paid by the town boards for the time that they actually serve, at a rate not exceeding 25 cents per hour, but the total amount that can be expended annually is limited to $100 per township, or 36 sections. It will be noted that the fire wardens have a considerable amount of authority, and as the best available men, irrespective of politics, have been appointed, they have put out thousands of small fires and thus averted much heavier losses, but the whole system is faulty from the fact that it is based upon the plan of putting out fires after they occur, while it is now becoming a well known truth that the greatest efforts in forest protection should be centered upon fire prevention.

It must have been an old forest fire fighter who coined the ex-

pression "An ounce of prevention is worth a pound of cure" and probably he had seen as we nearly all have, a small neglected blaze fanned and spread by the winds until it became a fire of such proportions that men were powerless before it.

The present limit of expense in fighting fire of $100 per township is absolutely inadequate in very dry years, such as 1908 and 1910, and the time when the wardens are needed the most is not the time to have the financial cog of the system break down.

Theoretically, the plan of allowing fires to be set at any time, except when the local fire warden posts notices forbidding any fires, is correct, for it imposes the least possible interference with individual rights and especially the clearing of forest lands by settlers in order to make farms, which is of course so necessary, provided it is done at the proper time, and in the proper manner, so as to avoid the wide destruction of the past. Such enormous damage has been done in Wisconsin during the last six years, through fires set by settlers in clearing land, and it is so difficult to secure convictions as the settler can merely claim that he did not see the special warning notices forbidding the setting of fires, that we feel we have the cart before the horse and that a radical change in the law is demanded.

We must prevent as far as possible the starting of forest fires, and therefore the State Board of Forestry of Wisconsin has decided to urge upon our legislature the great importance and necessity of providing a forest fire patrol in northern Wisconsin, upon the following lines:

A Chief Forest Fire Patrol, appointed by and under the supervision of the State Board of Forestry, with headquarters at some central point. He should be a practical woodsman, with a wide knowledge of the northern part of the state, and the ability to handle men. He should be supplied with an office and such clerical help as may be necessary.

In each of twenty-two or more of the northern counties, there should be located at some central point a Head County Fire Patrol, in charge of the work in his county. He should be under the direct orders of his chief, report to him weekly, be obliged to keep one or more saddle horses, and should cover every part of his county at stated intervals.

Under the direct supervision and orders of the Head Patrols in each county, would be County Forest Fire Patrols, varying in number according to the size of the county, and the amount of

forest land to be protected, but sufficient in number so that each man would not have over 40,000 acres of land to patrol. For the twenty-two northern counties that it is proposed that the patrols shall cover, it is expected that at least 322 men will be required. The plan is that all these men shall be secured from lumber companies who operate only in winter, as thus their best men would be given work every summer, the state would secure the services of trained woodsmen, and both the state and the lumber companies would gain the great advantage of having permanent men upon whose ability they could count. Each county patrol would have a given territory to look after, for which he would be responsible, would live in a cabin or shack, and whenever possible would be mounted, so as to patrol quickly, and get to a fire with the least possible delay. The county patrols should be instructed to at once call upon every settler in their territory, explain the fire laws thoroughly, and in every way try to make the settler appreciate that they are working for his interest and want his hearty co-operation.

As soon as funds are available, telephone lines should be built to connect all the patrol camps or cabins, so that the head patrol could call all his men together at any point in the county to fight fire, and wherever possible watch towers should be built, where men would be stationed in dangerously dry times to immediately report signs of fire in any direction. Such watch towers have been built by the lumbermen in Maine and have proved very useful.

During wet seasons when there is practically no danger from forest fire, the head patrol in each county should call his men together and clear up old logging roads, logging railroad rights of way, trails, etc., so that they could be used as fire lines. This is very important as our experience in fighting fires for the last few years has proved over and over again that the men are seriously handicapped in checking fires promptly, from the fact that there are so few roads that are kept clear of brush, and therefore they have no fire line to fall back upon in case of necessity. Much good can also be done by felling old snags, which are the means of spreading fire to a great distance in a heavy wind, and also by burning at favorable times heavy and dangerous slash where it is a constant menace to adjoining timber or other property.

In this connection it should be noted that it is proposed to include in the law an important provision giving the State Board of

Forestry power to order the burning of dangerous slash, so as to provide a reasonably wide strip next to adjoining property that is menaced by such slash, and that if the owner of the land or the timber fails to comply with the order of the Board within a specified and reasonable period, the State Board of Forestry shall burn such slash, the cost thereof to be a first lien upon the land or timber. If the state of Wisconsin is not to have a general slash burning law, it is absolutely necessary that the state, through some board or commission, should have the right to determine when and where slash is such a public nuisance that it must be destroyed. In this way eash case can be carefully considered and the law, if enforced fairly and efficiently, should be a very effective means of forest protection.

One of the most important provisions of the proposed law is to provide that no fires shall be set by any one from April first to December first (except for warming the person or cooking food) without a written permit from a patrol or fire warden. This would mean that any fires set for the purpose of clearing land, burning brush or slash, without a written permit, would be absolute evidence of violation of the law, sufficient to secure conviction. The objection may be raised that the settler is obliged to use fire very freely in order to make a farm on land covered with young timber, brush and slash. This is of course true, but our records of forest fires in Wisconsin for the last six years show that from 40 per cent to 70 per cent of all the fires have been caused by settlers burning brush. A large proportion of the settlers in the forest regions of the state are grossly negligent in the use of fire, and often apparently indifferent to the damage they may cause to the property of others. They frequently select the driest and most dangerous times to start their fires, and fail to take reasonable precautions to prevent the fire spreading.

Under the proposed plan, the local patrols and fire wardens would be authorized, as agents of the State Board of Forestry, to issue permits to set fire when it was safe to do so, and the patrols would be instructed to assist new settlers by showing them how to burn safely and be directed to use their authority reasonably, so as to secure the co-operation of the settlers. Campers, hunters and fishermen must be allowed to build fires at any time, as this is necessary both for cooking and warmth, but the patrols should keep in close touch with all such parties

and arrest them promptly for leaving a camp fire unextinguished.

It will be noted in this proposed plan that the patrols are intended to prevent in every possible way the starting of fires. They will, of course, be a well organized body to fight fires when they occur, but their first and main duty will be to prevent fires starting. However, under the best possible system some fires will always occur, and in order to have an auxiliary force, under the direction of the patrols, which they can call in time of necessity, it is proposed to appoint county fire wardens and do away entirely with the present system of town fire wardens. Many of the town boards have seriously handicapped the work of the wardens by failing to promptly pay the wardens, and the men called out by them. Men will refuse to fight fires if they are obliged to often wait a year for their pay. Most town boards are also strongly averse to allowing any pay if their wardens help to fight fire in adjoining towns, though such fires may at any time destroy much valuable property in their own town. Therefore, it is necesary in order to secure good results to appoint the wardens for the county, instead of the town, and give them full authority to fight fire anywhere in their own or adjoining counties. The present limit of $100 per township, or 36 sections, for fighting fire is entirely inadequate, and therefore it is proposed to increase the limit that any county may expend in any one year to $300 per township. Thus, if a county contains 20 townships it could expend a total of $6,000 in fighting fire, but it should also be provided that the county board of supervisors could exceed this amount in cases of great necessity.

In order that the fire wardens and the men called out by them shall be paid promptly, it is proposed that the state shall pay the men and collect the expense from the counties. The patrols should keep in close touch with the wardens and arrange with them as to the men who should be called out in case of fire, and thus build up a well trained organization for the control of forest fires.

Wisconsin now has a forest reserve of some 340,000 acres, largely upon the headwaters of the Wisconsin and Chippewa rivers, but in order to protect this important watershed, preserve this beautiful lake region as a summer resort for the citizens of Wisconsin, and other states, and also to have a forest reserve large enough to be a factor in supplying the wood using industries of the state with timber, the State Board of Forestry

will urge the necessity of acquiring a forest reserve of approximately 2,000,000 acres. The land must be purchased and in order to raise the necessary funds for the creation of an adequate forest reserve, including its protection and improvement, and also to pay for the fire patrol system in northern Wisconsin, the legislature will be asked to grant the State Board of Forestry the proceeds of a 2-10 of a mill state tax for a period of twenty years. This general state tax will yield a yearly revenue of approximately $600,000, and it is estimated that the cost of the patrol system will amount to $250,000 per year. However, the amount which may be expended in the patrol system should be extremely elastic in order to meet varying conditions, and the forestry board should be authorized to expend the entire income of the department if it was found necessary to do so, in an unusually dry and dangerous year.

At first glance, $250,000 may seem a very large amount to expend annually for forest fire patrols, but in the 22 counties which it is proposed to patrol, there are about 13,000,000 acres of wild or unimproved lands, most of which are covered with some kind of forest growth, so that the cost would be from 2 to 3 cents per acre, and if the patrol system is at all successful, in protecting property, the cost will really represent a very low rate of insurance.

The American people as a whole are uncivilized in their apparently stoical indifference to the appalling annual losses from forest fires. The problems involved are tremendous ones, but they can be solved if only the nation, state and individual care enough to devote the hard work and large sums that will be required. The fearful destruction of the forests in 1908 and 1910 leads me to hope that the time of mere talking is drawing to an end, and that now real action to save our forest resources will commence.

A STATE TAX OF TWO-TENTHS OF A MILL FOR FIRE PATROL AND PURCHASE OF FOREST RESERVE LANDS.

Both the special legislative committee on water powers, forestry and drainage, which was appointed in 1909 to investigate these subjects, and the state conservation commission, recommend that an annual state tax of 2-10 of a mill be levied and collected annually for a peirod of twenty years, and that the State Board of Forestry is authorized to use the proceeds for a state forest fire patrol, and for the purchase of lands to be added to the state forest reserves and for their protection and improvement.

In 1905, through the enactment of chapter 264, the state took the first step towards a broad and comprehensive policy to gradually acquire adequate forests reserves at the headwaters of the most important rivers of the state. This law withdrew from sale and set aside for forest reserve purposes all state lands north of town 33, and the most effective provision of the bill was that the State Board of Forestry might dispose of the agricultural and scattered lands, not suitable for forestry, the proceeds of such sales to constitute a "forest reserve" fund to be available for the purchase of lands to be added to the forest reserves.

The state lands north of town 33 that remained unsold in 1905, were so badly scattered that they could not be systematically managed as forest reserves, or adequately protected from fire and timber trespass. The State Forester, therefore, after examining the lands and consulting with the higher officers of the U. S. Forest Service, recommended to the State Board of Forestry that the main forest reserve be located in the wonderful lake region, lying at the headwaters of the Wisconsin and Chippewa rivers in Oneida and Vilas counties, and that the agricultural and scattering lands in other counties should be appraised and sold, at public sale, at such times as the lands and timber could be disposed of to the best advantage. In 1905, the state lands in Oneida and Vilas counties comprised 50,347 acres, and

up to January 1st, 1911, the State Board of Forestry has purchased 62,919 acres in these two counties, so that the present acreage is 113,266 acres. In addition to these lands there are some 35,427 acres in Forest county, 29,910 in Iron county, and 27,474 acres in Price county, most of which will be retained within the permanent reserves, so that the foundation of our future forest reserves is now 206,077 acres. There remain some 91,492 acres of agricultural and scattered lands to be disposed of in other counties, and they are being offered for sale.

The sale of these remaining lands, however, will not begin to provide sufficient funds to purchase the lands that it is absolutely necessary to procure in order to block up the reserves and thus make forestry management possible. As previously stated, the lake region in Oneida and Vilas counties, at the headwaters of the Wisconsin and Chippewa rivers, is very unusual in the number, extent and beauty of the lakes. Those lakes also have a very important economic value, for if the forest growth upon their watersheds is protected, and some of the lakes also used as reservoirs, the flow of the rivers rising in this region can be made remarkably uniform, and thereby the value of these rivers, both in the development of power and for any possible future needs of navigation, will be assured to the people of the state for all time.

But this lake region, which is such a valuable asset to the state, cannot be protected until the necessary lands are acquired and placed under forestry management. The cut-over lands that are adjacent to, and mixed in among, the state's holdings, owned largely by non-residents and uncared for, are a serious and constant menace to the forest reserves, as they are the source from which start many of the destructive forest fires. The truest economy on the part of the state will be to acquire these lands as soon as possible, so that the young growth that is coming up may be protected and denuded lands reforested.

The State Board of Forestry has secured the 62,919 acres, already purchased in this region, at the very low average price of $2.50 per acre, but timbered lands, which should be secured to protect the shores of the rivers and lakes, and which will prove to be most profitable investments, cannot, of course, be purchased at such a low figure. The Board has, during the past five years, examined the areas that should be purchased and it has been found that the state should own and control at least

2,000,000 acres in forest reserves. It is the intention to appoint forest rangers who will live in the reserves, act as fire patrols to prevent the setting or spread of forest fires, build fire lines, roads and trails, plant areas that have been denuded, and scale the mature timber that is cut from reserve lands by the purchasers.

As stated, the lands necessary to block up the reserves should be purchased as soon as possible, and an organization perfected so that the reserves shall be brought into condition to yield an increasing revenue to the state. Therefore there is urgent necessity for the passage of the bill introduced in the legislature of 1909 as No. 502, S., so amended as to provide a state tax of two-tenths of one mill for each dollar of the assessed valuation of the taxable property in the state, to be collected annually for a period of twenty years, the tax when levied and collected to constitute "a forestry investment fund," to be used for the purchase, improvement and protection of forest reserve lands and for a forest fire patrol. Such a tax of two-tenths of one mill will make it possible for the State Board of Forestry to at once enter into land contracts to secure the lands that are needed and to pay for them as the money becomes available.

This may appear to be a large sum to devote to forestry work, but it should be remembered that the purchase of forest reserve lands will be a most excellent investment for the state for the following reasons:

1. The young timber on the reserves will be protected and denuded acres planted so that in future years the state will receive a direct and increasing revenue from the sale of mature timber, which can be cut and removed from time to time, and at the same time improve the character of the forest.

2. Indirectly the state will receive even a greater revenue by retaining industries within the state that will become more and more dependent upon the forest reserves for raw material as the forests are cut off of private lands.

3. In the same way the state will gain an indirect revenue from the preservation and improvement of the water powers, which will be assured by extensive forests at the headwaters.

4. Preserving the forests in the beautiful lake regions of northern Wisconsin will both protect and greatly enhance its present attractiveness as a resort region, for not only the citizens of this state but of the entire Mississippi valley as well. The value of such a resort region is not generally understood, even from the

dollar view-point, but the report of the bureau of labor of New Hampshire for 1905 shows that the resort business yielded in that year over $10,000,000, and the report of the Forest, Fish and Game commission of New York for the same year states that it was over $7,000,000.

If we protect our lakes, rivers and forests in northern Wisconsin, they will attract summer visitors from all over the country, and not only will the settlers have a near and ready market for all they can raise, but a large amount of money will be paid to hotels, boarding houses, resorts, guides, etc.

It will also be desirable to set apart a portion of the reserves as a bird and game preserve.

As will be noted from the following statements both New York and Pennsylvania through generous annual appropriations are rapidly acquiring splendid forest reserves, which they appreciate are investments that will constantly increase in value.

NEW YORK.

Forest Reserve Lands.

Purchased, 1907	46,156	acres
Area, 1908	1,548,450	acres
Purchased, 1908	63,367	acres
Area, 1909	1,611,817	acres
Purchased, 1909	43,943	acres
Total	1,655,760	acres

Appropriation, 1908, for purchase of lands, $603,516.

PENNSYLVANIA.

Forest Reserve Lands.

Area, 1904	549,563	acres
Area, 1906	701 297	acres
Contracted for in 1906	100,000	acres
Total	801,297	acres

Appropriation for 1907 and 1908, $600,000.

WISCONSIN WOOD-USING INDUSTRIES.

The following is a very brief and necessarily incomplete outline of the report on "Wisconsin Wood-Using Industries" prepared by Franklin H. Smith and H. S. Sackett of the Federal Forest Service, in co-operation with this department. The complete report can be secured from the State Board of Forestry, Madison, Wis.

INTRODUCTION.

The importance of Wisconsin as a lumber producing and a lumber consuming state has been long apparent, as evidenced by the industrial data gathered for the entire country, though less information concerning the consumption of forest products in the state has been gathered than in the matter of the production. For several years the commonwealth, through the agency of the State Board of Forestry has been urging protection of its forest lands as well as reforestation for the purpose of prolonging the life of the lumber business and increasing the number of industries wherein wood in its various forms enters exclusively or partially into the manufactures. Data showing the number, character, and variety of the products of the wood-using concerns located within the state, and the expenditures for raw material for these products, were not available, and it was with the view of compiling and publishing these data that the State Board of Forestry entered into co-operation with the Office of Wood Utilization of the United States Forest Service for the purpose of collecting them.

Statistics covering the production of lumber and other products of the saw mill and woods of the United States are compiled and published annually by the bureau of the census in co-operation with the Forest Service. In 1860 Wisconsin ranked seventh in the list of states arranged according to the quantity of lumber produced. Ten years later fourth place was occupied, third in 1880, second in 1890, first in 1900 and 1904, second in 1905, third in 1906, and fifth in 1907 and 1908. For the last mentioned

year, figures were furnished by 899 sawmills in Wisconsin, reporting a total production of 1,613,315,000 board feet, or 4.9 per cent of the total output of all the mills in the country. Though showing a decrease in production in comparison with the figures of the preceding year, 1907, Wisconsin retained its relative position among the states for production. The cut of white pine in the state has decreased largely in the last few years, though this loss in production has been offset by the increased output of hemlock and hardwoods. The state ranked second in the cut of white pine, first in hemlock, third in maple, first in birch, basswood, and elm, fifth in ash, and second in tamarack in 1908.

In view of the position of the state as a producing territory, the reports of the wood-using industries should be of much value both to lumber manufacturers and lumber consumers. The figures given in the report indicate the volume of each kind of wood grown both in and out of the state which is used by wood-consuming factories. A comparison reveals the importance to the dependent industries of perpetuating the home supply.

In the report consideration is given only to the use of lumber which by machinery or some other process has been changed in form either wholly or in part from the rough material. No effort was made to embrace in the report that volume of lumber which by mere shaping by hand or tool becomes a part of a structure without first having passed through some stage of manufacture. While sash, doors, blinds, and interior and exterior finish might possibly be construed as an integral part of a building, these products for the purpose of the report have been included as finished manufactures.

Individual reports were asked from all wood manufacturing plants listed in current directories, and this work was followed by personal requests for information where such action became necessary. Generally, the data was furnished without hesitation on the condition that no publication of the figures would be made in such a manner as to reveal the business of any concern.

An attempt was made by providing space on the inquiry form used to collect the data, to ascertain from the manufacurers what methods were employed to utilize waste material. Presumably the difference of opinion which exists as to what constitutes waste, resulted in so few definite replies. Reports received from many manufacturers would indicate that the small pieces left

after lumber is cut up at the factory and which are used as fuel are not considered as waste, though it is open to question whether closer utilization of lumber and the use of some other fuel would not prove more economical. The growing employment of dimension stock in furniture and chair factories and by the makers of vehicles and agricultural implements has done much toward lessening the waste at the consuming end. However, inspections made in various factories show a waste of from 5 to 35 per cent of the total volume of lumber consumed, and a conservative estimate places the average waste at 20 per cent. It is believed that this proportion of waste of raw material in many factories could be reduced by working up the cuttings which now go into the firebox or disposing of the material to some manufacturer who is in a position to utilize it in turning out a product of smaller size. The introduction of box factories as adjuncts to sawmills has materially decreased the waste of lumber at many mills.

As an illustration of how large concerns are utilizing what has heretofore been considered waste, the case of a prominent concern in its operation of a sawmill and chemical plant may be cited. After the timber suitable for manufacturing lumber is cut on the tracts owned by the company, all the small and defective hardwoods are felled and together with the tops of the trees down to a 1½ inch limb are cut into lengths easy to handle and hauled to the chemical plant. The wood is then treated and from one cord is secured 60 bushels of charcoal, 10 gallons of wood alcohol, and 145 pounds of acetate of lime. Not only does the company enjoy a source of income from this phase of utilization, but the removal of the slash does much to prevent fires and promotes reforestation or settlement to agriculture as desired.

Through the establishment of the Forest Products Laboratory at Madison, Wisconsin, plans are being worked out by the State Forester for an extended inquiry into the closer utilization of waste, with a view of increasing the profits of the lumbermen and the saving in cost of raw material to the various industries. The faculty of the University of Wisconsin contemplate introducing courses in the training of young men in wood utilization so that within a few years men having intimate knowledge of the qualities and uses of woods may be at the service of the manufacturers.

The State Board of Forestry expects to supplement at an early date the data which has been gathered in this report, by a census of the standing timber in the state. With knowledge of the needs of the manufactures and knowledge of the timber resources, a rational forestry policy can be outlined so that the producing and consuming industries dependent on wood may be perpetuated and enlarged. Not only is it desirable to conserve the forests of the state for their products, but to secure forever the maintenance of the immense water powers on the Wisconsin, Chippewa, Eau Claire, Fox, Menominee, St. Croix, Wolf, and other rivers through the protection of the watersheds.. It has been shown by recent investigations carried on by engineers that the water powers of the state approximate one million horsepower, developed and undeveloped—a tremendous natural resource that means much to the commercial life of the commonwealth.

Wood-Using Industries of Wisconsin.

Chiefly by reason of its proximity to raw material, its excellent shipping facilities by rail and water, its geographical position in relation to consuming markets, and the existence of skilled labor, Wisconsin assumes an enviable position among the states wherein wood forms a large part of the manufactures. An inquiry into the wood-using industries of the Badger state reveals the fact that more than 930 million board feet of lumber valued approximately at $20,000,000 is utilized annually in the numerous lines of manufacture carried on. This is but part of the lumber industry of the state, as the figures given do not include the vast volume of material turned out by the sawmills as well as other forest products which are not considered as raw material for further manufacture. The value of the raw material only is set forth; were the labor expended upon it and the cost of other materials with which the lumber is combined, included, however, the total value of the finished products would soar into additional millions. Of the 930 million feet reported, a little more than one-half of that quantity originated in the state. The figures by no means represent the total amount of wood used, as finished products such as staves and heading used by the cooperage trade and complete wheels and gear used in assembling carriages and wagons were not included in the investigation. Neither was there included in the totals the heavy volume of

lumber that goes into flooring, ceiling, siding, and other products of the planing mill.

Forty species, some native to foreign countries alone, are shown in Table I, which follows, exhibiting the quantity of each wood used, the total cost at the factory, and the per cent grown in and out of the state.

TABLE I.—KINDS OF WOOD USED, QUANTITY OF EACH, WITH TOTAL COST AND THE PER CENT. GROWN IN THE STATE AND OUT.

Species.	Feet used. B. M.	Cost at factory.	Grown in Wisconsin. (Per cent.)	Grown outside of Wisconsin. (Per cent.)
Spruce	164,458,000	$3,123,593	28	72
Western Pine	79,220,000	2,484,155	.....	100
Oak, red and white	55,349,000	2,259,691	29	71
White Pine	101,029,000	2,051,020	71	29
Hemlock	150,698,000	1,814,405	67	33
Basswood	77,054,000	1,444,612	90	10
Birch	75,181,000	1,316,139	88	12
Maple	49,786,000	1,125,356	52	48
Elm	38,180,000	881,346	77	23
Yellow Pine	21,099,000	638,369	.....	100
Ash	14,249,000	377,194	80	20
Cypress	9,679,000	352,948	.....	100
Oak, quartered	5,005,000	342,092	10	90
Hickory	5,075,000	311,225	.....	100
Poplar	13,112,000	306,220	61	39
Balsam	26,090,000	286,329	55	45
Cottonwood	5,804,000	256,217	.....	100
Douglas Fir	5,002,000	180,815	.....	100
Norway Pine	7,505,000	124,350	84	16
Beech	6,431,000	106,485	43	57
Western Spruce	3,287,000	101,319	.....	100
Gum	3,497,000	85,385	.....	100
Chestnut	2,868,000	74,206	.....	100
Mahogany	560,000	71,955	.....	100
Jack Pine	5,150,000	58,850	76	24
Tamarack	2,480,000	25,924	90	10
Tupelo Gum	855,000	20,075	.....	100
Spanish Cedar	105,000	17,990	.....	100
Cedar	310,000	11,140	63	37
Cherry	153,000	10,160	.....	100
Butternut	610,000	9,230	100	.....
Walnut	72,000	5,360	.....	100
Redwood	113,000	4,740	.....	100
Sycamore	155,000	4,240	.....	100
English Oak	10,000	3,500	.....	100
Red Cedar	40,000	2,109	.....	100
Circassian Walnut	5,000	1,750	.....	100
French Walnut	5,000	1,000	.....	100
Willow	100,000	970	100	.....
Rosewood	1,000	500	.....	100
Total	930,382,000	$20,293,034*	51	49

* The average price per thousand feet for all the lumber reported was $21.81.

Table I shows that of the 930,382,000 feet used, at a total cost of $20,293,034, 51 per cent of the total quantity, or 474,494,820 feet, was cut from the forests of the state and 49 per cent, or 455,887,180 feet, was cut in other states or countries. When the figures on the quantity grown in the state and out are considered in connection with the position Wisconsin holds in comparison with other lumber producing states, a discrepancy seemingly appears. However, it is partially explained by the fact that 72 per cent, or 118,204,000 feet, of spruce (Picea mariana) and 79,220,000 feet of western pine used, is credited to the volume of wood cut in other states, and which greatly swells the total amount of lumber imported into the state. The term "western pine" as given in the table includes the several species of pine grown in the Rocky Mountain and Pacific Coast states, and embraces the true western white pine (Pinus monticola), the sugar pine (Pinus lambertina), and the western yellow pine (Pinus ponderosa), it being impracticable to segregate them under certain commercial conditions. While Wisconsin produces sufficient white pine to meet the needs of its manufactures, the cheapness of the western pine and its quality has resulted in its wider use, particularly in the sash, door and millwork industry. Of the native woods, 67 per cent of the hemlock, 90 per cent of the basswood, 88 per cent of the birch, 52 per cent of the maple, 77 per cent of the elm, 80 per cent of the ash, 100 per cent of the butternut, and 84 per cent of the Norway pine used, originated in the state. As a matter of fact the manufacturers of the state draw their supplies of lumber from every section of the country, freight rates permitting the stock to be turned into finished products and these products shipped in many instances into the same sections from which the material was drawn.

THE TAXATION OF FOREST LANDS IN WISCONSIN.

The following is a synopsis of the exhaustive report prepared on this subject by Alfred K. Chittenden and Harry Irion of the U. S. Forest Service, in co-operation with the State Board of Forestry, and with the assistance of the State Tax Commission. The complete report will be published and can be secured from the State Board of Forestry.

INTRODUCTION.

On the initiative of the Wisconsin State Board of Forestry the Forest Service of the United States Department of Agriculture in April, 1910, entered into a co-operative agreement by the terms of which it was to undertake a study of forest conditions in the state of Wisconsin.

The main purpose of the study was to determine the extent of the burden now carried by timberlands as a result of the present methods of taxation, and what influence, if any, such methods of taxation have or will have on the practice of forestry by private owners.

That the perpetuation of this country's forests, and their management along conservative lines, is an object of grave concern to the nation and to individual states, and a proper subject of legislation, all admit. Nor will it be denied by those having a proper regard for the future, that the time has arrived when affirmative action must be taken if this end is to be attained. Every day of delay lessens the chance of success.

Forest conservation by private owners depends primarily upon one point: Does it pay? If forestry can not be made to pay without granting it special favors it has no place in the business world of today. The two great obstacles to the practice of forestry by private owners are forest fires and an unjust and unequal system of taxation. Without proper control of the forest fires that yearly run over the cut-over lands, no private owner can hold his cut-over lands for a second cut. Without a fair system of taxation no private owner can hold his cut-over lands

and give them adequate fire protection in order to get a second cut of timber. With a fair system of taxation, owners of timberland will be better able to protect their cut-over lands from fire, and can, perhaps, afford to hold these cut-over lands for future timber production.

A study of forest taxation has already been made in New Hampshire, and the report has been published by the Forestry commission of that state in its biennial report for the years 1907–08, but up to the present time no such study has been made in the Lake states. While the general conclusions reached in New Hampshire may in a way be applicable to other states and regions, they can not be applied *in toto*. Local conditions and present methods of taxation, the relative area of forest land, the rate of growth of the forest, as well as other considerations, must be taken into account.

Wisconsin stands fifth in the list of timber-producing states of the Union. In 1907 it was fourth. In 1908 it ranked second in the production of white pine. It is being rapidly drained of timber by lumbering, but timber removed in this way is converted into money and brings about the development of the country. Very large areas in Wisconsin, however, are being stripped of timber in another way—by fire. In 1908 an area of 1,209,432 acres was burned over by 1,435 forest fires. No small portion of this acreage was young growth pine, hemlock, spruce, and hardwoods, some of it nearing merchantable size, while the proportion of mature timber burned was also large. It is estimated that 499,495,791 board feet of merchantable timber were destroyed, worth, at a conservative estimate, $2,996,975. The value of the young growth destroyed by these forest fires in 1908 is estimated at $6,047,060.

Wisconsin is typical of the great region around the lakes. The northern part of the state is largely white pine land; south of this is found a wide extent of hardwood land; and the southern portion of the state ranks with the best agricultural land in the United States. A study of forest taxation, then, in Wisconsin will be applicable to a wide territory, and the conclusions herein reached may be applied to a territory larger than the state alone.

The study was confined largely to the northern part of the state. The southern part is principally farming land, and the value of the soil for farming is greater than it could possibly be for timber production. Practically all of the timber has been re-

moved from the southern counties, and there remain now only scattering bodies of timber included in the woodlots of the various farms. The northern part of the state, however, contains much true forest soil—soil that is too poor, rocky, or sandy to ever be successfully used for agriculture. In many of the intermediate counties, however, the soil is suitable for agriculture and will undoubtedly be so utilized within the next few decades. But the country is comparatively unsettled as yet, and while awaiting the coming of farmers and the conversion of the land into farms, it can and should be used for the production of timber. This applies to counties such as Price and Rusk, where practically the entire county contains excellent farming soil, but where settlement is naturally slow, owing to the difficulty in clearing the land for agriculture. In these counties the standing timber will soon be exhausted, and the timberland owners are now offering much of their land for sale to settlers. There are extensive areas in these counties, however, where the soil is too rocky and poor for farming, and such areas should be kept in timber growth. In the extreme northern counties where the soil is sandy it has no value except for forest growth.

The general conclusions that may be drawn from this investigation are:

1. The actual tax burdens imposed on forest lands of the same value are not uniform or proportionate, as the constitution and laws of the state require, either as between the different counties and towns or between the different taxpayers in the same town.

2. The burden of taxation upon cut-over land is relatively much higher than upon timbered land, although the latter is better able to bear the heavier burden of taxation.

3. The burden of taxation upon farm land is also relatively less than that upon cut-over land in the same towns, although its actual value is far greater. The ratio of the assessed to the true value of farm lands is practically the same as for timbered lands.

4. In general, the laws regarding taxation have not been strictly enforced. That no strong objections have been raised to the taxes on forest land by timberland owners is due to the fact that timberlands have in the past been greatly underassessed, and while the tax rates have been extremely high in many cases, the burden of taxation upon the timberland is just beginning to be felt.

5. In the search for revenue to meet the financial necessities of the towns a strong tendency has recently developed to enforce the law more rigidly, and valuations have in many cases been greatly increased. This increase in valuations is more noticeable upon timbered land than upon cut-over or farming land. The cut-over land is already being assessed at practically its actual value, or even higher.

6. The present law, granting total exemption for thirty years to farmers who have planted their land to timber, is not being taken advantage of to any extent, and there are no records of any advantage having been taken of the old law, now repealed, allowing bounties to farmers who planted shelterbelts.

7. Owing to the great danger from forest fires in the state of Wisconsin, to the length of time required to secure returns from cut-over lands by waiting for a second cut, and to the cost of protection in the meanwhile, forest management is not a particularly tempting investment for timberland owners, especially in view of the fact that cut-over land can be sold to settlers at a good price. For this reason it is believed that the state's forest policy should be greatly extended and strengthened.

8. The fire-patrol system at present in force in Wisconsin, while excellent as far as it goes, is not sufficient to successfully contend with forest fires during any particularly bad fire season. The fire patrol system should, therefore, be greatly strengthened, and non-residents employed as fire wardens if possible.

The work upon which this report is based was confined principally to the northern portion of the state, since it was manifestly impossible to go thoroughly over the entire area. Moreover, the results of an investigation in every county would not have yielded any more complete or reliable data on the tax question than could be obtained by a selection of typical counties. As has been already stated, the southern part of the state is a well-developed farming country, and the question of forest taxation has little bearing there except in its application to farm woodlots. For this purpose one southern county, considered to be typical of many—Jefferson county, was selected, and an examination of that county was made to determine the effect, if any, of the present tax laws on woodlot conditions. For the rest the work was confined to the northern part of the state. Certain counties, however, such as Marathon, are well settled, and there are large areas of prosperous farms throughout. While it is

probably true that a large proportion of this northern region contains soil suitable for agriculture or that dairy farms will be established, yet there are large areas of soil too poor for farming. On such soil timber growth will always be the best crop.

For the purpose of this study ten counties considered typical of the northern part of the state were selected for detailed study. These were Bayfield, Douglas, Florence, Forest, Iron, Marinette, Price, Rusk, Sawyer and Vilas counties. While all the information possible was collected in the other counties of the state, the principal work was confined to these ten counties.

CUT-OVER LAND.

About 60 per cent of Bayfield county, 95 per cent of Douglas county, 50 per cent of Florence county, 20 per cent of Forest county, 45 per cent of Iron county, 75 per cent of Marinette county, 67 per cent of Price county, 78 per cent of Rusk county, 65 per cent of Sawyer county, and 78 per cent of Vilas county has been cut over. Or, to express it in another way, out of a total area of 6,518,560 acres for these counties, the timber has been cut from approximately 4,254,000 acres. A large part of the remainder, however, has also been more or less heavily culled over for pine. Much of this cut-over land is owned by land companies who are trying to dispose of it to settlers at from $10 to $18 per acre. In some of the counties, however, some of the larger companies are not selling their cut-over land, although they are not holding it for a second crop. Presumably they are retaining title to it in order to continue in control of the town government, thereby making it possible to keep the taxes on their timbered land at a minimum. Not until they have completed operations will these cut-over lands be placed upon the market. While it is not probable that any great amount of it can be sold to settlers, the lumber companies will have little trouble in disposing of it at from $2 to $4 per acre to land companies.

The bringing into use of this great quantity of cut-over land, the bulk of which is now in a state of idleness and likely to continue so under present conditions, is a problem of first importance. Eventually much of it that is fit for agriculture will doubtless be placed under cultivation. Its rapid appropriation for farming, however, is not probable. Through unfortunate lack of information many of the settlers purchase land that is so poor

in soil that, even after valiant efforts, they fail to develop it, and finally are compelled to let it go. Not infrequently the land is sold to the poor but well-intentioned non-resident without his having had an opportunity to view it. Often, in such cases, the land that he has purchased is not fit for farming purposes, and the result is abandonment. These cases are cited merely to show some of the elements that are tending to defer the early development of that part of the cut-over area which is susceptible of cultivation.

The most serious phase of the problem, however, is to bring about a utilization of the non-agricultural land. It is not worthless land by any means, for it can be successfully used for growing timber. It is essentially a forest soil and should unquestionably be kept under forest growth. At present the greater part of it is nothing more than waste, and what is worse, the owners could not profitably make it a timber-producing property even if they were so inclined. This class of land, as will be shown, is bearing the heaviest tax burden, and more than any other is entitled to consideration in any plan for an equitable adjustment of taxation. It is this land that should furnish a good part of the future local timber supply, and in order that this may be made possible through private initiative, one of the first steps that should be taken is to provide a rational forest tax law.

Annual Cut and Importance of Lumber Industry.

From year to year, as the amount of standing timber is reduced, the annual cut is being lessened. This reduction is slowly but surely wiping out the most important industry in these northern counties. The material welfare of many communities in this region has already suffered from the loss of wood-working industries, and as the forest is further depleted, others must likewise suffer. The present importance of this industry in the ten counties is shown by the 750,000,000 board feet of lumber cut during the year 1908. In addition to this, a large amount of timber was cut in these counties for transportation to mills outside. For instance the mills in Marathon county, where more than 143,000,000 feet were sawn in 1908, depend in a large measure on the more northern counties for their timber supply.

If this important industry is to be even partially perpetuated it will be necessary in some way to encourage the growing of new

forests, and a reform in the method of taxing forest land should play an important part in making it profitable for private owners to take up the work of reforesting their cut-over lands.

Examples of Actual Taxation.

The following are a few typical examples from a large number of cases, comparing the assessed value with the actual value.

On one forty in one of the northernmost counties an estimate of the timber shows 765,000 board feet of white pine and 85,000 board feet of red pine, with a little scattering of hardwoods, mostly birch and maple. The value of the timber is easily $6,715, and the value of the land is placed at a little less than $4 per acre, or $150 for the forty, making a total estimated value of $6,865. The assessed value in 1909 was placed at $3,450, or practically 50 per cent of the true value. The tax rate in this case was .0246.

On another forty the estimated stand of timber is 810,000 board feet of white pine and 90,000 board feet of red pine, with practically no hardwoods in mixture. The stumpage value of the timber is conservatively placed at $7,110 and the value of the land at $150, making an estimated true value for the forty of $7,260. The assessed value in 1909 was $1,200 or 16 per cent of the true value. The tax rate in this case was .0242.

A very large number of forties in this county are assessed at a flat rate of $1,200, which makes a variation of from 16 to 60 per cent of the estimated true value of the forty.

The hardwood land is assessed at about the same ratio to its true value as the pine land. One forty, containing 100,000 board feet of hemlock, 10,000 board feet of basswood, and 160,000 board feet of birch, is estimated to be worth $800 for the timber alone. Adding $150 for the land gives a total value of $950. The assessed value in 1909 was $260 or 27 per cent of the estimated true value. The tax rate in this case was .0338.

One forty in another county has a stand of 540,000 board feet of white pine and 20,000 board feet of red pine. The timber itself is worth $6,680 and the land about $80, making a total value of $6,760. The forty was assessed at $2,418 in 1909 or about 36 per cent of its true value. The tax rate was .044.

Another forty contains 800,000 board feet of white pine which is worth $9,600. The land is worth about $2 per acre, making

a total of $9,680. The assessed value is $2,780 or 28.7 per cent, and the tax rate was .044.

A high assessment appears in another forty which has a stand of 110,000 board feet of white pine worth approximately $1,320. The timber and land together are worth $1,400 and were assessed in 1909 at $1,280, giving a ratio between assessed and true values of over 91 per cent, and the tax rate was .044.

A farm of 160 acres in the western part of the same county has 60 acres of cleared land. It is valued at about $35 per acre for cultivated land and $6 for unimproved land, which makes a total value of $2,700. The assessed value in 1909 was $840, or 31 per cent of the true value, and the tax rate was .044.

Much of the cut-over land in another county is assessed at $80 a forty or $2 per acre. As low assessments as $60 a forty or $1.50 an acre, are found. Such land as is assessed at this latter figure is usually swampy and of practically no value for forest growth when once cut over, owing to the difficulty of getting the land naturally restocked with trees. It is probable that the average value of cut-over land in this county does not exceed $2.50 an acre, and much of it is worth less. Therefore, an assessment of $80 a forty on cut-over land is practically at the ratio of 100 per cent of its true value. There are large areas of cut-over land also that are assessed as high as $200 a forty, and in some cases individual assessments are found even higher. Such assessments are often in excess of the true value of the land. Timbered forties in the county are more or less uniformly assessed at an even figure of $200, $300, $360, $380, $400, $440, or $500. Five hundred dollars is practically the highest assessment on timbered land in the county. In certain townships a flat figure of $260, $340, or $400 a forty will be used for several sections of land.

Assessment of Timber Lands.

The following table illustrates how the taxes on timberland have increased during the past few years. The figures are taken for a number of forties in one of the northern counties. It is seen that a large percentage of increase in tax occurred each year during this period, 1904–1909, with the exception of the last, when a decrease of 77 per cent of the tax of 1908 took place. The increase during each preceding year is explained by

several causes. Probably the increase in the actual value of the holdings through the rise in stumpage is of considerable importance, for assessors are usually quick to raise assessments wherever it is justified. Another factor, which often accounts for increased taxes, is the growth and improvements within the towns, which means greater expenditures and larger taxes to meet them.

These factors operate on all classes of property alike. In the case of timber tracts, however, there has been a growing alarm that, with their depletion, the towns would be deprived of their largest source of revenue. There is everywhere, therefore, a growing tendency to obtain as much revenue as possible from the timber before it is entirely removed. As a result of this policy the timber holder is being forced to stand a constantly heavier share of the community's tax burden and to furnish improvements for the future's needs. Present taxes are thus being used frequently to provide for permanent improvements, the use of which will come mainly in the years to come. The local governments are usually convinced that timber is not taxed as high as it deserves, and, therefore, to provide against a future when there will be no timber to tax, they do not hesitate to raise gradually the tax on timberland.

It certainly can not be denied that there are extensive timber holdings that are or long have been underassessed, and this is especially liable to be the case where the politics of a town have been controlled by the lumber companies operating within it and where, therefore, the assessments are made by the companies themselves. Rapid rises in taxes are very often attributable to the change from such a situation to one where the town gains control of its own politics. This is the case in many towns in Wisconsin which have freed themselves from the control of lumber companies.

Some of the largest drops in taxes noted in the last column are probably due to the removal of the timber on the forty before the end of the 1908 tax year.

Actual Value 1909.	Amount of Taxes Paid per Forty Acres for Years.					
	1904.	1905.	1906.	1907.	1908.	1909.
$705.00	$3.71	$4.80	$11.25	$32.90	$33.06	$23.40
563.00	3.18	3.90	6.75	14.85	24.04	17.16
202.00	2.12	2.70	3.60	7.92	12.02	8.58
1,042.00	6.36	7.20	20.10	31.35	42.07	30.03
632.00	5.04	6.60	10.50	23.10	28.55	20.48
310.00	4.24	5.40	8.70	14.85	18.03	12.87
1,746.00	6.36	7.80	17.25	66.00	72.12	51.48
1,406.00	5.04	6.60	16.80	25.58	39.07	27.89
576.00	3.70	4.80	4.20	26.90	33.66	23.79
538.00	5.04	6.60	13.05	27.06	30.65	21.84
985.00	6.36	7.80	16.50	28.71	45.08	32.18
1,271.00	7.42	9.30	23.55	42.25	49.58	35.30
580.00	6.36	7.80	16.95	47.69	30.05	21.45
1,681.00	6.89	8.70	25.65	45.71	69.12	49.37
46.00	.80	.90	.75	.85	1.50	.98
995.00	6.36	7.80	21.00	36.47	30.05	21.45
1,086.00	6.36	7.80	21.00	30.86	48.08	34.32
1,308.00	6.36	7.80	21.00	52.97	54.09	38.61
790.00	6.36	7.80	21.00	49.67	48.08	34.32
530.00	6.36	7.80	21.00	37.80	30.05	21.45
848.00	7.69	9.60	9.45	21.45	33.06	23.60
1,038.00	6.36	8.10	21.00	49.50	42.07	32.03
1,592.00	6.36	7.80	15.75	39.60	60.10	42.90
1,850.00	6.36	7.80	21.00	94.88	84.14	7.20
1,526.00	6.36	7.80	21.00	47.36	69.12	7.20
1,639.00	6.36	7.80	21.00	47.03	69.12	7.20
1,502.00	6.36	7.80	21.00	43.73	61.60	7.20
1,437.00	6.36	7.80	21.00	39.77	51.09	36.47
1,113.00	6.36	7.80	21.00	46.70	57.10	40.76
1,054.00	6.36	7.80	21.00	43.07	52.59	37.64
317.00	6.36	7.80	13.95	31.35	30.05	7.20
950.00	4.24	5.40	15.15	27.72	42.07	8.10
891.00	6.36	7.80	15.75	21.29	32.45	23.40
1,573.00	6.36	7.80	15.75	45.54	69.12	49.44
781.00	6.36	7.80	15.75	27.89	35.46	25.35
834.00	6.36	7.80	15.75	16.34	25.54	18.33
1,003.00	6.36	7.80	15.75	25.58	37.86	27.30
843.00	4.51	5.70	14.10	23.10	33.96	24.18
624.00	4.24	5.40	9.45	24.59	32.75	23.40
80.00	1.06	1.50	2.25	7.43	1.50	.98
3,642.00	4.24	5.40	52.50	88.28	160.77	114.63
Total $42,129.00	$225.80	$280.20	$631.95	$1,455.69	$1,820.47	$1,0 1.49
Average 1,028.00	5.51	6.83	16.14	35.50	44.40	24.18

Methods of Assessing Timberlands.

Although the law very clearly states that "real property shall be valued by the assessor . . . at the full value which could ordinarily be obtained therefor at private sale," the assessment of timberlands in practically all of the northern counties is made in a most arbitrary manner and with apparent disregard of the requirement of the law just quoted. In only a few of the towns is there anything approaching true valuation in the assessment of this class of property. Timberland as a rule is not only greatly undervalued, but, moreover, the variableness of the ratios of assessed to true values in many towns presents striking examples of inequality in assessment. While in a few towns there has been apparently an attempt to follow a given percentage or fraction of the true value, a close inspection shows a pronounced variation from such percentage or fraction.

The fixing of low values is not considered a violation of the law. Each assessor is likely to take the general figures of his predecessor. He knows also that other assessors adopt a uniform value per acre for all farm and cut-over land and apply it throughout the assessment district, regardless of the land's advantage or disadvantage of location. The assessor is elected to office by the people whose property he is to assess. Then again he may be in the employ of one of the largest property owners in the town, and in passing it should be said that the administration of many of the towns is virtually in the control of the principal property owner therein, and that the assessor is in the employ of such owner while not engaged in the performance of his official duties. All of these conditions tend to encourage undervaluation, and it is believed they are in no small measure responsible for it.

The law also requires that in determining the value of real estate the assessor shall consider, as to each piece, the quantity of standing timber. For an assessor to get a fair approximation of the true value of such standing timber, he must be able to estimate with some degree of accuracy and be familiar with timber values. Many of the assessors do not have these qualifications, and those who do are often prevented from exercising them, except in a limited way, for the reason that the time allowed for making up the assessment roll is not sufficient to enable an assessor to cover as he should more than a part of his assessment district. It should be said, however, that in a few towns they do attempt to see each timber description in at least one or two townships each year. The assessor is accompanied by a lineman to assist in locating the description, and the assessed value is determined at that time. In a strict sense no cruised estimate is made. Such assessments are made each year on lands not previously viewed by the assessor until the entire town has been covered. In other towns there is very little evidence of such systematic work being carried on, although occasionally it will be found that an effort is being made in that direction.

Cut-over land is usually valued at a fixed rate throughout a town, varying only with a very rough classification of the soil as swamp, hardwood, or pine land. As a rule no attention is given to such important factors governing values as proximity to railroads, highways and water. Cut-over pine lands are sel-

dom assessed for more than $2 per acre, while cut-over hardwood lands will rarely exceed $6 per acre. In the extreme northern counties both cut-over pine and hardwood lands may be assessed as low as $1 per acre. Cultivated land in some towns is assessed at the same values as cut-over land. Even in the more developed farming communities the assessed value of cultivated lands seldom exceed $10 per acre, although the sale value in many cases is five times as great.

Instead of an actual examination of timbered land there is more often merely an interview with the owner. In most of the hardwood regions the land is not considered separately. However, when any estimate is made, the land and trees are treated separately. For example, in the one county where practically all the timber is estimated, a value of $2 per acre is always added to the assessed value of the timber. The county just referred to is the only one where it is known that cruises for estimating the timber for tax purposes have been made throughout the county. In some towns the cruised values of a considerable portion of the timbered area, are, of course, known to the assessor, who is either an officer or employe of one of the companies having extensive holdings in the town, but such cruised values are evidently not used in making up the assessment roll. In such cases the assessor uniformly keeps the assessed value as low as possible, not only on the company's holdings but also on all others. In adjoining towns, where the assessor is not so connected with a large owner, it will generally be found that assessed values are higher.

Assessments are lowered when the owner reports that the timber has been removed, and it is, therefore, classed as cut-over land and assessed at the prevailing rate for such land in the town where located. Generally, if not always, the assessor will accept such report as correct and make no investigation to determine whether or not the description has been entirely or only partly cut, with the result that if only partly cut, it is undervalued year after year. No doubt, in many instances descriptions are assessed without taking into account the standing timber thereon. At least a comparison of the assessed and estimated true value of many of the examples given herein would indicate that this is the case. So far as could be learned none of the assessors give any consideration to young growth in fixing values.

While the practice of undervaluation prevails throughout most

of that part of the state now being considered, it should not be understood that this condition is universal. In many localities a conscientious and fairly systematic effort is being made by assessing officers to conform to the law. In a large measure the importunities of the county supervisor of assessment have influenced the assessor in raising the valuation of this class of property; and in many cases, independent of such solicitations from supervisors of assessment, the assessor has endeavored to faithfully comply with the tax laws regarding valuation.

The Attitude Toward Fire.

One of the most serious obstacles to the practice of forestry by the lumber companies, and therefore, to the satisfactory working out of any tax system designed to encourage timber growing is the absolute lack of popular appreciation of the damage wrought to a forest by fire and the callous disregard on the part of many settlers for the state's fire laws. As a result the fire damage throughout this whole region is simply enormous, and the injury to young growth, which is usually not considered, is almost irreparable. A representative of one of the large lumber companies in Price county gave it as his opinion that in this county alone at least 20,000,000 board feet of lumber were annually ruined by fire. According to Mr. E. M. Griffith, State Forester of Wisconsin, the damage to mature timber and property from forest fires in 1908 amounted to fully $9,000,000. Consequently a most adverse feature of this fire situation is that no individual or company can consider forestry methods or hope to obtain reproduction on cut-over land until some adequate system of fire control has been tried and its efficiency amply demonstrated. Very little successs along this line can be expected until the state is willing to provide for a thorough fire patrol during all dangerously dry seasons. As clearly pointed out in the report of the State Forester of Wisconsin for 1908, the present system of fire wardens, while good as far as it goes, falls far short of meeting the actual needs of the situation. Under this system the fire wardens are all local men, and it is not strange that in a great many instances they should fail to take legal action against a neighbor who may have been guilty of breaking the fire law. But the most serious defect in the present law is its failure to provide for fire patrol, which is the one great need of this whole

region. The lumbermen so fully appreciate the urgency for such measures for prevention of fires that they are willing in many cases to form a fire protective association to be maintained by levying an annual assessment on an acreage basis from each member, and having as its primary object an extensive system of fire patrol. Such a patrol should not cost over 2 cents per acre per year, and could be placed directly under the State Fire Warden, by whom the individual local patrols could be appointed and made regular fire wardens. A patrol system of this kind should extend to the other parts of the towns as well as to the holdings of the associated lumber companies, and the towns should be charged for patrol and fire-fighting service within their borders. At present it is left entirely to the discretion of the towns as to how much they shall pay for such services, whereas they should be compelled to settle all accounts for fire fighting or patrol submitted by the wardens and audited and approved by the State Fire Warden.

Another variation of this same plan may be suggested whereby the present town fire warden system should be maintained independently of the lumber companies' patrol, but working in harmony with it under cooperative agreement between the state and the association. In any case it is quite obvious that very limited results can be looked for from tax reform until the fire risk is largely eliminated through adequate legislation and effective enforcement of the same.

Conclusions.

As is clearly brought out in the preceding tables, the present method of assessing forest lands is ridiculously uneven and in many cases unfair to the timberland owner. That it is not ur fair to the timberland owner in every case is no fault of the present law, but is due to the lax administration of the law by the assessors. While considerable cut-over land has been abandoned in the past on account of taxes, little or none is now being so abandoned. The reason for this is not decrease in taxes, because, as has been shown, taxes have increased, but the increased or expectation value of the land itself for agriculture. While forests have in some cases been overtaxed, leading in a few cases to hastening the cut, taxation has not in the past greatly influenced logging operations in Wisconsin. But the fact that it has had little

influence in the past does not mean that it will not have more in the future. The great increase in assessments on forest land in the last few years, coupled with the fact that assessments are still increasing and, more than this, with the fact that under the present tax law they can still increase, makes it inadvisable at present for a private owner to practice forestry on his lands. In such a long-term investment as forestry a private owner must know definitely what the annual charges against his business will be. Under the present system he has no means of knowing how great his taxes will be in 10, 15, or 20 years. In an investment covering such a long period as this, 50 or more years, where fire risk also has to be considered, it is important to know exactly what taxes will have to be paid. Probably nothing discourages investments more than uncertainty as to future costs. And whatever can be said of the present system of taxation, there can be no question of its arbitrariness and uncertainty. If there is added to risks from fire, from insects, from fluctuation in lumber values, and other hazards of forestry, a further uncertainty as to what the taxes are going to be, private owners can not be blamed for some hesitation in starting on an investment that may have to pay taxes for 50 or more years before returns can be realized. And the timberland owner cannot safely figure on the continuance of the present lenient administration of the property tax. As has been shown in this report, the tendency is toward a stricter enforcement of the law, and consequently higher assessments.

The possibility of the practice of forestry by private owners depends on two things—an equitable system of forest taxation and protection from forest fires.

Admitting that the evidence gathered in connection with this study shows that, on the whole, owners are not now excessively burdened by the taxes on their standing timber, it does not necessarily follow that the present method of taxing this class of property is satisfactory. We have seen that in the actual administration of the law every rule of equality and uniformity has been violated, and that precision and certainty have been displaced by arbitrariness and uncertainty. Under these conditions owners can not manage their timber in accordance with approved methods of forestry with a view to holding for a second cut, for there would not be even a semblance of certainty as to what the tax burden of future years would be. On the other hand, if the pres-

ent tax laws were strictly enforced, thereby enabling an owner to determine with a fair approach to certainty the probable amount of taxes he would have to pay in future years, the burden would appear to be so prohibitive that no prudent man would attempt as an investment to protect and care for the young growth with a view to obtaining a second or future cut.

In the past, probably the one thing that has prevented a more wasteful cutting than has actually taken place, and that has saved much of the remaining timber, is the fact that the lax enforcement of the tax laws has kept the burden on timber at a minimum.

The evidence presented in this report has demonstrated that with respect to timbered land the general property tax is administratively unworkable. The problem of forest taxation can never be satisfactorily worked out under it because the system is fundamentally wrong. It is believed that nothing short of a complete readjustment of the present method of taxing this class of property will make possible an equitable solution. Growing timber is so essentially different from the great mass of real property that it deserves different treatment in the matter of taxation. Especially is this true if the state desires to encourage the perpetuation of forest growth and the practice of forestry on privately owned lands. If possible the adjustment should be so made as to promote an adherence to the essential principles of modern forestry among timber owners, and the care and protection by them of young growth both before and after the removal of the mature timber in order that the land might be held for a second or future cut without making it necessary to resort to artificial planting.

It should be said, however, that it is not believed an adjustment of the tax laws, no matter how perfectly worked out and administered, will alone bring about the practice of forestry, except in a limited way, or the extensive growing of timber as an investment, on privately-owned lands. Taxation is only one of the several important factors that at present make the growing of timber commercially unprofitable and consequently unattractive to investors or those engaged in the timber business. The fire hazard, the length of time before returns on the investment commence to come in, stumpage values, and many other less important considerations are factors which many regard equally as deterrent as taxes. While this may be true today, it may not be true to-morrow. The menace from fire is admittedly great, but

the time must and surely will come when it will be reduced to a minimum by the inauguration of more effective measures of prevention and control than now exist. It is to be hoped that the ever-recurring destruction of forest growth from fire will bring about the strictest possible enforcement of the fire laws now on the statute books, and if they are found to be inadequate, then the enactment and enforcement of laws that will reach and remedy this devastating evil. Undoubtedly much can also be done along educational lines toward correcting this evil. With few exceptions all forest fires originate from some agency within human control, and it is therefore reasonable to believe that those exercising such control can by thorough and systematic instruction be trained to exercise the utmost caution in building and caring for fires that by chance are likely to spread to neighboring timber.

The long period that must elapse before there is any substantial return on the investment is, of course, a discouraging feature. Whether it will greatly retard the commercial growing of timber, if all other conditions are favorable, can only be conjectured. Undoubtedly the increase in stumpage values that occurs as the timber supply is gradually diminished will do much to make the proposition more attractive as an investment than it appears to be to-day.

While the introduction of a more equitable system of taxing growing timber may not in itself be a sufficient inducement to cause private owners to engage extensively in the growing of timber commercially, it would undoubtedly be a step in the right direction. That such an innovation would help immensely to stimulate this sort of enterprise and make it much more profitable and attractive than it is at present can not be gainsaid. The change must come sooner or later if the state is to attempt to remedy existing conditions, and there is no apparent reason why decisive action with that end in view should not be taken now. The remedy can not, of course, affect the past or to any great extent the present, but must necessarily be confined to the future. Its aim should be to encourage the growing and proper management of new forests. And although a change for the better in existing conditions may do much to promote the growing of a future timber supply by private capital, it is firmly believed that if the supply is to be commensurate with the local needs, the greatest part of the burden in providing it must and will rest with the state.

In the northern counties there is a great area of essentially forest soil, land that will probably never be susceptible to any use other than the growing of timber. In order to encourage the owners of such land to hold it as a forest property and to apply practical forestry to its management, the enactment of legislation that will include the following provisions is recommended:

1. That any land in the state suitable for timber growing and occupied by a natural or planted growth of trees, or both combined, may be separately classified for taxation, and that when so classified the land and the wood and timber thereon shall be taxed in accordance with the plan set forth in paragraphs 5 and 6.

2. That the determination of the question as to whether or not any land is suitable for timber growing shall rest with the State Board of Forestry.

3. That all applications to have land so classified shall be made to the State Board of Forestry, in manner and form to be prescribed by it, and shall be acompanied by a description and plat of the land and such other information as said Board may require.

4. That if the decision of the State Board of Forestry is in the affirmative, it shall submit to the owner a plan for the future management of the land and trees, and shall certify to the State Tax commission that the land has been separately classified for taxation in accordance with the provisions of the act.

5. That when so classified the land shall be separately taxed annually; that in making the assessment the land shall not be valued at more than $1 per acre; and that in fixing the valuation the assessor shall in no case take into account the value of the growing timber.

6. That whenever any timber or wood is cut from such land the owner shall be required to pay an amount equal to 10 per cent of the gross value on the stump of the wood and timber so cut.

7. That the owner be required before the timber is removed from the land to file with the State Tax commission, a true and accurate return under oath or affirmation of the variety and gross amount and value of all material that has been cut.

8. That the assessment and collection of such tax on the timber shall be in the absolute control of the state, leaving the tax on the land where it is now.

9. That the management of lands so classified under the act shall be subject to such supervision as the State Board of For-

estry may deem necessary to protect the public interest and to insure the proper management of such land and timber.

10. That failure on the part of the owner to comply with any provision of the act or to carry out any instructions of the State Board of Forestry shall be sufficient cause to cancel the certificate classifying the lands for taxation.

11. That where a certificate separately classifying land is canceled for either of the causes mentioned in the preceding paragraph, the owner of the land covered by such canceled certificate shall be required to pay an amount equal to what the total taxes under the general property tax would have been for the period of time the land was so separately classified.

12. That when there is reason to believe that a return is incorrect or where the owner has failed to make a return, the State Tax commission may require from the owner such further information as may be deemed necessary; and for the purpose of ascertaining the correctness of such return or for the purpose of making a return where none such has been made by the owner, the State Tax commission shall be authorized to designate an agent to examine any books or papers bearing upon the matter and to determine the actual amount and gross stumpage value of the timber cut, which determination shall be the basis for fixing the amount of taxes the owner shall pay.

Conditions in Wisconsin indicate that a tax on the yield, together with a nominal annual tax on the land, is superior to any of the various tax laws that have from time to time been proposed. It would be far more equitable, however, if no annual tax were levied on the land, or if levied, to allow the aggregate amount of such taxes, together with interest, to be deducted from the tax on the yield when it is levied. But if such tax were not collected annually, it is probable that the local revenues might be so reduced as to seriously interfere with the fiscal affairs of the community. It is not recommended that the annual tax with interest be deducted from the yield tax at the time it is levied, because it would be simpler, administratively, to offset such annual tax by reducing the rate of the yield tax.

The maximum value at which land shall be assessed is fixed at $1 per acre. In many of the towns cut-over lands are now assessed at that rate. However, in others the rate is much higher, and for that reason it may be preferable to increase the maximum value to $2 per acre. The self-assessment feature of the

proposed law is made with a view to lessening the cost of administration. It would be far more desirable for the state authorities to check in every instance the return of the owner for the purpose of verifying the amount and value of the material cut, and it is recommended that this be done if the cost of such verification is not prohibitive.

If the foregoing plan for assessing woodlots and private forests is adopted, some provision should be made for returning all or a part of the revenues collected by the state authorities to the counties and towns entitled thereto.

What the State Should Do.

Even though a satisfactory adjustment is made of the tax laws so far as they relate to timber, it is none too certain that it would result in promoting the growth of timber by private capital on a very extensive scale. Certainly such remedial legislation can not be expected to assure the future generation of a sufficient timber supply. While a consideration of state forest reserves may be somewhat aside from the subject of forest taxation, it nevertheless deserves mention here because it is believed that only through direct state action can there be a reasonable assurance of a sufficient supply of timber in the future. The state has already made a splendid start in the establishment of forest reserves, and it is to be hoped their extension will be rapidly carried forward. There are extensive tracts of land in the northern part of the state that are essentially forest lands, and it is feared that unless the state takes up the work of reforesting them they will continue as they are now, unproductive wastes.

Of the various plans that might be adopted for the acquirement of these lands by the state, the simplest, least expensive, and most effective method will be for the state to purchase them in the open market. The present plan for raising money with which to purchase forest reserve land, although an excellent one, has its limitations. It will hardly furnish all the funds that will be needed if the state is to do all that it can and should do in reclaiming these lands from their present idleness. By all means the state should immediately provide by appropriation such additional funds as may be needed in carrying forward this important work. Not only should waste and cut-over lands be purchased, but also lands chiefly valuable for the growing of timber

that contain a growth of young or partly mature trees. The purchase of restocked lands would make it possible for the state forest reserves to be revenue producers practically from the beginning.

The perpetuation of a timber supply in the state is so fundamentally important to the general welfare of the people as to make it necessary for the state to at once take affirmative action along the lines suggested, and not rely to any great extent upon private enterprise. At present the great tracts of land in the northern part of the state that are now unproductive, but that should be under forest cover, can be purchased by the state at a comparatively low figure. The longer they remain in their present condition, the more difficult it will be to make them productive as a forest property because the fires that are continually running over them are gradually but surely so impoverishing the soil as to make them eventually valueless for any purpose.

A SOIL SURVEY OF A PORTION OF THE FOREST RESERVE.

During the summer of 1910 at the request of the State Board of Forestry the College of Agriculture of the University of Wisconsin made a careful soil survey of seven townships within the forest reserve area in Oneida and Vilas counties. The area covered included all of towns 38, 39 and 40, range 7 E. and portions of town 43, ranges 5, 6, 7 and 8 E., as it was thought that these townships were fairly typical and representative of the forest reserve area in these counties. Mr. O. P. Bergh had charge of this work under the direction of Professor A. R. Whitson of the College of Agriculture.

The main object of the survey was to determine definitely by means of a careful field examination by soil experts whether the land within these townships was upon the whole suitable for agriculture or whether it should remain as forest land and be included within the reserves.

It was known before the survey that a certain percentage of fairly good agricultural land would be found but the point to be determined was the exact percentage of such land, its total acreage and where located so that it could be determined whether the State Board of Forestry would be justified in inducing settlers to locate upon the land, or if the whole area should be held under forests.

It was found in the survey that it was practicable to distinguish four types of soil in this region. The first is a loamy sand of rolling topography; the second, sand to sandy loam with a rough topography and usually stony; the third, jack pine plain sand; and the fourth, marsh or swamp land. This classification seemed to be the one that would be of the most value under the circumstances, inasmuch as it would distinguish between those areas that might be of considerable value for agricultural use and those that would have relatively little value for such a purpose. The results of the survey give the following approximate percentages for the four types:

1. Loamy sand (possible agricultural land),.....22%
2. Sand to sandy loam (forest land),.....72%
3. Jack pine plain sand (poor agricultural land),.. 4%
4. Marsh or swamp land (forest land),..... 2%

Type 1. This loamy sand soil, which is classed as possible agricultural land, comprising about 22% of the total area, has a gravelly subsoil but is comparatively free from surface rock, and is adapted to truck crops, such as potatoes, and many garden vegetables. Grain crops would do fairly well, and possibly clover and alfalfa might be grown. On the whole, the areas of this type so far as the soil is concerned, are of moderately high agricultural value.

Type 2. This comprises 72% of the total area and the soil varies from sand to sandy loam. The topography is so rough and broken that the land is unsuitable for farming purposes. Much of the land is also very stony and the few settlers who have located upon this type of land are having very little success in their efforts to till the soil.

Type 3. This includes all the jack pine plain sands which comprise about 4% of the total and are classed as poor agricultural lands. The topography is level to gently rolling and the soil, which is a coarse sand, is free from stones, while the subsoil is composed of stratified sand or gravel. It is typical sweet fern and jack pine land.

One settler was attempting to farm this type of soil and the fairly good appearance of his crops, in spite of the dry season, indicates what might be hoped for on this type generally, at least during the first few years after clearing off the timber, though it is highly probable that after a few years of further cropping, its fertility will, to a large extent, be exhausted.

Potatoes, hardy vegetables, early corn and some other crops may be grown, although the very light character and looseness of the soil will make it necessary to use green manuring and other means of adding organic matter, and at best it can be considered of only moderate value for agricultural use.

Type 4. This is marsh or swamp land which forms comparatively small areas along the lakes, and is also found scattered through the other types of soil, and comprises about 2% of the total area. Many of these marshes are now covered with a good stand of tamarack and black spruce, but in time it may be found advisable to drain some of them for agricultural purposes.

Summing up the four types we find that types 2, 3 and 4 aggregate 78% of the total area and are true forest land upon which the state should not encourage settlement. As stated it may in time appear advisable to drain some of the swamp land, but this

type constitutes only 2%, and no drainage should be undertaken in this region until a careful examination has been made to determine if possibly these swamps are not of more value as natural reservoirs, as they absorb an enormous amount of rain and snow water, giving it off very gradually during the dry summer months and thus aid materially in maintaining a uniform stream flow.

Type 1, or loamy sands, comprising 22%, are the only areas that at present should be considered as even possible agricultural land. Such soil has a relatively small amount of organic matter and there is reason to believe that a chemical analysis would show it to be exceptionally low in its content of mineral elements.

As pointed out in this report, there are over 13,000,000 acres of land in northern Wisconsin awaiting development and much of it is the highest grade agricultural soil. There is therefore no excuse for encouraging settlers to locate upon lands [illegible] the best type holds out only a fighting chance for meager success. If settlers should locate upon the 22% of possible, but poor, agricultural land they would be doomed to comparative isolation, and would be deprived of good schools and the many advantages of a growing community.

Wisconsin is so rich in her wealth of undeveloped agricultural lands and the state has so much at stake in the prosperity and happiness of the settlers, that the state should direct such settlement into the proper channels. The settler who locates upon non-agricultural land and finds after years of hard work that he can make only a bare living naturally becomes very much discouraged and almost hopeless. He and his whole family soon begin to degenerate and are a curse to themselves, their community and the state. Such conditions are only too common in many of the sterile sections in the older states, but there is no reason for their occurring in Wisconsin and they should not be allowed to.

The soil survey of these seven townships in Oneida and Vilas counties proves that they should be permanently held within the forest reserve area. The forest rangers and their families will use a considerable portion of the areas that are possible agricultural land, but the state should not encourage any settlers to locate in this region.

URGENT NECESSITY FOR COMPLETING THE SOIL SURVEY.

The best available estimates show that there is approximately 13,000,000 acres of unimproved land in the twenty-two northern counties. Most of this land has a good soil, is free from rocks and is well adapted to farming, so that eventually probably 10,000,000 acres will be used in some form of agriculture, leaving some 3,000,000 acres for forest growth.

It should be understood that these figures are mere estimates, based upon the best available figures, but they are probably approximately correct in the proportion of agricultural to non-agricultural land and give some idea of the situation.

It need not be feared that the State Board of Forestry will try to class agricultural as forest land, for it is one of the main tenets of forestry that timber should not be held upon land suited to agriculture, as there is enough land in every country which is suited only to forest growth. However, although foresters receive some training in soil analysis, they are not experts and should not attempt to finally classify lands, where the question is a close one to decide, as it is in so many sections of northern Wisconsin.

The legislature of 1909 appropriated $10,000 a year, for two years, for a soil survey and the government put in an equal amount, so that $20,000 a year has been available for this work in 1909 and 1910. The work is being done under the direction of the College of Agriculture of the University and the State Geological Survey, and the field force examines each forty of land and maps the exact character of the soil.

During the summer, at the request of the State Board of Forestry, one field party was sent to examine some typical townships in Oneida and Vilas counties, within the forest reserve area, and the results of their work will be found in the preceding chapter.

In some townships, out of the total of 23,040 acres, perhaps from 1800 to 2000 acres would be found that was classed as poor agricultural land. It was just over the border line from being

classed as true forest soil and the question arose as to whether the state should sell say 2000 acres to settlers when the balance of 21,000 acres in the township should be permanently held under forests. The answer should be unquestionably No, for if settlers were encouraged or allowed to locate on such a small tract surrounded by lands to be held under forests, they would soon feel the lack of schools for their children and of the comforts and society of a well settled community.

When the government created the first forest reserves in the West, the few settlers living in these reserves complained that they were cut off from neighbors, good schools, etc., and Congress, feeling that their complaint was a just one, passed a law allowing any settler within a forest reserve to relinquish his claim to the government and select an equal acreage of government land anywhere outside of a reserve. This is merely mentioned to show that the government soon found that homesteaders were not content to live on isolated tracts and thus to be deprived of many of the benefits and advantages of communities, and if Wisconsin should allow settlers to locate on small and remote tracts within the forest reserve area, it would be doing a great injustice to the settler and storing up trouble for the state.

It will readily be seen therefore that it is very important to secure an accurate and complete soil survey of the proposed permanent forest reserve area, just as soon as possible, so that it can be definitely known just which townships should be included within the reserves and which excluded. Fortunately very few settlers are located in this area and not one acre of state land should be sold until the survey is completed.

The immediate need of a survey as far as the forestry work is concerned is in the forest reserves, but as has been stated, lumber and land companies and individual owners will not protect the young growth upon their lands until they know whether it is suitable for agriculture. Once they are certain it is valuable only for the growth of trees, they will either protect it themselves or sell it to some company or individual that will. It would seem that all roads lead to a soil survey, for in many parts of the state the protection of the forests is neglected on account of the feeling that possibly all of the land is valuable for farms, and while this doubt blocks forestry progress, the fires continue to destroy our forest wealth. The legislature should make generous appropriations for the soil survey, for every year's delay in its completion means a heavy loss.

THE FOREST PRODUCTS LABORATORY AND ITS WORK.

The great conservation movement, in so far as it relates to forestry, has been attacked by some who claim that we of the present generation are spending too much of our own money and emphasize too strongly the welfare of future generations, and are neglecting the problems of today which each and every one of us must face.

This criticism has been due largely to a common belief that forestry consists solely in growing trees, and that we are spending large amounts of money in reforesting areas which will not produce trees of any practical value for many years. There is, however, a very practical and important way in which future generations can be taken care of, and at the same time we can benefit ourselves. This consists in our utilizing to better advantage the timber that we now have. Anyone who is at all familiar with lumbering operations knows the enormous waste with which they are conducted. Experts have figured that this amounts to about 50 per cent. In other words, we waste about 50 per cent of what we grow. Most of our large sawmills have huge burners in which they burn up a large amount of wood for which at present no means of utilization is known.

In order to demonstrate the utilization of mill waste and show how allied matters can be more efficiently handled, the United States Forest Service has organied a branch of forestry the activities of which consist solely in working on the problems of today. Last June this branch of the Forest Service dedicated the Forest Products Laboratory at Madison, Wisconsin, which laboratory is the largest of its kind in the world. The building is owned by the University of Wisconsin, and the university is also supplying the laboratory with the necessary heat and power in order to run the various machines. The Forest Service on its part maintains a corps of workers comprising about sixty people, and furnishes all the apparatus and material necessary for the various tests. The machinery already installed has cost over

$50,000, and is the best obtainable. In addition, the Forest experts give a course of lectures to the students of the university, describing in detail the properties of various American woods, how they can be identified, and methods by which they are utilized. Although this course only began this fall about thirty-eight students are already enrolled.

As the field of work investigated by this laboratory is exceedingly broad, comprising as it does all phases of the manufacture of wood products, it has been necessary for reasons of efficiency and economy to divide it into seven groups called sections, and to place in charge of each a man who is thoroughly familiar with the work of that section. The investigations covered by these various sections can be considered briefly as follows:

Timber Tests.

This section investigates the strength of various woods and determines their mechanical properties, which facts are in such great demand by architects and engineers. It is now working on the strength values of many hardwoods which grow in Wisconsin. These were donated for testing purposes by the Northern Hemlock & Hardwood Manufacturers' association. As an illustration of the work of this section, the investigations on hickory might be cited. Manufacturers have always had a decided prejudice against what is known as red hickory, claiming that it could not be utilized in high grade work for spokes, pick handles, etc. This section undertook to determine what difference there is in the strength of red and white hickory and found that for all practical purposes it is negligible. As a result, instead of throwing away the red hickory as was done heretofore, manufacturers are beginning to use it in the manufacture of spokes and other commodities, thereby economizing greatly in our consumption of white hickory.

Considerable trouble has been experienced by certain lumber companies in that their boards have stained a bluish color while seasoning, this stain depreciating their value. It has been found that dipping the boards in soda solutions retards such staining, but some consumers have objected to using the soda-dipped lumber, claiming that it was not as strong as the untreated wood. Tests are now under way to determine whether or not this claim is founded upon fact.

These examples serve to illustrate the work being done by the section of timber tests.

Timber Physics.

Very little is known of how our American woods look under the microscope, and the section of timber physics is now preparing a complete set of photographs showing the microscopic structure of American woods. It is also collecting samples of all the important American timbers, which samples are being arranged in the form of an exhibit so that their various appearances can be easily determined.

A considerable loss in lumbering is due to the fact that we do not at present know how to dry certain kinds of wood without having them warp out of shape or check, and investigations are under way in the section of timber physics to find ways and means whereby certain of our American woods can be kiln dried to better advantage.

Distillation.

Quite an area in Wisconsin consists of stump land, and the section of distillation is finding out among other things, just how much turpentine can be extracted or distilled from such stumps, and also the quality of the product. If these stumps can be utilized to advantage, it will greatly assist the agricultural classes in clearing their stump land at a profit.

Investigations are also being conducted to show the quality and quantity of turpentine that can be obtained by chipping wood into different sizes and using different steam pressures.

Paper Tests.

The paper industry in Wisconsin has a very large amount of capital invested in it. All who are familiar with the state know that the supply of spruce has become practically exhausted and many of the large paper mills, employing a great number of people, are being forced to import spruce from other states. This naturally places them under a decided disadvantage when it comes to competing with other establishments more favorably located with regard to their supply of wood.

The pulp section is cooperating with the American Paper and Pulp association in trying to find how common woods that are at

present unused, such as jack pine, can be utilized in place of the more expensive and scarcer spruce wood. This work is of such great and immediate importance that a branch laboratory has been established at Wausau, Wis., the primary object of which is to determine the quality and quantity of pulp that can be made from inferior woods growing in the state, by what is known as the mechanical process. If inferior woods like jack pine can be used in the manufacture of paper, the greater permanency of Wisconsin's pulp mills will be assured.

In addition to the investigations into the manufacture of pulp by mechanical means, tests are also being made in the laboratory at Madison to determine the quality of paper made by what are known as the chemical processes which use soda and sulphite as a means of disintegrating the wood.

Chemistry.

Naturally there are a great many chemical problems connected with the work of an institution such as the Forest Products Laboratory, and in order to solve them an up-to-date chemical laboratory has been installed. This section analyzes the quality of various turpentines, determines the quantity and quality of tannin extracted from different barks and woods, and the properties of chemicals used in the treatment of wood products.

Preservation.

All are familiar with the way wood rots when exposed to the weather. The loss from this cause is enormous. For example, we use about 120 million cross ties every year in the United States. By giving them a proper treatment with chemicals it is possible to reduce our annual consumption of cross ties to 50 millions. The section of preservation therefore is attempting to find out the best means of prolonging the life of different kinds of wood. Experiments are under way to determine the possibility of utilizing cheap woods like hemlock in place of cypress in the construction of silos. Treated hemlock and pine are now undergoing tests in a silo belonging to the University of Wisconsin.

In addition, experiments are being made to determine what length of life can be obtained in fence posts cut from such timbers as jack pine, cottonwood, etc. Next year experimental street

pavements will be laid with blocks made of jack pine to determine their value for street paving purposes as compared with the more expensive woods such as longleaf pine.

The Chicago, Milwaukee & St. Paul railroad is aiding the laboratory in its determinations of the value of different woods not now used for cross ties, and ties made from jack pine are being treated and placed in the tracks of this company and records kept upon them. If it can be shown that these cheap and abundant woods, growing in Wisconsin, can be used to advantage when given a chemical treatment, it will greatly add to the permanency of a number of its present industries.

ENGINEERING.

As much of the equipment used in the investigations described above, is of original design and manufacture, a section of engineering has been created to do this work. This section is working upon designs for different types of wood preserving plants, and of apparatus for distilling turpentine, etc., the object being to make just as practical as possible the various discoveries that are brought out from time to time.

* * *

This sketch reveals, in brief, how the Forest Products Laboratory is working on problems that are bound to be of considerable practical importance to the Commonwealth of Wisconsin; but in addition, it is carrying on a large number of investigations that affect the United States as a whole. Any American citizen has a right to ask this laboratory for technical information relating to its work, and this information is given without any charge whatever. Moreover, the laboratory is always open for inspection, and those interested will be afforded a good opportunity to examine into its work just as closely as they may desire.

THE INTIMATE RELATION OF FOREST COVER TO STREAM FLOW.

One of the most valuable of Wisconsin's resources is her water powers. As the state has no deposits of coal, the great source of energy for manufactures, for transportation, for light and heat is in the many water powers that are well distributed over the state. It is of the greatest importance to the industrial interests of Wisconsin that these water powers be developed and utilized to their highest capacity and protected by the construction of reservoirs and the maintenance of a forest cover on all watersheds.

A uniform stream flow is of the utmost importance to the proper utilization of water powers, as the usefulness of a power must be measured largely by its head at low water flow.

It has been a common experience in Wisconsin for many years past, following upon the large lumbering operations in the state, that the thaws of spring have brought on more or less heavy floods and an enormous volume of water has been discharged through our stream channels within a comparatively short period of time and beside the inordinate waste of power and loss of water, a great deal of damage was done by erosion of the banks. By summer the same streams are reduced to a mere trickle and even our largest rivers but thinly cover their erosion-widened channels, while great clogging shoals of sand appear above the surface of the water. The great problem is to save the damaging flood waters of spring to supplement the summer flow.

A great deal can be accomplished by the operation of artificial reservoirs but the maintenance of a forest cover upon the upper watersheds is necessary, even with artificial reservoirs; and with an adequate area under forest cover, artificial reservoirs might be dispensed with.

Many people do not understand just how forests affect the regimen of streams. A comparison of conditions in the forest and in the open will make this clearer. In the spring the snow in the open is melted rapidly by the sun and wasted rapidly by the winds, and although much of the moisture is dissipated by evap-

oration, water is formed very rapidly by the melting snow and flows off all slopes without hindrance because the frozen ground has a hard impermeable surface. Even in summer there may be similar conditions in the open. The rain will flow quickly over the sunbaked ground, rushing into whatever natural channels are available, not finding permeable soil.

In the forest on the contrary, and especially in the pine forest, the snow is sheltered from the sun's rays and protected from the sweep of drying winds. It melts very slowly and gradually. In the cedar swamps the Indians find snow or ice for their sick far into the summer season. The water formed by the melting snow does not flow off over the surface. It is held by the thick layer of leaves and twigs that forms the forest floor and sinks gradually into the soil underneath, which is not only very permeable but contains an intricate network of rootlets and roots along which the water finds its way downward deep into the earth, whence it reappears long afterward through underground streams and springs, forming the small streams that feed our rivers. The summer rains also reach the forest soil gradually through the dense mid-season foliage, which drips water for hours after a rain, and are received into the soil, which yields them up gradually to the stream channels, as they are needed. In the open, the rains flow off rapidly over the ground surface and hard rains on bare ground beat the soil and wash it away, forming little gullies and then larger ones, and clogging the stream channels with detritus. The difference in the same soil in the open and under forest cover can be seen by examining an unsheltered road through a forest and the soil on either side. After a rain the road will be muddy but no matter how saturated the forest soil, it will be porous and grainy and one can walk over it without getting his shoes muddy.

Wisconsin has no mountains and therefore has no need to guard against sudden mountain torrents, with the accompanying loss of surface soil and the burying of fertile valleys under sand and gravel; but the configuration of the state is sufficiently varied to conduce to the production of floods and very serious ones, and the creation of innumerable reservoirs alone could never prevent certain serious evils. Much water might be stored and saved, but reservoirs could never prevent the sudden melting of snow on frozen ground, nor the washing away of soil and the clogging of both stream channels and reservoirs with sand and detritus.

The water that issues from forested watersheds and that flows

in forest streams, is remarkably clear. The forest soil is not only porous but it is bound together by the roots of trees and undergrowth and the water filters through it instead of beating upon it and carrying portions of it away. Of course the erosive power of water, charged with sand and gravel, is very much greater than that of clear water. The Mississippi river is a tragic example of the evils of deforestation and the United States government has recognized the source of the evil in granting to the forestry departments of both Minnesota and Wisconsin a tract of 20,000 acres, so as to bring the upper headwaters of the river under forest cover. No amount of dredging will make a permanent deep water channel. The planting of trees has held the banks intact on limited areas but with the varying flow, sands are continually shifting, channels widening and the level of the stream bed rising, while tons of soil are continually carried out through the mouth of the river.

Our water power resources are not only incalculably benefited by a uniform stream flow, but they become of little value with a widely fluctuating flow and all its accompanying evils, and although the operation of reservoirs will mitigate the evils, it will not cure them. The almost immediate and always disastrous effect upon stream flow when forests upon the headwaters of rivers are destroyed has long been recognized in all parts of the world where forestry is practised, but as this beneficial effect of the forest has been denied by certain interests in Wisconsin, the following authorities are quoted and a few examples of the many which might be given.

THEORY.

The theory of the relation of forest cover to stream flow and soil stability is as follows:

Gifford Pinchot says: "Both wide experience and scientific investigation have shown that there are two functions exercised by the forest in relation to stream flow.

"1. Its tendency to reduce the difference between high and low water, an influence which is of the utmost importance in the distribution of flood crests, and in maintaining a steady flow of water during the different seasons of the year and during cycles of dry and wet years.

"2. Its value as a surface protection against soil erosion, thus reducing the solid burden of storm waters, and decreasing the

deposits of sand and silt, which are the causes of shallow and changing channels.

"These two functions follow from the very nature of the forest as a soil cover. The roots of trees penetrate through the soil to the underlying rock, where they fix themselves in the crevices, and in this way hold in place the loose soil and prevent slipping and washing. The crowns of the trees break the force of the rain and also protect the soil from being carried away to the lower valleys during heavy storms. The leaves and the branches allow the rain to reach the ground but gradually; after a rain, water continues to drip from the crown for several hours, and the soil is thus enabled to absorb the greater part of it. Screened from the rays of the sun and covered with a surface mulch of fallen leaves and humus, the soil remains loose and granular in structure and is therefore capable of imbibing and retaining water with sponge like capacity. It is strewn with fallen leaves, branches and trunks, and traversed by a network of dead and live roots which impede the superficial run-off of water after heavy storms. This retardation of the superficial run-off allows more of it to sink into the ground through the many channels left in the soil by decayed roots. Surface run-off of rain water is wasteful and destructive, and unless artificially controlled serves as a rule no useful purpose and may inflict great loss. Sub-surface drainage makes the best use of the total precipitation that reaches the ground. It serves both for the sustenance of plant life and for the flow of streams. Accordingly the agency of the forest cover in increasing the seepage run-off at the expense of the surface run-off is the most important function which the forest performs in relation to the water supply.

"A common conception of the effect of forest destruction upon climate is that it reduces the amount of rainfall. Because springs become dry and streams shrink in a deforested region, it is assumed that less rain must fall. Whether or not there be any truth in this assumption (I believe there is), it is certain that the main cause of the observed facts is the profound effect which forest destruction has upon the course which the water takes after it reaches the ground. The greatest influence of the forest is not upon the amount of rain that falls, but on what becomes of the rain after it falls. The water that sinks into the ground passes for greatly varying distances beneath the surface before reappearing, and is thus drawn off gradually from the forested water-

shed and supplies the brooks with pure water relatively free from detritus."

B. E. Fernow in "Economics of Forestry" says:

"The philosophy of the influence on waterflow rests mainly upon the recognition that the rain and snow waters penetrate more readily a forest-covered soil than one that is bared of this protective cover. The action here is of a threefold nature; first, the mechanical obstruction which the foliage offers, reduces the amount of the water which reaches the soil and lengthens the time during which it can do so; the foliage, together with the loose litter of the forest floor, also reduces the compacting effect of the raindrops and the drying effect of sun and wind, and keeps the soil granular, so that the water can easily percolate, then the mechanical obstruction which the litter, underbrush, and trunks, and possibly here and there moss, offer to the rapid surface drainage of waters, lengthens the time during which this percolation may take place; and thirdly, the network of deeply penetrating roots, live and decayed, offers additional channels for a change of surface drainage into sub-drainage..... Particular interest in this connection attaches to the influence of forest cover on the melting of snow masses, which gives rise to spring floods. In the dense forest, the snow is usually less deep, a part being intercepted by the crowns of trees and evaporated, and lies more uniformly, owing to the absence of drifting winds. It is a well-noted experience that it will lie in the shade of the woods from one to two weeks longer, i. e. melt so much more slowly. These elements of distribution in space and time must have an influence upon the rapidity of surface flow, and if the soil is not frozen, time is given for percolation and gradual removal..... This forest effect on the run-off of terrestrial waters is naturally greatest and most important in mountainous regions, where the water has the tendency to collect quickly and to be carried off rapidly, but it also exists in the level plain, where it has the tendency to elevate the general ground-water level and thereby make a reserve available during times of drouth."

EXAMPLES.

The few following examples are given as showing the effect of forest cover on stream flow:

"Mr. W. B. Greeley of the U. S. Forest Service made a careful investigation of two streams in the Catskills. One, Esopus

creek, was well-timbered, having not more than 15 per cent of cleared land upon its basin. The Wallkill had 85 per cent of cleared land and the remaining forest cover was confined to small scattered woodlots, but its topography was such that there could be water storage by natural reservoirs. The differences in the two streams were as follows:—

"1. The slopes of the Esopus basins are twice as steep as those of the Wallkill.

"2. The fall of the Esopus is six times as rapid as that of the Wallkill.

"3. The topography of the Esopus basin is much more simple and direct than that of the Wallkill.

"4. The Esopus has no natural reservoirs, whereas a relatively large percentage of the Wallkill basin consists of swamps and ponds.

"The question was whether forest cover on the one hand or moderate topography, extensive natural reservoirs, and favorable geological conditions on the other, exert the greater relative influence in storing precipitation and equalizing stream discharge.

"It was found that the combined influence of the moderate topography, natural reservoirs, and favorable geological conditions of the Wallkill is somewhat stronger in promoting evenness of stream flow than the compact forest cover of the Esopus basin.

"At the same time the margin of difference between the regularity of the two streams is so small as to establish beyond doubt that the forest cover of the Esopus does exert a strong conserving and regulating influence upon the flow of that stream. This is especially true when we recall how unfavorable the other factors of topography and geology upon that catchment area are to equable stream flow. The forest cover of the Esopus thus appears to overcome to a large degree the unfavorable effects of steep topography, hard and dense surface rocks, and marked deficiency in natural storage facilities. It reduces the flow of that mountain stream to a regularity almost equal to that of a lowland type of stream where exactly opposite topography conditions prevail."

Mr. C. C. Vermeule in the report of the State Geologist for New Jersey for 1895 says:

"It is a matter of common observation that at such times rivers continue to flow when rainfall is very much less than the evap-

oration, and indeed, for long periods when there is no rainfall at all. Any thing which tends to increase this amount of water held in the ground, and to regulate its discharge into the streams, tends to give a larger flow, and to shorten the periods of very low water in the streams during droughts, and with this increased capacity of the ground to absorb rain comes also less frequent floods. The more water that is drained out from the soil the more can be absorbed when the heavy rains come at the end of the droughts. Humus in the forest forms a great sponge, and of itself holds a large amount of water, while it and the inequalities caused by tree roots, etc., tend to prevent the water flowing over the surface and the roots of the trees provide channels by which the water percolates into the sub-soil readily. In this way the forest will easily absorb a larger amount of water than open lands. A high state of cultivation also has a tendency to increase the capacity of the ground to absorb water because of constant loosening of the surface and the facilities provided for ready drainage. In this way cultivation, like forests, tends to render floods less frequent, but the effect of the drainage of the soil is that the ground water absorbed is fed out more rapidly to the streams during the early months of a dry period than is the case in forests; consequently, the ground water is sooner exhausted, and the duration of the low stages of the rivers during protracted droughts is thereby lengthened. Barren water-sheds offer much less capacity for absorption of rainfall. There is no humus or other matter on the surface to retain the rain, and the ground becomes hard and resists free percolation. The difference between forested and deforested water-sheds is very well illustrated by the Passaic and the Raritan respectively, while some of our small red sandstone water-sheds are good types of barren country.

"We have, in the following table, contrasted these types, the data being obtained from the Report on Water-Supply. This table shows in inches of rainfall the amount of water which would flow off to the several streams from their water-sheds for each month, during a drought of such a character that all conditions from rainfall, or depletions from evaporation, to the ground water are suspended, the water here shown being entirely water of drainage.

YIELD OF SPRINGS ON VARIOUS TYPES OF WATER-SHEDS DURING DROUGHT, IN INCHES OF RAINFALL.

Month.	Passaic Type of forest water-shed.	Raritan Type of highly-cultivated water-shed.	Type of barren water-shed.
First	1.16	1.43	.94
Second	.54	.64	.38
Third	.40	.45	.26
Fourth	.33	.35	.20
Fifth	.32	.30	.14
Sixth	.31	.27	.12
Seventh	.30	.25	.10
Eighth	.29	.23	.08
Ninth	.28	.22	.07
Total	3.93	4.14	2.29

"It will be observed that while the Raritan and the Passaic show nearly the same total amount of drainage, the Raritan gives up this water faster in the early months, and therefore its springs become sooner exhausted and it runs lower toward the last of the drought. The barren ground, having absorbed much less water, has less flow from springs throughout. How important this is upon the dry-season flow of these streams becomes apparent from the following table:

FLOW IN GALLONS DAILY PER SQUARE MILE DURING THE LAST EIGHT MONTHS OF THE DRIEST YEAR (1881).

	Passaic. Forested.	Raritan. Cultivated.	Barren water-sheds.
April	597,000	754,000	631,000
May	297,000	315,000	145,000
June	272,000	272,000	139,000
July	207,000	124,000	22,000
August	140,000	89,000	22,000
September	139,000	87,000	23,000
October	129,000	84,000	22,000
November	127,000	93,000	23,000

"The conditions here shown are believed to be illustrative of the effect of forests upon stream flow, and the comparative effects of cultivation and barrenness. We have found it a rule that the heavier forested catchments furnish a steadier flow, better sustained during dry periods, and that while they are subject once in a great while to severe floods, nevertheless floods not quite so severe are less frequent than upon deforested catch-

ments not highly cultivated. Flood-flow, it must be remembered, however, is largely a matter of topography, and while floods are heavy and frequent upon the deforested Raritan and Neshaminy, the same is true of the well-forested Ramapo and Pequannock, while they are extremely light upon the lightly-wooded Pequest. The economic importance of the effect we have noted lies in the greater value of forested streams for water power, and the smaller storage reservoirs needed thereon to furnish a given daily supply of water to cities. Illustrative of this, the Passaic will furnish for 9 months of the year from 100 square miles of watershed, 45-horse power on 10 feet fall, whereas the Raritan will furnish but 41 and the barren water-shed 28-horse power. During the other three months the Passaic will furnish an average of 36, the Raritan 32 and the barren water-shed 20-horse power. To collect 570,000 gallons per square mile of water-shed, we shall need storage reservoirs of the following capacity: Passaic, 84,000,000, Raritan, 110,000,000, and barren water-shed, 126,000,000 gallons. The difference in cost of collecting a supply at the above rate per square mile, therefore, upon the type of streams selected to represent the forested and those representing the barren conditions, would be about $8,400 per square mile. Both the Passaic and Raritan exceed 800 square miles in catchment. For this area the saving would be $6,720,000.

"Taking the same area, we find the excess of water power of the forested stream would be for 100 feet fall, 1,360-horse power, the value of which, at a rental of $35 per horse power per annum, would be $47,600 or the interest at 5 per cent on $952,000.

"We do not advance these figures as exact measures of the value of forests, but they may be taken as indicative of the possible financial loss which might result in stream flow alone from deforesting such of our water-sheds as are not adapted for cultivation.

"It will also be seen how amply this effect of forests in increasing the stream-flow for 5 or 6 months during the latter part of a dry period justifies popular opinion as to a falling off of streams when the forests are cut off. Such effect is very much more likely to impress itself upon the popular mind than increase of evaporation, for this would tend to decrease the total run-off for the year without being very apparent to ordinary observation. Being a much more enduring effect, it would also be more noticeable than any change in the very greatest or least rate of discharge.

"Most of the portion of the state now in forest is not adapted to cultivation. It should remain in forest, because it will in no other way yield revenue; because it is needed to maintain the equable flow of our streams, and because it renders beautiful what would otherwise be an unsightly waste. Unless the state is prepared to assume the ownership of forest lands, the continued good condition of the forests can only be secured by instructing the owners how they can improve this condition, and, at the same time, increase their revenues. It is especially important that our Highlands forests, for the future gathering-grounds for our city water supply, shall continue to be preserved and improved, as they undoubtedly have improved during the last quarter century."

Statements of Authorities.

Says Mr. Charles A. Stone, of the firm of Stone & Webster, Electrical Engineers, Boston, Mass.:

"One of the most important features in the commercial development of a waterpower enterprise is the uniformity of flow of the stream on which the development is undertaken. Where streams are subject to severe droughts or great floods, commercial development is practically impossible. Nature has provided for the uniformity of flow by covering the water-sheds at the headwaters of these streams with forests..... When these forests are cut off, conditions are entirely changed, and great freshets result."

Mr. Theophilus Parsons, a representative of the manufacturing interests of New England, says:

"New England is largely dependent upon her factories run by water-power. The flow of the rivers furnishing this power is growing yearly more uncertain. Both floods and droughts are more frequent. It is plenty or famine. This situation is due to the pernicious cutting of woods along the headwaters of the New England rivers.

"I have known the Connecticut for over thirty-six years. It drains an area of four thousand square miles. Until recently the wooded hills kept the flow of the river even. Now, in the spring, we have floods, while in the summer the water sometimes will not run our mills.

"This is a question in which every manufacturer on the eastern coast of the United States is interested."

In "Forest Influences" Mr. B. C. Fernow says, "Snow will lie

in the forest more evenly and continuously than on the open, wind-swept areas. Thereby not only the amount finally remaining for drainage is increased, but the soil is prevented from freezing, and is kept open for percolation when the snow melts. The retardation of the melting has been determined by Bühler in Switzerland to be from eight to fourteen days."

Honorable Robert M. LaFollette said in his message as Governor of Wisconsin in 1905:

"Probably not more than half a dozen states in the Union, are so abundantly supplied with natural waterpower as Wisconsin, and no state in the middle west is comparable to it in this respect. More than one thousand lakes, widely distributed within its borders, form natural reservoirs, furnishing sources of supply to the streams which flow through every section of the state.

"We have recently undertaken, at considerable expense, the establishment of a forestry commission with a view of preserving whatever remains of the forests upon state lands not suited to agriculture, and the reforesting of these, and such other lands as can most profitably be used for that purpose. The state forestry legislation, adopted two years ago, very defective in many respects, will, it is hoped, be so amended as to establish this important work upon a permanent and efficient basis. It is referred to in this connection because the preservation of our forests and the reforesting of lands about the sources and along the headwaters of our principal streams, are absolutely essential to the preservation of Wisconsin's splendid waterpowers. The restoration of our forests, and the preservation of our waterpowers go hand in hand."

Governor James O. Davidson in his message in 1909, said: "Our forest reserve now comprises 300,000 acres of land, situated in seventeen counties of the state. During the past two years the state has purchased, through the department [of forestry] about 34,000 acres of cut-over lands, as an addition to the reserves in Iron, Vilas and Oneida counties, and has entered into a contract to purchase 14,000 more acres in Vilas county. These lands will, in time, be of great value to the state in timber produce, but their greatest value is in protecting the water powers thereon. The lands preserved by the state are not of value for agricultural purposes and have been purchased at a small outlay. The acquiring of other lands for forestry purposes, especially on or near the headwaters of our streams, should be encouraged."

The Governors of all the states, at the White House conference in May, 1908, adopted the following declaration of principles:

"We urge the continuation and extension of forest policies adapted to secure the husbanding and renewal of our diminishing timber supply, the prevention of soil erosion, the protection of headwaters, and the maintenance of the purity and navigability of our streams. We recognize that the private ownership of forest lands entails responsibilities in the interests of all the people and we favor the enactment of laws looking to the protection and replacement of privately owned forests.

We recognize in our waters a most valuable asset of the people of the United States, and we recommend the enactment of laws looking to the conservation of water resources for irrigation, water supply, power and navigation, to the end that navigable and source streams may be brought under complete control and fully utilized for every purpose. We especially urge on the Federal Congress the immediate adoption of a wise, active and thorough waterway policy, providing for the prompt improvement of our streams and the conservation of their watersheds required for the uses of commerce and the protection of the interests of our people."

The letter of President Roosevelt transmitting to Congress the report of the National Conservation commission contained the following passage: "I especially commend to the Congress the facts presented by the commission as to the relation between forests and stream flow in its bearing upon the importance of the forests lands in national ownership. Without an understanding of this intimate relation the conservation of both these natural resources must largely fail."

The North American Conservation conference representing Canada, Mexico and the United States made a declaration of principles, which contained the following:

"We recognize the forests as indispensable to civilization and public welfare. They furnish material for construction and manufacture, and promote the habitability of the earth. We regard the wise use, effective protection, especially from fire, and prompt renewal of the forests on lands best adapted to such use, as a public necessity and hence a public duty devolving upon all forest owners alike, whether public, corporate or individual.

"Forests are necessary to protect the sources of streams, mod-

erate floods and equalize the flow of waters, temper the climate and protect the soil; and we agree that all forests necessary for these purposes should be amply safeguarded. We affirm the absolute need of holding for forests, or reforesting all lands supplying the headwaters of streams, and we therefore favor the control or acquisition of such lands for the public."

It is estimated that Wisconsin is blessed with approximately 1,000,000 horse power in hundreds of water powers widely distributed over the state. Such a wealth of water powers which in a few years will all be harnessed and made to convey energy to nearly every city and town, means everything to the future of the state, provided that reasonable, common sense methods of stream conservation, which have been tried and long since proven in old countries, are adopted. The value of our streams for water power development will rest almost entirely upon the evenness and uniformity of their flow. Wisconsin is remarkably fortunate in having such a network of lakes and swamps at the headwaters of her important rivers, as these catch and hold the spring freshets and their capacity can be greatly enlarged by building dams. The lands draining into these lakes at the headwaters of the rivers should be included within the forest reserves and the forest growth protected.

Fortunately most of these lands are not as valuable for agricultural crops as for timber, and therefore it will not be necessary to keep forests on lands which should be made into farms.

THE PRINCIPLES OF FORESTRY SHOULD BE TAUGHT IN THE SCHOOLS.

The preservation of the forest resources of this country is such a great economic problem and one that must be solved so largely through educational channels so that all our people shall clearly understand what constitutes proper forest management, that it would seem that the time has arrived when the fundamental principles of forestry should be taught in the public schools. Such instruction is especially important in the forest portions of the state as so many of the pupils will be engaged in some branch of the wood using industry or will locate upon the farm where the proper management of the woodlot is of considerable importance.

The enormous and unnecesary losses from forest fires should be especially emphasized, for Americans as a rule are criminally careless in the use of fires in the forests, but much of such carelessness comes from ignorance and not stopping to think of the consequences, and the best time to drive home the lesson is when the man is a boy. Such instruction if properly given is not dry but can be made a real live interest to every boy and girl. Mr. Hugo A. Winkenwerder, author of Circular No. 130 of the Forest Service on "Forestry in the Public Schools," says in his introduction:

"It is not the object of this circular to advocate the addition of another study to the public school curriculum. In many cases it is already too cumbersome. But with the changes in our economic, political, and social conditions, and with the progress made in the sciences, it is necessary to adapt our present courses to the new conditions. Teachers often feel that their lot is a hard one because they are required to buy new books and to attend lectures and summer schools in order that they may keep up with the continual changes. Though the teacher's salary is often incommensurate with the things required, it is very evident that teachers must keep alive to the new conditions to be of real service.

"The progres of forestry and the forest movement in this coun-

try must be numbered among these changes. Teachers are now interested in the subject of forestry, and a point has been reached where it deserves attention in public school teaching. The text-books which should give a place to it are generally far behind the movement and revisions should remedy this as new editions come out. There is now but little reason for the appearance of geographies, botanies, and certain other texts without a just share of the space devoted to forestry. On the other hand the energetic teacher will not wait for a new text, but will secure the necessary information and present it to the classes.

"Forestry should not be taught in the public schools as a separate study, nor should it take up technical details of the actual practice of forestry except to a limited extent in agricultural high schools. Where, then, does it belong? The answer to this question should be sought in the ultimate object of all public school instruction. It is sometimes forgotten that the business of teaching is not the mere presentation of facts, but to train the mind and body in such a manner that the child can cope successfully with the problems, private and public, which later confront him in his daily life as a citizen. Teachers cannot accomplish this end unless they correlate the work of the school with the things going on in the world outside.

"The child should be made to take an active interest in the important problems before Americans as a people, and be set to thinking about these problems in connection with his school work If a teacher of history does not interest his pupils in the coming elections and cause them to apply their past instruction to the questions which should decide the vote, he fails to correlate the life of the school with that of the world. Likewise, if a teacher of geography, in discussing river and harbor improvements, does not create an active interest in any local improvements that may be under way, an opporunity is missed. Thus forestry should be taught as an integral part of related subjects. The work of the school should treat forestry as one of the important economic and public questions in the life of the world.

"Teachers are aware that there are now before the people many problems which are interwoven with forestry, and that our citizens are seeking information to enable them to act wisely when these problems confront them.

"It is unfortunate that little is now taught in the public schools which the teacher can use as a foundation for inculcating right

views concerning these problems. For example, suppose the teacher lives in a little town on the Ohio River—a town that is being menaced by ever-increasing floods. The teacher of geography may tell pupils that these floods are due to the removal of the forests from the Appalachian Mountains, and that, as the forests are further removed, the floods will become worse and worse; but the pupils have possibly not been taught anything about the influence of forests upon stream flow and so do not really understand the situation. They are told a bare external fact and that is the end of it.

"But suppose they have been taught in their nature-study work to observe what becomes of rain water and snow water, how exposed soil is washed and gullied, and whither the muddy little torrents transport their burden; how various kinds of vegetation modify these effects; how gently the rain falls and how slowly the snow melts in the woods, and how absorptive is the forest soil—in other words, the every-day facts of erosion as they may be seen in every child's dooryard. Can it be doubted that the lesson of the flood as related to forest destruction would come home in terms of living experience."

Those who are interested in this matter are referred to the above circular which explains just how forestry can be taught in connection with other courses and also gives a list of reference pamphlets and reports, most of which can be secured from the Forest Service, Washington, D. C., free of cost.

FOREST RESERVES AS INVESTMENTS.

As explained in this report the state should acquire a forest reserve of approximately 2,000,000 acres in the wonderful lake region of northern Wisconsin, in order to protect the headwaters of our most important rivers, supply a portion of the timber that will be needed to retain our wood-using industries within the state, and to preserve this beautiful lake country as a great summer resort for all the citizens of Wisconsin and of other states as well. The state will gain materially by securing the above results.

Protecting the headwaters of our rivers will mean that the stream flow will be more uniform, therefore more horse power will be developed in the water powers and bigger mills with a larger output will be the result.

In time the timber that can be produced on 2,000,000 acres of land under forestry management will be a big factor in supplying the wood-using industries with their raw material, and thereby saving these industries to the state.

Our northern lake region, when it is included in a big forest reserve and protected, will bring tourists, campers, fishermen and hunters from all over the country and they will annually spend millions in the state, and largely in the northern portion where it is most needed.

Thus it will be seen that the people of the whole state will indirectly gain very greatly by the proposed forest reserves, but what of the direct returns, or in other words, what revenue can the state hope to receive in time from the reserves, for it should always be remembered that the purchase of a forest reserve is an investment, that forestry is a business and not a fad, and that it must show a reasonable return upon the capital invested.

If Wisconsin had been as wise as Minnesota and retained its timber lands instead of selling them, the forester would have a going concern and the timber would be his stock, which he would sell as it became mature, and thus be able to show a revenue at once. But Wisconsin chose in the past to sell its timber lands to

anyone and everyone, at a fraction of what their present value would be, and therefore the state must buy back the timber lands that it sold, only now thousands of acres have been cut over and burned and hence it will be many years before there will be much merchantable timber to sell. However, the bright side is that much of the timber that was left is now, with increasing demands, becoming valuable. It is very difficult to foretell what timber will be worth twenty-five or fifty years from today, but it is, at least, safe to say that it will be much higher.

Taking into consideration the acreage of land within the forest reserves that is now fairly well timbered, and the acreage of cut-over land that contains only a small amount of timber and also the land that must be planted, it is not probable that in twenty-five years the state would receive a net revenue of over $1.00 per acre, but at the end of fifty years, this should have risen to at least $2.00 per acre. It should be explained that the revenue from firewood and all other forest products is included in this estimate, also the revenues from leasing camp and cottage sites, which will be very considerable. If then the state acquires by purchase a forest reserve of 2,000,000 acres or 1,660,000 acres in addition to the 340,000 acres it now owns, it should be able to count on a net annual revenue of $2,000,000 after twenty-five years and of $4,000,000 after fifty years.

In this connection the following facts in regard to "What Forestry Has Done," taken from circular No. 140 of the Forest Service by Treadwell Cleveland, Jr., will be of interest:

Many people in this country think that forestry had never been tried until the Government began to practice it upon the National Forests. Yet forestry is practiced by every civilized country in the world, except China and Turkey. It gets results which can be got in no other way, and which are necessary to the general welfare. Forestry is not a new thing. It was discussed two thousand years ago, and it has been studied and applied with increasing thoroughness ever since.

The principles of forestry are everywhere the same. They rest on natural laws, which are at work everywhere and all the time. It is simply a question of how best to apply these laws to fit local needs and conditions. No matter how widely countries may differ in size, climate, population, industry, or government, provided only they have forests, all of them must come to forestry some time as a matter of necessity.

The more advanced and progressive countries arrive first and go farthest in forestry, as they do in other things. Indeed, we might almost take forestry as a yardstick with which to measure the height of a civilization. On the one hand, the nations which follow forestry most widely and systematically would be found to be the most enlightened nations. On the other hand, when we applied our yardstick to such countries as are without foresty, we could say with a good deal of assurance, by this test alone, "Here is a backward nation."

A singular and suggestive exception is England, which, though provided with mountain and heath lands capable of producing a large part of the wood for home consumption, has, with strange indifference, been leading all nations in volume of wood imports and depending mainly upon foreign sources for her supplies. England has hitherto been able to count with certainty upon outside aid from such near neighbors as Norway and Sweden. This policy has seemed satisfactory to the people in spite of the examples of a more provident policy afforded by rival nations almost at her door. The geographical and economic positions of the country have permitted the government, for the time at least to ignore measures found necessary for the public welfare in other countries of the same rank.

The countries of Europe and Asia, taken together, have passed through all the stages of forest history and applied all the known principles of forestry. They are rich in forest experience. The lessons of forestry were brought home to them by hard knocks. Their forest systems were built up gradually as the result of hardship. They did not first spin fine theories and then apply those theories by main force. On the contrary, they began by facing disagreeable facts. Every step of the way toward wise forest use, the world over, has been made at the sharp spur of want, suffering, or loss. As a result, the science of forestry is one of the most practical and most directly useful of all the sciences. It is a serious work, undertaken as a measure of relief, and continued as a safeguard against future calamity.

Roughly, those countries which to-day manage their forests on sound principles have passed through four stages of forest experience. At first the forests were so abundant as to be in the way, and so they were either neglected or destroyed. Next, as settlements grew and the borders of the forest receded farther and farther from the places where wood was needed and used, the

question of local wood supplies had to be faced, and the forest was spared or even protected. Third, the increasing need of wood, together with better knowledge of the forest and its growth, led to the recognition of the forest as a crop, like agricultural crops, which must be harvested and which should therefore be made to grow again. In this stage silviculture, or the management of the forest so as to encourage its continued best growth, was born. Finally, as natural and industrial progress led to measures for the general welfare, including a wiser and less wasteful use of natural resources, the forest was safeguarded and controlled so as to yield a constant maximum product year after year and from one generation to another. Systematic forestry, therefore, applied by the nation for the benefit of the people and practiced increasingly by farsighted private citizens, comes when the last lesson in the school of forest experience is mastered.

The United States, then, in attacking the problem of how best to use its great forest resources, is not in the position of a pioneer in the field. It has the experience of all other countries to go upon. There is no need for years of experiment with untried theories. The forest principles which hundreds of years of actual practice have proved right are at its command. The only question is, how should these be modified or extended to best meet American conditions. In the management of the National Forests the Government is not working in the dark. Nor is it slavishly copying European countries. It is putting into practice, in America, and for Americans, principles tried and found correct, which will insure to all the people alike the fullest and best use of all forest resources.

In the following short history of what forestry has done in other countries, it will be possible to give only the chief facts. Yet even in this incomplete review two things stand out with striking clearness. One is that those countries which have gone farthest in the practice of forestry are the ones which to-day are most prosperous, which have the least proportion of waste land, and which have the most promising futures. The other is that those countries which spend most upon their forests receive from them the greatest net returns.

GERMANY.

The German Empire has nearly 35,000,000 acres of forest, of which 31.9 per cent belongs to the State, 1.8 per cent to the Crown, 16.1 per cent to communities, 46.5 per cent to private persons, 1.6 per cent to corporations, and the remaineder to institutions and associations. There is a little over three-fifths of an acre of forest for each citizen, and though 53 cubic feet of wood to the acre is produced in a year, wood imports have increasingly exceeded wood exports for over forty years, and 300,000,000 cubic feet, valued at $80,000,000, or over one-sixth of the home consumption is now imported each year. Germany's drains on foreign countries are in the following order: Austria-Hungary, 19,750,000 tons; Russia and Finland, 18,000,000 tons; Sweden, 508,000 tons; the United States, 360,000 tons; Norway, 49,000 tons.[1]

German forestry is remarkable in three ways. It has always led in scientific thoroughness, and now it is working out results with an exactness almost equal to that of the laboratory; it has applied this scientific knowledge with the greatest technical success; and it has solved the problem of securing through a long series of years an increasing forest output and increasing profits at the same time.

Like other advanced European countries, Germany felt the pinch of wood shortage a hundred and fifty years ago, and though this shortage was relieved by the coming of the railroads, which opened up new forests, and by the use of coal, which substituted a new fuel for wood, the warning was heeded, and systematic State forestry was begun. After all, the scare was not a false one, for even to-day Germany is not independent as regards wood, since she has to import one-sixth of all she uses.

In addition to the wood-supply question,Germany was forced to undertake forestry by the need of protecting agriculture and stream flow. The troubles which France was having with her mountain torrents opened the eyes of the Germans to the dangers from floods in their own land. As a result the maintenance of protective forests was provided for by Bavaria in 1852, by Prussia in 1875, and by Württemberg in 1879.

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[1] According to the kind of wood, a ton is equivalent to from about 500 to about 1,000 board feet.

Each State of the German federation administers its own forests. All of the States practice forestry with success. The results obtained by Prussia and Saxony are particularly interesting, for they show how forests may be kept constantly improving under a system of management which yields a handsome profit.

The Prussian forests, covering nearly 7,000,000 acres, are made up much as if we should combine the pineries of the Southern States with the forests of some of our Middle Atlantic and Central States. When forestry was begun a great part of them had been injured by mismanagement, much as our forests have been, and the Prussian foresters had to solve the problem of improving the run-down forests out of the returns from those which were still in good condition. They solved it with striking success. Immense improvement has already taken place and is steadily going on.

The method of management adopted calls for a sustained yield—that is, no more wood is cut than the forest produces. Under this management the growth of the forest, and consequently the amount cut, has risen sharply. In 1830 the yeild was 20 cubic feet per acre; in 1865, 24 cubic feet; in 1890, 52 cubic feet, and in 1904, 65 cubic feet. In other words, Prussian forest management has multiplied the rate of production threefold in seventy-five years. And the quality of the product has improved with the quantity. Between 1830 and 1904 the percentage of saw timber rose from 19 per cent to 54 per cent.

It is a striking fact in this connection that in the United States at the present time we are using about three times as much timber as our forests grow. If we were everywhere practicing forestry with a resulting improvement equal to that made in Prussia, our forests would be growing as much as we use.

The financial returns in Prussia make an even better showing. Net returns per acre in 1850 were 28 cents. In 1865 they were 72 cents; in 1900, $1.58; and in 1904, $2.50. They are now nearly 10 times what they were sixty years ago, and they are increasing more rapidly than ever.

These results have been obtained in Prussia along with almost ideal technical success. When what is wanted is a sustained yield from the forest year by year in the long run, it is clearly necessary to have always a certain number of trees ready to be cut; there must be a proper proportion of trees of all ages. This percentage has been secured and maintained with almost mathematical accuracy.

In Saxony, which has about 430,000 acres of State forests, the increase of cut under forest management, which always means also a corresponding increase in wood produced, has been nearly as marked as in Prussia. The yield rose 55 per cent between 1820 and 1904, and is now 93 cubic feet per acre—greater than that of the Prussian forests. Since the chief wood is spruce, which yields more saw timber than the average of trees making up the Prussian forests, the increase in the percentage of saw timber in Saxony naturally exceeds the increase in Prussia. It increased from 26 per cent in 1830 to 66 per cent in 1904. The net yearly revenue is $5.30 per acre. The yearly expense is $3 per acre.

These figures are in striking contrast with the corresponding ones for the United States, given in the table on page 20. We spent on our National Forests last year 9 3-10 mills per acre, and out net revenue from them was less than ⅞ mill per acre.

The rise in prices, felt everywhere, accounts only in part for the increased financial returns from forestry in these two States. For while the prices have not quite trebled, the revenue has been multiplied tenfold.

Other German States, smaller, and with better kinds of timber and better market facilities, secure even higher returns. The forests of Wiirttemberg yield a net annual revenue of nearly $6 per acre, and those of several smaller administrations do even better.

A number of the private forests of Germany are managed with great success. As a result of a canvass of 15,600,000 acres of State, municipal, and private forests, it was found that the average net revenue per acre, from good, bad, and indifferent land, was $2.40 a year.

What, then, has forestry done in Germany? Starting with forests which were in as bad shape as many of our own which have been recklessly cut over, it raised the average yield of wood per acre from 20 cubic feet in 1830 to 65 cubic feet in 1904. During the same period of time it trebled the proportion of saw timber got from the average cut, which means, in other words, that through the practice of forestry the timberlands of Germany are of three times better quality to-day than when no system was used. And in fifty-four years it increased the money returns from an average acre of forest sevenfold.

Yet to-day the forests are in better condition than ever before,

and under the present system of management it is possible for the German foresters to say with absolute certainty that the high yield and large returns which the forests now give will be continued indefinitely into the future.

FRANCE.

France has not quite 18 per cent of forest—three-fifths of an acre per capita. This is enough to produce only one-third of the home demand. The country imports annually $30,000,000 worth of wood, and pays $6,000,000 duty and $10,000,000 freight for it. This wood comes from Russia, Sweden, Norway, Austria-Hungary, Germany and America. Of the 23,500,000 acres of French forests the State owns 2,707,000, and the Departments and communes 3,472,000. Since 1827, when the forest code was passed, the State and communal forests have been under management. The State forests yield a clear profit of $4,737,250 a year, or $1.75 per acre; $0.95 is spent for the management of each acre every year.

The best managed State forests yield about 40 cubic feet per acre a year, which is low compared with the yield of some other European forests, such as those of Prussia, Saxony, or Württemberg.

The great achievement of France in forestry has been the establishment of protective forests where much destruction had been caused by floods and winds. From various causes large areas were cleared of forests toward the close of the eighteenth century, and only when it was too late was it realized that these lands were not fit for agriculture and should have been left in forest. To repair the mistake, a movement to reforest began in the nineteenth century. It was an exceedingly expensive mistake. Down to tne present time, encouraged by wise laws, the State, the communes, and private landowners have restored to forest over 2,500,000 acres, and so saved them from ruin. In addition, the resulting forests return an excellent revenue.

Two-thirds of the torrents of Europe are in France. In the Alps, the Cevennes, and the Pyrenees mountains there are 1,462 brooks and mountain streams which are considered dangerous. Nearly a million acres of mountain slopes are exposed to erosion by these streams, to say nothing of the flat land below.

As far back as the sixteenth century there were local restric-

tions against clearing mountain sides, enforced by fines, confiscation, and corporal punishment. In the main these prevented ruinous stripping of hillsides, but with the French Revolution these restrictions were swept aside and the mountains were cleared at such a rate that disastrous effects were felt within ten years. By 1803 the people had become aroused to the folly of this cutting. Where useful brooks had been there now rushed torrents which flooded the fertile fields and covered them with sterile soil washed down from the mountains. The clearing continued unchecked until some 800,000 acres of farm land had been ruined or seriously injured, and the population of eighteen Departments had been reduced to poverty and forced to emigrate. By 1860 the State took up the problem, but in such a way that the burden of expense for reforestation was thrown upon the mountaineers, who, moreover, were deprived of much pasturage. Complaints naturally arose. An attempt was made to check torrents by sodding instead of by forest planting. This, however, proved a failure, and recourse was again had to planting, by the law of 1882, which provides that the State shall bear the costs. Since then the excellent results of planting have completely changed public sentiment. The mountaineers are most eager to have the work go on and are ready to offer their land for nothing to the forest department. In addition to lands secured by gift, the State acquires 25,000 or 30,000 acres a year. Over 500,000 acres have been acquired and more than one-half of this area has been planted. Already 163 of the torrents have been entirely controlled and 654 are beginning to show the controlling effects of the forest on their watersheds. Thirty-one of the torrents now entirely controlled were considered hopelessly bad half a century ago.

It is expected that $50,000,000 will have been spent before the work of reforesting for protection is complete.

The sand dunes on the coast of France, mainly in Gascony, which the winds drove farther and farther inland, wasting the vineyards, have now largely been fixed in place by forest plantations which were begun in 1793. Of the 350,000 acres of sand dunes 275,000 have been planted in forest, and the dunes, instead of being a constant menace to the neighboring farmers, now are growing crops of pine which produce valuable wood and resin. In all, about $2,000,000 was spent in the work and an additional $700,000 was laid out in bringing the forests under

administration. Now, though about one-half of the lands have been acquired by private persons and the State retains only about 125,000 acres, the State has received $120,000 above all expenses, and possesses a property worth $10,000,000, acquired virtually for nothing.

Some 2,000,000 acres of shifting sands and marshes toward the interior of the country, a triangular territory known as the Landes, has been changed from a formerly worthless condition into a profitable forest valued at $100,000,000. Reforestation was begun about the middle of the last century. This work was done principally by the communes, aided and imitated by private owners, and encouraged by the State. The resulting forest produces both pine timber and resin, upon the yield of which the present valuation is based.

La Sologne, in the central part of the country between the rivers Loire and Cher, were once densely wooded, but was for two centuries steadily deforested. By the beginning of the nineteenth century 1,250,000 acres had been utterly abandoned. Owing to the nature of the soil and subsoil, drainage was necessary as a first step toward reclaiming this land with forest. About the middle of the nineteenth century a committee of private citizens, under the presidency of the director-general of forests, began the work of reclamation. A canal 25 miles long and 350 miles of road were built, and 200,000 acres of non-agricultural land were planted with pine. In spite of the fact that one of the species planted proved a failure and another kind of pine had to be substituted, the reforestation work has resulted in a forest property worth $18,000,000, and land which could be bought for $4 an acre fifty years ago is now yielding $3 an acre net annual revenue.

The arid limestone wastes of the province of Champagne have been partly reclaimed by forest planting. Two hundred thousand acres, planted at a cost of $10 per acre, have now risen in value from $4 to $40 per acre, with a total value of $10,000,000 and a net annual revenue of $2 per acre.

The private forests of France are being freely sold. Speculators buy them, strip them, and sell them for grazing purposes. In this way hilltops and hillsides are being rapidly denuded. This threatens erosion and the silting of farm lands in the valleys by the washing down of infertile soil. The terribly destructive floods of the present year could not have been so violent had the hills of France been kept clothed in forest.

In France, then, forestry has decreased the danger from floods, which threatened to destroy vast areas of fertile farms, and in doing so has added many millions of dollars to the National wealth in new forests. It has removed the danger from sand dunes; and in their place has created a property worth many millions of dollars. Applied to the State forests, which are small in comparison with the National Forests of this country, it causes them to yield each year a net revenue of more than $4,700,000, though the sum spent on each acre for management is over 100 times greater than that spent on the forests of the United States.

France and Germany together have a population of 100,000,000, in round numbers, against our probable 85,000,000, and State forests of 14,500,000 acres against our 160,000,000 acres of National Forests; but France and Germany spend on their forests $11,000,000 a year and get from them in net returns $30,000,000 a year, while the United States spent on the National Forests last year $1,400,000 and secured a net return of less than $130,000.

SWITZERLAND.

In Switzerland, which has 2,000,000 acres, or 20.6 per cent of its area, in forest, the communal forests are the largest, and make up 67 per cent of the total; the cantons own 4.5 per cent; and private persons own 28.6 per cent. The communal holdings are constantly growing by the purchase of private lands. The general government, or Bund, owns no forests. From $6,000,000 to $8,000,000 worth of wood (300,000 tons) and wooden ware are annually imported. This comes mainly from Austria-Hungary, southern Germany, and France.

The State forests yield about 64 cubic feet per acre, the corporation forests 42 cubic feet; the average yield of both together is about 45 cubic feet. The average wood growth per acre has been estimated to be 50 cubic feet. In the State forests of Bern the figures show a growth of 50 cubic feet for the plateau country, 73 cubic feet for the middle country, and 75 cubic feet in the Jura. Wood prices, which are higher than in Germany, have been rising for forty years.

The expenditures in forest management vary greatly among the Cantons, ranging from $1.50 to $7 per acre. The net annual returns range from $3 per acre in the forests where least is expended, to $8 or $9 per acre in the city forests, where most is expended.

Forest regulations came very early in Switzerland. The first forest ordinance of Bern was issued 600 years ago. The city forest of Zürich, famous as the Sihlwald, has been managed under a working plan since 1680, and is to-day one of the most perfectly managed and most profitable forests in the world. It yields, on the average, a clear annual profit of $12 an acre. From time to time, as the evidence shows, the Swiss people stood in dread of a timber famine. Ordinances were passed forbidding the reduction of the forest area, the making of clearings, and the exportation of wood from one Canton to another. In the middle of the eighteenth century, as modern industrial life began, various Cantons sought to follow the examples which Bern and Zürich had set in forestry. A severe flood in 1830 brought home the need of more vigorous measures in guarding against torrents. The floods of 1834 and 1868 further enforced the lesson. An investigation of Swiss forest conditions was ordered by the Bund in 1857, and the same year provision was made for an annual appropriation of $2,000 to the Swiss Forestry Association for engineering and reforesting work in the Alps. In 1871 the Bundesrath was empowered to carry on this work, with an annual appropriation of $20,000. After the flood of 1868 $200,000 of the collections made for the relief of the sufferers was devoted to reforestation. In 1876 the Bund assumed supervision of the water and forest police in the High Alps above a certain elevation, and undertook to give aid in the work of engineering and reforesting for the control of the Alpine torrents. Since 1898 the Bund has supervised all this work, and in 1902 the present forest policy was firmly fixed by a revision of the existing law.

All the Swiss forests comprised in the Bund are now classified as protection and nonprotection forests. Whether public or private they are all controlled by the government. In protection forests all cuttings must be such as to preserve the protective value of the forest cover intact, and for this reason clean cutting is usually forbidden. In such forest stumpage sales are forbidden, and all wood must be felled and measured under the direction of a forest officer. Otherwise, privately-owned protection forests are supervised in the main as are those publicly owned. Nonprotection forests are also subject to a number of regulations. When they are in private hands clearings may be made only with consent of the Canton, logged areas must be reforested within three years, and existing forest pastures must be maintained.

Where protection forests can be created by planting, this may be ordered, and where forests are converted to farming land or pasture an equal area may be ordered reforested. Where barren ground is required to be forested for protective purposes, the Bund assists by paying from 30 to 50 per cent of the cost. Between 1876 and 1902 16,000 acres were reforested at a cost of $1,000,000, in round numbers, the Bund having paid one-half.

Grazing has been regulated for centuries. In protection forests it is entirely prohibited; but on all the rest of the forests great success has attended the efforts of the forest service to safeguard both pasturage and the forest by supervision and range improvement. Despite differences in local conditions, the experience of Switzerland in forest grazing is, therefore, strongly in support of the policies which are directing the efforts of our own Forest Service. Indeed, the experience of all Europe shows the necessity of controlling the public range.

To sum up, forestry in Switzerland, where every foot of agricultural land is of the greatest value, has made it possible for the people to farm all land fit for crops, and so has assisted the country to support a larger population, and one that is more prosperous, than would be the case if the valleys were subjected to destructive floods. In a country, as small as Switzerland, and one which contains so many high and rugged mountains, this is a service the benefits of which can not be measured in dollars. It is in Switzerland also, in the Sihlwald, that forestry demonstrates beyond contradiction how great a yield in wood and money it may bring about if applied consistently for a number of years.

Norway, Sweden and Denmark.

Norway.

Only 21 per cent, or 20,000,000 acres, of Norway is in forest. The State owns less than 2,000,000 acres of this. Of the forest region one-half has to import timber, one-fourth has sufficient for its needs, and one-fourth is able to export over 1,000,000 tons, valued at $18,000,000 a year. Nearly two-thirds of the exports go to England and most of the rest is divided up between Belgium, Australia, France, Holland, Germany, and Denmark. The total annual cut, one-fifth of which is exported, is about 500,000,000 cubic feet. It exceeds by 1,500,000 cubic feet the amount of wood grown by all the forest in the same time. In other

words, the cut is far too heavy to last, so that a reduction of wood exports is inevitable.

Forestry is on a low level. The various provisions for the better use and protection of the forests, which began three hundred years ago, have been of too half-hearted a nature to meet the situation. There is a forest service, but the officers are few and underpaid, and the districts under their care—sometimes several million acres to each—are far too large for effective work. Moreover, there are difficulties over the forest rights which were earlier granted to encourage the development of the country, but which are now greatly in the way of establishing property rights and organizing an administration.

Since 1860 the State has been buying cut-over lands in order to plant them to forest where forest protection is needed, and from $15,000 to $20,000 a year has been spent in this way during recent years.

The communal forests are supervised by the Government, and are usually managed by the foresters with a view simply to supplying local needs. Sales outside the parishes are permitted only where there is more than enough for these needs.

SWEDEN.

Sweden has nearly 50,000,000 acres of forest, covering nearly 50 per cent of the total land area. Since the English import duties were abolished in 1866 the wood exports from Sweden have steadily increased, till now Sweden stands next to Russia, the world leader, in wood exports, with $54,000,000 worth a year, representing nearly 4,500,000 tons. England takes half of this, followed by France, Denmark, Germany, Holland, Cape Colony, Australia, and South America. The total cut from the forest is estimated to be near 1,000 million cubic feet.

The State owns about 13,500,000 acres, or 33.2 per cent, and controls 4,000,000 acres more. The State lands are, in the main, of lesser commercial value, and this fact, together with the existence of logging rights granted in the past, keeps the net income for the present down to 12 cents an acre. Nevertheless, since 1880 the net revenue from the State forests has risen from $300,000 to nearly $2,000,000 a year.

Up to five hundred years ago Sweden was overburdened by forests, but by that time cutting and wasting had gone so far that

the willful setting of forest fires was forbidden. In 1638 overseers of communal forests were appointed in order to conserve supplies of wood for charcoal used in the iron industry. A general law followed in 1647, and a director of forests in the two southern districts was appointed in 1720. All through the eighteenth century, restrictions upon forest use were in force. Toward the close of the century there was, indeed, a premature scare over a possible timber famine. Yet, despite this legislation, and much legislation which followed, waste continued to go on. While measures were being passed to conserve the forests, the communal forests and town forests were actually being sold. It was not till the law of 1903, which went into effect in January, 1905, that a satisfactory policy was secured. In general, this requires the practice of forestry. As in Russia, provincial forest protection committees have to approve the local felling plans. A diameter limit is set, below which trees may not be cut. Clearings are forbidden, and cleared land, unless used for other purposes, must be reforested. Pasturing is restricted where it would do harm.

In the past thirty-five years the State has increased its forest holdings by 45 per cent through the purchase and reforesting of wastes and sand dunes and by the settlement of disputed titles. The purchases amount to over 600,000 acres, for which an average price of $5.30 an acre was paid.

Lumbering is carried on much as it is in the United States. The State, as a rule, sells stumpage, and the timber is removed by contractors. Management is by no means so detailed and intensive as in Germany or France. The trees which are to be cut are marked, but no attempt is ordinarily made to prepare complete working plans. Only a moderate amount of planting is done to secure the future crop, and natural reproduction is mainly relied upon.

Forest fires continue to do great damage, especially in the northern part of the country. A forest patrol is doing effective work, however, in checking the spread of fires.

DENMARK.

Denmark has about 600,000 acres under forest, of which the State owns over 23 per cent, or 142,000 acres. About 75,000 acres of wastes are in process of reforestation.

The need of wiser forest use was felt in the eighteenth century, and by 1781 the State forests were placed under administration. But the clearing of the forest continued at such a rate that in 1805 it was provided that the still existing forests of beech and oak should be maintained forever. Further, provision was made as to the selling of the peasants' farms, so that they should not be accumulated in large holdings upon which the peasants would have to depend for their wood.

Since 1820 the forest area has been increasing. At present reforesting is adding to it very considerably. Nearly 200,000 acres of heath have been planted in the last forty years. To this work of reclamation the State contributes $40,000 a year.

In State forests, as well as in the communal forests and the farmer's woodlots, forestry is carefully and profitably practiced.

FOREST RESERVES AS GAME PRESERVES.

As Ex-President Roosevelt has so well pointed out, the National forests as well as the forest reserves maintained by the various states are intended for the fullest and best use consistent with their protection, and one of the most natural uses to which a portion of the reserves should be put is as game preserves for all kinds of wild game.

As stated in this report the forest reserves in time should be used very extensively as a summer resort and by campers, hunters and fishermen. Much of the attraction of the reserves will depend on whether there is good hunting and fishing, and if these are provided sportsmen and tourists will spend a large amount of money in the state.

Wisconsin propagates through its fish hatcheries many kinds of fish to stock the waters but so far the state has done nothing outside of enforcing the game laws towards maintaining or increasing the supply of wild game. Now that the state has a forest reserve it would not entail a great expense to enclose, say, 10,000 acres within a game proof wire fence and authorize the State Fish and Game Warden to use such funds as are available from time to time in stocking it. The area to be enclosed should include lakes and forests so as to have favorable conditions for raising such valuable fur bearing animals as mink, beaver and otter, game birds such as partridge and pheasant, also white and black tailed deer and possibly in time moose, caribou and elk, As the game increased it should be distributed in all parts of the forest reserves and in other parts of the state where it would receive adequate protection. The area of the game preserve could be increased when necessary and one or two forest rangers could easily look after the game and still be able to attend to a good deal of forest work. It is hoped that the legislature will authorize the State Fish and Game Warden and the State Board of Forestry to co-operate in establishing and gradually stocking a game preserve.

THE STATE WILL LEASE CAMP AND COTTAGE SITES.

The State Board of Forestry has adopted the policy of leasing camp and cottage sites upon the shores of the beautiful lakes within the forest reserve. Owning several thousand acres of land upon the shores of some of the most attractive lakes in Oneida and Vilas counties, the state is easily able to meet all present demands and can lease sites to suit almost any taste.

From ten to twenty acres will be leased to one person or family and as much more to a club or association as they may really need. Leases can be given for a period of twenty years with the privilege of renewal and the yearly rental will vary from $10 to $50 according to the size of the lot required, its location and the amount of timber upon it. The contract between the state and the lessee is very simple, merely providing that the lessee will cut only such timber as is marked for cutting by the forester, pay the local price for such logs as he may use in building, use all possible care in building fires, agree not to sell liquor on the premises or to sublet without the consent of the Board. For a small additional sum, merely sufficient to cover the cost, the forest rangers will look after a camp or cottage during the winter months, or while the owner is away.

The Forestry Board however have no cottages to rent, nor can they build cottages or sell the building materials, except logs from the forest reserve. Cottage sites will be leased not only to residents of Wisconsin but of other states as well.

The forest reserve region should become in time a great summer resort for people throughout the entire Mississippi valley, as it has a fine, bracing dry climate, pine forests and sandy soil and is blessed with many of the finest chains of lakes in the entire country. Vilas county in particular has a greater area of water than land and long trips can be made by launch or canoe. There is plenty of sport both for hunters and fishermen and the resorts furnish good beds and excellent board at reasonable prices.

The summer resort business in northern New York state amounts to approximately $10,000,000 a year, this amount being

paid by the tourists, as they are called, in railroad fares, to hotels, boarding houses, and for guides, teams, boats, etc. New Hampshire does about as well and the summer business gives the old state of Maine nearly $20,000,000 a year.

This shows that it will well pay Wisconsin to protect its beautiful northern lakes, but if the lake shores and surrounding forests are ruined by annually recurring fires they will cease to be attractive in any sense and the summer trade will go elsewhere.

It would seem that there should be many families in the state who would like to avail themselves of this opportunity to secure an attractive site upon one of the lakes within the forest reserves. The Board is anxious to encourage the best utilization of the forest reserves as far as possible, and it is believed that the forest reserve region especially in Oneida and Vilas counties is far more valuable for development as a great resort than for any other purpose, and if this area is protected and everything done to make it attractive, it will mean lasting prosperity for all the residents of that section.

Those applying for cottage sites should specify the lake where they wish to build, or if they art not familiar with the lakes they should state whether they wish to be near the railroads and public resorts or farther back on some lake away from all the signs of civilization.

The State Board of Forestry can supply maps showing the location of all state forest reserve lands on the lakes, and also detailed information as to any particular lot.

HEADQUARTERS OF THE FOREST RESERVE.

Big Trout lake in Vilas county is in the heart of the forest reserve and in many respects is so favorably located that the headquarters camps will be established there. A small cabin has been built for the use of the rangers who have been employed in cutting fire lines and in clearing the site for the tree nursery.

In the summer of 1911 it is planned to build a camp for the Assistant State Forester, who is in direct charge of the field work on the reserves; a larger camp for all the men who will be employed at or near Trout lake, a tank to supply water to the nurseries, and ice and boat houses.

The state owns six miles of shore line around the lake, and also a very fine growth of Norway pine which stands on a point that extends into the lake from the east shore. Several fire lines must be cut and cleared so that this pine will be absolutely protected from fire; and much of the shore line of this most beautiful lake, which has been cut over and burned, must be planted with young pine.

Just back of the camps a site will be cleared for a large tree nursery, as the state owns thousands of acres of cut-over lands in this region that must be planted just as soon as they can be protected from fire.

The State Board of Forestry would not have been justified in planting its scattering lands, as it could not protect such tracts from fire, but has been compelled to wait until it could purchase the necessary lands to at least partially block up its holdings. The Board has been criticised for this apparent procrastination by those who did not understand the situation.

Most of the young pines will be planted when two to three years old and it is hoped that within this time the state will have acquired enough additional land so that the work of reforestation will not be further delayed.

In addition to the nursery at Trout lake, at least two more large nurseries will be required in order to avoid the heavy expense or hauling the nursery stock long distances. One of these nurseries will probably be established on the south shore of Tomahawk lake and the other on or near Rest lake.

RE-ESTABLISHING LINES AND CORNERS.

The original government surveys in northern Oneida and Vilas counties in the heart of the present forest reserve area were done fairly well and the witness trees were plainly marked and the corners well established. Cutting out such corner or bearing trees should have been punished by a heavy fine, but unfortunately this has not been done and so many of the corners have been destroyed by cutting that they must be again established.

It is proposed to make the section corners and quarter posts out of concrete, and to color the concrete red so that they can be easily seen in the woods and quickly located. For most sections of the reverse the concrete posts can be made at the various ranger cabins and then hauled to where they are to be set up. Where this is too difficult or expensive, iron piping painted red and with a brass cap for the lettering, will be driven into the ground.

The divisions of the forest reserves will be by blocks or compartments, according to the topography, or the manner in which the reserves are naturally divided by rivers, lakes or fire lines, rather than by townships or sections. Still it is important while the location of many of the old corners is still known to re-establish them, and as the state may find it necessary or expedient in future years to sell small tracts for farming or other purposes, it is very important that the original corners and lines should be retained.

RANGERS FOR THE FOREST RESERVE.

A very large amount of work must be done upon the forest reserves in order to protect them from forest fires and also to place the forests, as soon as possible, in such condition that they will begin to yield a steady and increasing revenue to the state.

Since the establishment of this department in 1905 the main work of the Assistant State Forester and the cruisers has been the examination of the forest reserve lands that on account of being badly scattered or agricultural in character, should be sold, and the examination and appraisal of lands to be purchased and added to the forest reserves. This has been a very large piece of work but the examination of the lands to be sold is now practically completed and a large portion of the lands to be purchased have been examined and appraised. By the purchase of lands some parts of the forest reserves have now been blocked up enough so that we are justified for the first time in cutting fire lines, clearing roads and trails, and starting our nurseries to reforest the lands that have been denuded by repeated fires in past years.

The headquarters camp for our main work will be located at Trout lake in Vilas county, and here also we will lay out one of our largest nurseries. At first only about twelve forest rangers will be employed but later on as the work develops, the force will be gradually increased. Cabins will be built for the rangers and their families to live in and they will be located at the most dangerous fire points, so that if fires do occur we will have a trained fire fighter on the spot.

All the ranger cabins will be connected with the headquarters camp by telephone so that when a fire breaks out in any one of the ranger districts, the forester in charge can call all his men together in the shortest possible time. Watch towers, or lookout stations will be built on high knolls, ridges, or other favorable points and in dangerously dry weather men equipped with telescopes will be stationed in them every day with instructions to at once telephone information of any fire, or even smoke, to the nearest ranger and to the headquarters camp.

Each ranger will be obliged to keep one or two saddle horses, as in this way they can cover their districts much more rapidly and save their strength and energy for the various kinds of hard work they will be called upon to do. Such work will consist in building roads, trails, fire lines, telephone lines, building their cabins and camps, burning brush and slash, marking mature timber to be sold, laying out nurseries and planting denuded areas, and the hardest work of all, fighting fire.

These rangers will be appointed after Civil Service examinations so practical in character that there should be no trouble in selecting men well equipped for the work and who can be taught the rudiments of forestry that it is essential that each ranger should know. The men must have tact, as they will come in contact in their work with settlers, lumbermen, resort and cottage owners, campers, hunters, fishermen, etc., and must know how to treat them pleasantly and respectfully, and still strictly enforce the laws and regulations governing the forest reserves. They must be good woodsmen and good axemen, with a natural liking for the woods and the life of the pioneer. The men will be paid $50.00 to $90.00 per month and their promotion should depend absolutely upon their ability, energy and general fitness and not in the least upon their age or length of service.

BUILDING FIRE LINES, ROADS AND TRAILS.

Fire Lines.

Fire lines, or fire lanes as they are sometimes called, are strips from 100 to 300 feet wide which are cut through the forest and cleared of all inflammable material, and as an additional safeguard a strip is then plowed. The following account of the Michigan Forestry commission shows their opinion as to the value of such fire lines.

".....The lines are first surveyed and brushed out, and are then plowed with an ordinary breaking plow, the plowed strip varying from ½ to 1 rod in width. From the experience with railway dumps, roads and abandoned fields it is evident that in these level sands, such lines are not readily effaced by the growth of brush and weeds, but remain bare and useful as fire lines for a considerable period, when they can readily and cheaply be freshened up by a disc plow or harrow. The work of constructing these lines was begun in 1905. Over 30 miles of these lines have thus far been plowed out in the rough and the principal network of fire lines for District No. 1 is completed. On the 'plains,' the Jack pine and scrub oak lands with a sparse growth of timber and brush, these lines are as complete as is desired, the plow work being perfect in every detail.

"On the cut and burned-over lands, where large pine stumps, together with brush and coppice growth of oak, etc., present a great variety of obstacles, the first plowing is rough and rather incomplete and the lines will require time and some further improvement to be put in a perfectly satisfactory condition. Nevertheless there is not a rod of these lines which would not stop without any help, any ordinary fire, unless a heavy wind, a hot fire and warm, mid-day conditions should conspire to make the case especially difficult. In actual fighting of fire, these lines will prove of greatest value, and it is evident today that one man with these lines, could do more than a hundred men without them and, what is equally important, do it with far more certainty. 'You are fighting fires before you have any,' a workman correct-

ly put this matter. As to cost of construction these lines vary within wide limits. On the 'plains' they can be brushed and plowed out for as low as $5.00 per acre, or $10.00 per mile, while in 'brushy' lands, with large stumps, and especially on sloping ground, the expenses rise to three and four times the above amount.

"While summer is a good season for work of this kind, our experience would indicate that early spring is better; the ground is more bare, the ground cover is crushed down by the winter's snow, the soil is moist, the weather is cool and the horses suffer less from the ever present insect pest of the region. Single teams of heavy horses have proven more satisfactory than the employment of four-horse teams, especially so in brush and stump lands."

In our reserves the fire lines will rarely be built along the section lines but rather so as to connect two lakes, or a lake or river with a swamp or road. There are so many lakes, rivers and streams within the reserves that by careful selection we can build comparatively short fire lines that will divide the reserves into blocks, so that if a fire does start it can be held to the block in which is originates and will do only a relatively small amount of damage.

The very numerous lakes and streams, supplemented and joined together by broad fire lines kept clear of all inflammable material, should insure our forest reserves against the possibility of any general and widespread destruction by forest fires. This is a most fortunate situation and removes one of the greatest obstacles to the successful forestry management of large tracts of forest land.

Roads.

In order to provide means of communication, so that all parts of the reserve can be reached quickly and easily, several hundred miles of roads and trails must be built. Fortunately most of the reserve already has many miles of old logging railroads and these with a comparatively small amount of work can be made into very fair wood roads, and as many of them are graded they will form important auxiliary fire lines. Not all of the old rights of way are located so that they can be used as roads but all of them will be cleared of brush and other inflammable material and their having been built through the forest reserve will save the state

thousands of dollars in the construction of fire lines. Probably only a few new roads will have to be cut and these only from the railroads to the nurseries and camps to which it will be necessary to haul heavy supplies.

TRAILS.

The foresters and rangers will be mounted on strong and tough western horses so that they can cover their districts rapidly and get to fires with the least possible delay. However there is so much down timber, young growth and brush on most of the lands that it is practically impossible to travel advantageously on horseback in most directions unless plenty of good trails are built.

It should be remembered that these trails are not simply of value as bridlepaths, but will also be extremely valuable in the protection of the reserve as they will act as small fire lines and will check thousands of surface fires. The trails will also be built as far as possible so as to follow the ridges, as the rangers can then see much more of the country as they ride over the trails.

PROPOSED FOREST RANGER SCHOOL.

There is a growing danger in this country that the number of technically trained foresters who are being graduated in increasing numbers from the various forestry schools in the country will exceed the demand, for until lumber companies and timberland owners more generally adopt the principles of forestry in the management of their forests, the employment of foresters will be largely confined to government and state work. There is always a danger in the early periods of any new profession of overdoing it and also a strong temptation to cut down the instruction to as short a time as possible.

It is felt that Wisconsin should not start a forestry school as she can secure the foresters that will be needed from the well equipped schools at the Universities of Michigan and Minnesota. Through the establishment of the Forest Products Laboratory of the Forest Service at the University of Wisconsin, the University has an exceptional opportunity to train men in the best methods of utilizing all forms of forest waste. The university is now offering the first year's courses in this study and it will have a very large and growing field to cover in this line of work.

Wisconsin, however, needs a school for forest rangers, for the time has now come when the state requires the services of a number of well trained rangers and there are a large number of lumber companies and timberland owners who will be only too glad to secure men who not only understand the practical details of lumbering, cruising and surveying, but who have had training in forestry methods as well. Young, strong men who have worked in the woods should be given the preference and the school should be located at a camp in the forest reserve as all the instruction in woods work should be practical and given in the field. It may also be found necessary to give the men some instruction at the University in connection with the work of the College of Agriculture, but if they spend two summers in the forest reserves and one winter at the University they should be well fitted for their work.

It is recommended that the State Board of Forestry be authorized to establish a forest ranger school in co-operation with the University and that while on the forest reserves the men should be given their board and lodging in the camps and $1.50 per day for the time they are actually working for the state and not receiving instruction.

COUNTY FOREST RESERVES.

In nearly every county in the state there are areas that are not suitable for agriculture but that should be used for forests. Some counties contain only small tracts of such true forest land but in others such areas are very much larger and their proper utilization therefore becomes of great importance. It will be many years before the state can attempt the management of all such tracts and it is felt that in most cases it would be much better for the counties to own and manage their own forest reserves.

Up to as late as 1900, thousands of acres were yearly forfeited to the northern counties for non-payment of taxes, for the lumbermen in those days felt that when the timber was removed the land was of little if any value. The counties were anxious to get such lands back upon the tax rolls and therefore they auctioned them off and large tracts were sold for 20 to 25 cents per acre. If, however, the counties had retained all true forest land and protected the large amount of now valuable timber that was then left, they would now be receiving a very considerable revenue from such lands and could look forward to large future profits. At present very little land is being forfeited for non-payment of taxes and therefore the counties have largely lost the opportunity that they had a few years ago of acquiring lands for nothing.

The price of the agricultural land will advance as its value becomes better known, but the speculative holders of non-agricultural land will gradually let go of such holdings and the counties will then be able to acquire them at their true values. Communal forests are very common in Germany, Switzerland and other European countries and those that are well managed pay net annual revenues of from $2 to $9 per acre, the average probably being about $3. The result is that the citizens of many such communities are not obliged to pay taxes of any kind, the revenues from the forest being sufficient, and they also have the best possible schools and roads besides frequently receiving their fire wood free of cost. Many people will, doubtless, say that

this is too socialistic, but forestry from the very fact that it is a long time investment can be more successfully carried on by the state or county than by the individual. Many counties in northern Wisconsin could now acquire tracts of true forest land at a very reasonable price which in a few years would produce a handsome annual revenue that could be applied to reducing taxes or providing better roads and other local improvements. Those counties will secure the greatest permanent prosperity that develop every acre to its truest and highest usefulness, and therefore it is recommended that the counties be authorized by law to acquire forest reserves and that the State Board of Forestry, upon request, may co-operate with any county in the acquisition, protection and management of such reserves.

Director Johan Hirsch, formerly president of the National Agricultural College of Norway, makes the following statements in regard to the forests that are owned by the communes in Norway. (The commune is the smallest government subdivision, corresponding to our township system in Wisconsin.)

"Many of our communes buy timber lands. They receive assistance to do so from the state, which in most instances loans the district the necessary funds. Trysil commune has bought timber lands twice, first about ten years ago for about $70,000 and again last year for about $900,000. The first purchase has been paid for from the timber cut. On the tract last purchased there was cut last winter over $215,000 worth of timber and this winter a like quantity will be cut. It has plainly proved a profitable undertaking.

"This commune, Faaberg, bought last year 8,000 maal of timber lands (a little less than 2,000 acres) for which it paid about $21,000. This winter we will cut without any injury to the forest about $8,000 worth of timber. The commune of Vardal has bought timber land for about $688,000."

The "Skandinaven," Chicago, publishes a letter from its correspondent in the community of Trysil, dated November, 1910, which brings the condition of forestry in that district down to date. A translation of the article is as follows:

"Trysil commune was the first commune in this country that bought forests on a large scale. In 1891 it bought 100,000 maal from an English company. Originally this forest was sold off from different farms in Trysil. The commune paid about $53,000 for the timber. It was then appraised at about $60,000. Smaller parcels were added later.

"When the commune in 1906 made its last purchase, the timber lands first bought had not been paid for entirely from the timber cut. As these lands had to be mortgaged in connection with the latest purchase, an appraisal was made of the lands bought in 1891. This appraisal amounted to not less than $150,000, and even this was considered low by many men acquainted with local values. In 15 years, therefore, the forests had not only paid for themselves but increased in value nearly three times. It may easily be comprehended that Trysil was strongly in favor of new purchases in 1906. These new purchases had an area of 350,000 maal. The entire forest now controlled by the commune is thus between four and five thousand maal, or from one-fourth to one-fifth of the entire forest area contained in the commune. (A maal slightly exceeds four acres in area.) Before closing the deal the commune appraised the forest in question, which appraisal amounted to about $950,000, not including the land fit for agriculture. The purchase price was about $840,000.

"Lumbering has been going on in these forests for four years, resulting in a net profit of about $390,000, thus leaving the balance of the purchase price on June 30th of this year about $580,000. . . . Of the original loan in the Christiana Savings bank of $195,000 there now remain two payments of $50,000 with interest which will presumably be paid through the cut of 1910–1911. . . . The purchase of forests has been of great benefit to the community in many respects. The commune has been able to provide cheap lands to many new settlers, while the lumbering has been done by the people of the neighborhood, thus furnishing them steady work. It may also be mentioned that other work for the improvement of the forest has been undertaken. Thus ditches have been dug to the extent of 100,000 metres (in the neighborhood of 63 miles). This has been particularly fortunate for the laboring people in the summer time. . . .

"It may be stated also that the forests in the cut-over sections have not from the forester's standpoint been cut too closely, but rather the contrary. The sections cut over have on the whole yielded very good results compared with the appraisals."

FOREST FIRES IN 1909 AND 1910.

The forest fires of 1908 were the most extensive and destructive that had occurred for many years, burning over 1,000,000 acres and destroying merchantable timber and young growth valued at $9,000,000. In view of the widespread and lasting destruction of the forests the State Board of Forestry strongly recommended that a forest fire patrol system should be organized to prevent as far as possible the starting of forest fires. This recommendation was criticised in some quarters upon the ground that the board was advocating a system to meet unusual conditions and that such destructive fires as swept the northern portion of Wisconsin in 1908 would probably not occur again for many years. Such a delightfully easy way of doing practically nothing to check the fires and taking chances on the future was apparently endorsed in 1909, as the rains were frequent throughout the summer and only 166,000 acres were burned over with a total loss of $104,000. However, the long and dangerously dry weather during the summer of 1910 caused forest fires to start in all directions and as the year closes we find that 892,000 acres have been burned over with a loss of over $5,000,000.

A wise man, or a wise state, should not need to be taught the same severe lesson more than twice in the course of three years. What our pleasantly optimistic friends call "unusual" years occur only too frequently, but the real reason why the forest fires in northern Wisconsin are so much more destructive than in the past is because the hemlock and hardwood forests, which formerly checked the fires, are now being cut so heavily that their value as "fire breaks" is being rapidly destroyed and therefore the fires are much more extensive and destructive. The urgent need of a well organized forets fire patrol to prevent fires is fully explained in this report. Following are summaries of the forest fires in 1909 and 1910.

REPORT OF FOREST FIRES IN WISCONSIN FOR 1909.

Counties.	Fires since January 1.	Total number acres burned over.	Number acres merchantable timber burned over.	Number acres second growth burned over.	Number acres without timber burned over.	Merchantable timber destroyed (feet).	Value of timber destroyed.
Ashland	6	1,785	163	80	1,542	480,000	$1,440
Barron	3	1,020	.....	300	720	.....	.....
Bayfield	18	8,760	972	5,460	2,328	541,200	6,840
Burnett	14	11,170	300	2,270	8,600	105,000	275
Chippewa	16	460	220	120	120	.....	200
Clark	27	10,440	280	7,580	2,580	12,000	243
Douglas	6	870	.....	200	670	.....	.....
Dunn	2	1,015	.....	200	815	.....	.....
Dodge	5	6,000	.....	.....	6,000	.....	.....
Eau Claire	32	3,500	500	1,500	1,500	.....	.....
Florence	1	100	.....	.....	100	.....	.....
Forest	7	12,465	3,410	3,300	5,755	100,000	500
Iron	7	1,251	51	350	850	300,000	600
Jackson	32	34,340	100	4,540	29,700	100,000	200
Juneau	6	10,700	.....	4,100	6,600	.....	.....
Langlade	2	145	25	120	.....	10,000	600
Lincoln	15	1,529	373	599	557	572,000	1,104
Marathon	18	1,117	133	545	439	35,000	200
Marinette	22	3,526	400	771	2,355	25,000	1,625
Monroe	2	760	80	300	380	.....	300
Oconto	19	2,500	305	1,208	987	530,000	1,625
Oneida	13	3,298	207	1,305	1,786	135,000	650
Polk	3	2,445	1,000	300	1,145	.....	.....
Portage	18	2,726	142	580	2,004	130,000	860
Price	19	15,678	221	7,202	8,255	553,000	1,210
Rusk	10	309	20	10	279	100,000	200
Sawyer	.....	.....	.....	.....	.....	.....	.....
Shawano	3	4	.....	2	2	.....	.....
Taylor	17	395	7	120	268	9,900	121
Vilas	8	1,450	160	1,290	.....	400,000	2,400
Washburn	16	5,035	1,665	1,220	2,150	10,000	400
Waupaca	.....	.....	.....	.....	.....	.....	.....
Wood	45	21,958	340	2,250	19,368	20,000	200
Totals	412	166,751	11,074	47,822	107,855	4,168,100	$21,793

REPORT OF FOREST FIRES IN WISCONSIN FOR 1909—Continued.

	Value of young growth destroyed.	Total value of all forest products.	Value of improvements destroyed.	Value of live stock killed.	Number of men employed by towns in fighting fire.	Number of men employed by timber owners fighting fire.	Expense to towns for fighting fire, posting notices, etc.	Expense to timber owners for fighting fire.
					3	22	$58.50	$40.00
Ashland	$50	$1,678				8	7.00	20.00
Barron	500	500			135	10	384.83	10.00
Bayfield	3,400	10,240	$1,005.00		24	35	37.35	35.00
Burnett	590	3,140	90.00			40	39.20	125.00
Chippewa	150	525	180.00		108	62	295.75	100.50
Clark	33,915	35,168	1,700.00		46	36	76.20	2.00
Douglas					5	30	19.50	40.00
Dunn	100	100	50.00		5		5.00	
Dodge							38.70	
Eau Claire							11.50	
Florence		15			30	128	101.20	485.00
Forest	1,202	7,005			21	58	80.50	200.00
Iron	3,400	4,600			83	86	239.02	470.00
Jackson	8,100	8,380	1,050.00		69	43	298.82	35.00
Juneau	3,300	3,300	2,100.00				70.85	
Langlade	3,000	3,600			48		97.05	50.00
Lincoln	1,525	3,294	550.00	$150	51	22	87.15	23.00
Marathon	1,065	1,385	2,704.00	40	31	51	203.65	144.50
Marinette	2,250	4,035	2,300.00			20		
Monroe	200	500			10	13	87.25	85.00
Oconto	1,225	2,950	15.00		47	10	262.89	50.00
Oneida	140	1,870	100.00				23.00	
Polk	100	100	50.00		57	50	270.25	500.00
Portage	700	1,660	125.00	100	61	23	313.05	135.25
Price	340	2,125	175.00		28	11	64.55	20.00
Rusk	50	300					27.50	
Sawyer					7	40	87.75	50.00
Shawano	50	50	350.00		12	56	354.11	6.00
Taylor	116	492			8		100.00	
Vilas	1,000	3,400	36.50		58	9	18.80	50.00
Washburn	1,300	2,300					5.00	
Waupaca					250	132	387.80	137.00
Wood	1,100	1,300	1,068.00					
	$68,868	$104,012	$13,648.50	$710	1,197	995	$4,153.72	$2,813.25

REPORT OF FOREST FIRES IN WISCONSIN FOR 1910.

Counties.	Fires since January 1.	Acres burned over.	Amount of timber destroyed (feet).	Value of timber destroyed.	Value of young growth destroyed.	Total value of all forest products.	Expense to the counties.
Ashland	38	20,583	27,617,000	$82,851	$102,915	$185,766	$947.61
Barron	26	10,170	.....	.....	50,850	50,850	77.65
Bayfield	173	132,995	36,274,400	108,822	664,975	773,797	3,359.47
Burnett	52	82,160	250,000	1,600	410,800	412,400	1,225.21
Chippewa	20	6,610	682,000	4,800	33,050	37,850	182.94
Clark	34	19,520	.....	.....	97,600	97,600	140.70
Dodge	5	2,575	.....	.....	12,875	12,875	66.05
Douglas	67	71,996	9,400,000	33,000	359,980	392,980	4,304.67
Dunn	16	3,735	50,000	225	18,675	18,900	41.25
Eau Claire	3	200	.....	.....	1,000	1,000	43.91
Florence	11	1,080	103,600	525	5,400	5,925	117.60
Forest	42	7,263	2,170,000	12,000	36,315	48,315	2,405.90
Iron	31	42,700	4,101,300	22,000	213,500	235,500	1,344.17
Jackson	33	21,048	.....	.....	105,240	105,240	298.75
Juneau	4	3,900	.....	.....	19,500	19,500	31.80
Langlade	51	27,350	55,020,000	282,000	136,750	418,750	2,423.89
Lincoln	49	20,041	5,430,000	32,800	100,205	133,005	2,735.80
Marathon	61	26,581	2,593,000	13,000	132,905	145,905	1,759.43
Marinette	40	10,375	2,450,000	6,000	51,875	57,875	989.00
Monroe	1	.....	.....	.....	.....	.....	14.25
Oconto	43	11,115	10,070,000	58,000	55,575	113,575	1,173.46
Oneida	68	59,650	31,335,000	103,000	298,250	401,250	2,735.04
Polk	26	14,243	85,000	400	71,215	71,615	195.75
Portage	28	3,532	.....	.....	.....	.....	327.46
Price	69	66,397	2,330,000	113,800	331,985	445,785	5,683.01
Rusk	54	9,445	535,000	2,500	47,225	49,725	1,248.57
Sauk	2	2	.....	.....	.....	.....	26.37
Sawyer	34	62,930	4,700,000	20,000	314,650	334,650	1,474.69
Shawano	35	9,787	1,337,000	25,700	48,935	74,635	1,256.00
Taylor	52	29,703	5,730,000	32,000	148,515	180,515	3,398.84
Vilas	41	39,858	6,650,000	42,000	199,290	241,290	2,148.00
Washburn	47	55,040	.....	.....	275,200	275,200	194.85
Waupaca	9	162	.....	.....	810	810	.....
Wood	42	20,087	.....	.....	.....	.....	959.32
Totals	1,307	892,833	208,913,300	$997,023	$4,346,060	$5,343,083	$43,331.41

CAUSE OF FOREST FIRES.

1909.

Engines	15½	per cent.
Settlers clearing land	46	per cent
Hunters and campers	6¾	per cent
Miscellaneous	16¼	per cent
Unknown	15½	per cent
	100	per cent

CAUSE OF FOREST FIRES.

1910.

Engines	21½	per cent
Settlers clearing land	28½	per cent
Hunters and campers	5½	per cent
Miscellaneous	7½	per cent
Unknown	37	per cent
	100	per cent

RAILROADS AND FOREST FIRES.

As stated elsewhere in this report, our records show that from 1904 to 1908 railroad locomotives caused only about 5% of the forest fires in Wisconsin, while the settlers in burning brush and clearing land were responsible for from 60 to 70%. In 1908, however, the railroads were charged with 15% and this sudden rise was accounted for by the fact that so little rain fell during the summer months that the ground became like tinder and the least spark from a locomotive would start a blaze. The summer of 1910 was also very dry and in July and August the whole northern part of the state became so inflammable that the locomotives set hundreds of fires, many of which did an enormous amount of damage, and the reports of the fire wardens show that the number of railroad fires increased very largely over the record for the last few years, and that we must charge them in 1910 with 21%.

For over two years the State Board of Forestry has been working with the railroads in Wisconsin to prevent the starting of forest fires by locomotives. An engineer was appointed to inspect all the locomotives in use in the northern part of the state to determine if they were equipped with the most practicable netting to prevent the escape of sparks or cinders, as is provided by law. The inspector sometimes found holes in the front end nettings and ashpan nettings, and that the ashpan nettings are too light to stay down in place or hold their shape.

The nettings are not the most serious matter, however, but rather the holes around the steam pipes, stand pipe, blower, pump exhaust and around the edges of the smoke box and deflector plate. After more than a year of inspection work we found that such holes formed so rapidly that no amount of the closest and best inspection would solve the problem, but that the thing to do was to find a spark arrester that would absolutely prevent the escape of sparks and still allow the engine to steam freely and pull its load. Our engineer, therefore, set to work to experiment with various spark arresters and he finally designed one that

seemed to be a step in the right direction. The Chicago & North Western railroad made the castings in their Chicago shops and the arrester was thoroughly tried out on one of their freight engines. It proved to practically prevent the escape of all sparks, and the engine would steam freely and pull its full load provided the fireman fired frequently and evenly, but if he shoveled in a very large amount of coal at one time the engine would choke up and the steam guage would drop. It may be, however, that this difficulty can be overcome by a slight change in the arrester.

During the summer of 1910 the American Spark Arrester company of Indianapolis have been carrying on some extensive tests at Purdue university, and although their success so far is very encouraging, certain details remain to be perfected.

The Chicago & North Western railroad have worked out a head end arrangement which with a little improvement promises great results. The writer lately rode behind an engine equipped with this arrangement which was hauling a time freight and steaming very freely and yet in a fifty-mile run only twenty-two sparks were seen to escape from the stack.

It is a comparatively simple matter to get an arrester that will stop a locomotive from throwing sparks, but very difficult to find one that will also allow the engine to steam freely and pull its load. However, so many railroad companies, and other interested parties are working to solve this problem, and the need for its solution is so great that success seems certain to come in time.

The following address of Mr. R. H. Aishton, Vive-President Chicago & North Western railroad, delivered at the Lake States' Conference at St. Paul, Minn., December 6, 1910, shows the direct financial interest of the railroads in this question.

Interests of Railways in the Protection of Forests.

I have been asked to prepare a paper on the interests of the railways in protecting forests. First, let us consider what are the interests of the railways in these three states represented in the conference, and through which these railways pass. In Minnesota there are, approximately, 33,400,000 acres of forest area; in Wisconsin, approximately, 20,300,000 acres of forest area, and in Michigan, approximately, 24,300,000, making a total in the three great states of 78,000,000 acres of forest that we are here to try to protect.

In Minnesota, located within the forest area alone, there are

2,000 miles of railway; in Wisconsin there are 2,300 miles, and in Michigan there are 3,200 miles, or in the three great states 7,500 miles, lying wholly within the forest area, and this does not include logging roads, double tracks, sidings, spurs or anything but main tracks.

In the operation of these railways, and used exclusively within this forested area, there are, in the state of Minnesota, in regular service, 350 locomotives; in Wisconsin, 450, and in Michigan, 530, or an approximate total of 1,330, employed regularly, and this does not take into account extra locomotives required for relief, shopping, or to meet emergencies or exigencies in business; and it is safe to say that to perform the service in the forested area in these states there are employed each year—at some period of the year or other—approximately 1,800 locomotives.

The magnitude of the traffic through these districts can probably be best indicated by the statements that in the forest area of Minnesota there are moving daily 126 passenger trains; in Wisconsin, 240, and in Michigan 230, or a total of 596 passenger trains daily moving through some part or other of this forest area.

There are also operated daily through this forest area, in Minnesota, 250 freight trains; in Wisconsin, 340, and in Michigan, 350, or a total of 940 freight trains daily, all of which move through this forest district.

Railroads as Consumers.

It is hardly necessary for me to call your attention to the fact that the railways are, and will be for years to come, the greatest single consumers of the products of this timber country, and furnish a ready market for the settlers, lumbermen, and for other interests, and they realize fully, I think, the benefits accruing to them through conservation of the remaining forest areas in these states lying right at their doors, and they also realize fully that for every dollar they pay for piling, posts, lumber or ties throughout this district a certain portion of it comes back to them necessarily through the cleaning up and cultivation of the country; the bringing in of an additional number of people who are capable of earning a livelihood, and for whom they must transport the necessaries of life, and to whom they must look for their support.

From another standpoint: Minnesota, northern Wisconsin and Michigan forest country is today the most attractive fishing,

hunting and summer resort territory left in this great country of ours and is tributary to the greatest centers of population in the country with the single exception of the Atlantic seaboard. The railways, more than anybody else, appreciate the possibilities of the proper conservation, care and development of these areas, and that where they now carry people by the hundreds to these resorts they will soon be carrying them by the thousands with resulting benefit both to themselves and to the communities residing within these districts.

Agricultural Interests.

We have heard a great deal lately about the cost of living. With the wiping out of the tie, post and lumber supply through this northern lumber country, the effect on the maintenance cost to the railways, about which we have heard so much in the rate hearings lately, would be particularly disastrous.

We all remember the day when the northern limit of agriculture was about at Green Bay, Wis. Today we find, bordering the lakes, successful agriculture carried on right up to and beyond Lake Superior, and where formerly the forest held sway we find today prosperous and contented settlers improving the land, raising crops and sustaining not only themselves but the large communities incident to that territory. Had this territory been deforested through fires, the ability to get settlers to go in there would have been limited as, in a great many cases, even the soil itself is destroyed or rendered unfertile through fires passing over it, and the ability therefore to develop agriculturally is gone.

The question now occurs, what, with all their varied interests in the prevention of forest fires, have the railways done to prevent them? I know what the general practice has been.

First. Maintenance of a clean right of way, free from brush, stumps and rubbish.

Second. Co-operation with the fire wardens in keeping the right of way thoroughly cleaned up and burned off.

Third. Absolutely prohibiting the setting of fires by sectionmen, or other employees, except during the winter months or under the direction or order of the fire warden.

Fourth. Installation of the very best and most approved netting in the front ends of locomotives, and constant investigation and experimenting into every new appliance that promises any

relief from fire. In connection with this a very thorough system of inspection at terminals and record of the condition of netting, and arrangements for repairs of same when defective.

Fifth. During particularly dry periods the abandonment of freight service during daylight hours.

Sixth. When dry conditions prevail the establishment of patrol either behind trains moving through the district, or at points in close proximity to each other, to guard against fires starting on the right of way and all times maintaining section patrols.

Seventh. By instructing train crews and engine crews on the importance of avoiding every possibility of setting fires, and directing them when fire is found on the right of way, to stop their trains wherever practical and put it out. Or in cases where their own, or any other train, would be endangered by such steps, by leaving word with the first agent or section crew and having them start back all the help possible to put out the fire.

What further can the railways do, I am very frank to say that I do not know.

They believe that the protection of the forests now conserves the revenues of the railways in the future, and to many of the railways it means their future life and prosperity.

They believe that the protection of the forests may be bettered by more efficient control by the officers of the states over all the interests engaged in business in the timber areas.

They believe in taxation that will enable a well-trained and efficient force to be organized and maintained in each state, and endowed with police powers, for the protection of the forests.

They believe the interests are so great and so identical that settlers, lumbermen, manufacturers and railways, and every other interest should unite in a plan to which all can work, which would be harmful to no interest but beneficial to all.

FIRE AND THE YOUNG FOREST.

It is a self evident fact that if any state expects to have forests in the future, it must see to it that the young forests of today are not destroyed, and yet it seems difficult to make the people of Wisconsin appreciate this very simple truth. One reason is that people have naturally felt that much of the cut-over land that was covered with young timber was suitable for farms, and as this was the best possible use for it, that it made no particular difference whether the young timber was burned this year or cleared off a few years later in making the farms. Such reasoning would be perfectly sound if all the cut-over lands were suitable for agriculture, and while on the whole most of them unquestionably are, still the aggregate of the lands that are too rocky or sandy to be fit for agriculture, is very large and it is a serious loss to the whole state, which it will take many years to repair, to permit the destruction of forests upon such lands.

This emphasizes the urgent need of completing the soil survey in northern Wisconsin as soon as possible, and the necessity for this is explained more fully under "Urgent Necessity for Completing the Soil Survey."

The best economic development of the state demands that each acre of land should be put to its truest use and neither the state nor the individual should keep forests on lands that are better suited for growing agricultural crops. The very existence of our wood-using industries depends upon the protection of our young, growing forests and there is no question but that Wisconsin will lose nearly all of its wood-using industries within the next twenty-five years unless the present destruction of our forests by fire is stopped. Such a statement will probably be challenged as exaggerated, but it is based upon a recent investigation of the forest resources of northern Wisconsin and the destruction of young growth by fire.

We are all more or les familiar with the plight of many towns and even cities, when suddenly the lumber industry, on which they largely depended, has come to an end. Many of these towns have established new industries and after a brave fight are slowly recovering, but the blow was a hard one and the results are more or less lasting.

The effect upon the state of losing its wood-using industries will be the same, but the calamity will be much more widespread

and will be felt much longer. Wisconsin is pre-eminently a lumber state and its magnificent network of rivers, with some 1,000,000 horse power in water powers which are well distributed, make it one of the most favored states for the manufacture of the raw products of the forests.

A forester is trained to a full appreciation of the value of young timber, for he is early taught the cost of growing timber and how long it requires to reach saw log size. On the other hand a person who has not studied the subject is apt to feel that a fire on cut-over land has done little if any real and lasting damage, as he reasons that there was no merchantable timber to be destroyed. The real situation is that the young growth that is left after the logging operations consists in most cases of a considerable proportion of valuable species which if protected would form as valuable a forest as that cut.

Instead of being protected it is burned over and on the burned ground there grows up popple and bird cherry with possibly some white birch, all three being very inferior species with almost no present market value and generally considered mere fire weeds. The direct result of the fire then is that a valuable young growth is replaced by almost worthless species, which it will cost a great deal to destroy and replace by planting.

Then too, looking only at the immediate financial loss, we find that upon the average the young growth that is left upon the land after logging operations is worth about $15 per acre. That is, it would cost that much to plant as many trees of the same kind and pay interest and taxes until they reached the same size. This puts the matter in a different light and it is safe to say that when stumpage is worth what it should be, namely, the cost of growing the timber, there will not be any indifference on the part of the owner to the destruction of his young forests.

Another point is that young timber when burned is soon blown over and forms a mass of inflammable material, which must be burned at very considerable expense if the land is to be planted, and the repeated burnings destroy most of the humus and thus the natural fertility in the soil.

It cannot be stated too often that although merchantable timber when burned can frequently be cut and thus a large part of the value saved, young growth that is burned over is almost always a total loss and the reclamation of such lands costs large sums. Also a surface fire in merchantable timber may scorch the trees and yet not kill them, but young timber is very sensitive to fire and even the slightest surface fire usually means their destruction.

LOPPING TOPS IN LUMBERING.

This is a protective measure the same as piling and burning slash, the object in both cases being to destroy a large amount of inflammable material as soon as possible. The following article in regard to the compulsory "lopping law" in New York state is taken from the American Lumberman of October 8, 1910:

Lopping Branches in Lumbering Operations.

Under this title in the fifteenth annual report of the New York Forest, Fish and Game Commission, Forester John W. Stephen makes an exceedingly interesting review of the first year's working of the New York statute which requires that the limbs and branches shall be lopped in all lumbering operations in coniferous timber in the forest preserve counties. The law reads:

> Every person who shall, within the forest preserve counties of the state, cut or cause to be cut, or allow to be cut any coniferous trees for sale or other purposes, shall cut off or lop or cause to be cut off or lopped from the said trees, at the time of cutting the said trees, all the limbs or branches thereof, unless the said trees be cut for sale and use with the branches thereon. Any person violating the provisions of this section shall be guilty of a misdemeanor and shall, upon conviction, be fined not more than twenty-five dollars or shall be imprisoned for not more than thirty days, or both, for each offence, and in addition thereto shall be liable to a penalty of two dollars for each and every coniferous tree felled from which he shall neglect to cut or lop off the branches.

This regulation is one of the protective measures adopted by the state for the safety of the timber in the forest preserve. No timber is cut on the preserve, consequently the regulation applies entirely to lumbering operations on private lands in the forest preserve counties.

A year is insufficient fully to determine the effectiveness of any regulation, but according to the report of Forester Stephen, who has carefully examined the results of lopping operations, the new law has so far been very satisfactory, as regards both cost and

efficiency. The requirement that the branches of coniferous timber shall be lopped is based upon the assumption that if through lopping the unused upper part of the tree and the branches are brought in close contact with the ground they soon will decay and cease to become a serious fire menace, also that the decaying tops and branches protect young seedlings, increase the humus in the soil and add to soil fertility. Observation shows that under New York conditions this assumption is well founded. Ten years ago a spruce lumbering operation was carried on at Nehasane park. The tops were cut to a 10-inch diameter limit and the branches were lopped to reduce fire danger. Wherever the lopping was done thoroughly the tops have almost entirely disappeared and little material is left that will burn. On the other hand, wherever a top was not lopped it still remains supported above the ground by dry, hard branches and will be a source of fire danger for many years. The illustrations which accompany the report bring out these two conditions in most striking fashion.

Contrary to expectations the cost of lopping the branches, as required by the recent law, is not heavy. It is said that 3 cents a standard and 10 cents a cord of pulpwood is average cost under ordinary circumstances, if the lopping is done to the best advantage. In a number of cases lopping has resulted in actual gain to the lumbermen. Where branches are lopped, skidding and road making are facilitated greatly. Lopping also leads to closer utilization of timber, especially when pulpwood is taken out. One operator reports that through the decreased labor required in skidding, and the occasional logs saved, he believes that the actual cost of lopping does not exceed 5 cents a thousand feet of timber. Another operator who cut spruce saw logs did still better. The report says:

> He left the lopping until after the logs were removed and then went through lopping the branches and taking the timber out of the tops for pulpwood. In this operation, with a force of eight men and a horse employed six days, ninety-seven cords of pulpwood were obtained that would bring him $7 a cord delivered at the mill. This is an average of two cords a man a day, making a very profitable operation.

The Adirondack patrolmen have found also that fires are much easier to handle in lopped timber, because such fires are closer to the ground and men can get near enough to fight them more effectively.

The present New York law requires that only the branches of coniferous timber shall be lopped, since softwood slash is assumed to be the more dangerous. The indications are, however, that a similar requirement for hardwoods would give good results. Hardwood slash is less durable than softwood slash, and if lopped it would decay in a few years. This is made evident by the condition of the land which has been cut over to obtain wood for the acid plants in New York. These plants take small sized wood so that the remaining slash lies close to the ground and is left in good condition to decay. It is said that three or four years after cutting of acid wood the fire danger is nearly over with. In the cutting of hardwood saw timber there is nearly as much need for lopping the branches as in softwoods.

In conclusion the report sums up the case for lopping branches as follows:

> First—Danger from fire is probably lessened from the first by the form in which the brush is left, easier to clear away and not high in the air where it will throw sparks and start crown fires. At any rate, the lopped brush lying close to the ground rots very much faster than unlopped tops. In a few years it is incorporated with the soil and then ceases to be fuel for fire.
>
> Second—As a rule, it would appear that in the Adirondack forests reproduction is promoted.
>
> Third—In most operations some wood is saved that would otherwise go to waste. In some cases it has far more than paid for the cost of the work.
>
> Fourth—The labor of guttering and skidding is lessened to some extent.
>
> Fifth—It is to be noted that hardwood tops decay much faster than softwoods, also that the closer the utilization of timber the shorter the time required for the debris to disappear. Thus, in the case of hardwood operations for acid or cordwood, the debris left is of such small size and gets down so close to the ground that special fire danger is pretty well over in three or four years.
>
> The results of one year's operation under the present law are such that it certainly should be retained.

The above dispassionate and careful report should be of much value to lumbermen in the lake states at the present time, where

the heavy fire losses of this year and the much greater losses of two years ago have made it evident that thorough going measures of fire prevention and control must be adopted. The burning of pine slash is said to have worked fairly well in Minnesota, but a proposed compulsory burning of hardwood slash in Wisconsin two years ago aroused so much opposition from the lumbermen because of its cost and possible inefficiency that a similar measure is not likely to be proposed again. Timber in the lake states and New York is of much the same character. Moisture conditions are also similar. If lopping the branches proves to be a cheap and effective aid to forest fire control in New York the same method should be given a thorough trial in Michigan, Wisconsin and Minnesota.

In reference to the above article it should be said that the burning of pine slash upon the National forest in Minnesota and the Indian reservations in both Minnesota and Wisconsin has worked extremely well and the cost upon the average has not exceeded twenty-five cents per thousand feet of logs cut. The Forest Service, also, compels the piling and burning of slash upon most of the National forests in the west and it has proved a most effective method of forest protection. Pine slash can easily, and should nearly always, be burned as the cutting proceeds, the smaller limbs and all branches simply being thrown on the fire. If the forest is mixed pine and hardwoods, the pine slash makes a very hot fire and the smaller hardwood limbs and branches will be readily consumed, but if the forest is only hardwood, and material to start hot fires is lacking, the hardwood brush must be piled and left to dry out before it can be burned.

Many lumbermen have a mistaken idea and think that the foresters wish to compel them by law to burn all that portion of the tree that is left in the woods. This is not true as it is not at all necessary in most cases to burn the big trunk or bole of the tree that is left in the top, but merely the smaller limbs and branches, which are highly inflammable when thoroughly dry.

The lumbermen of the Lake states are opposed to any general slash burning law but are willing to allow state commissions to say when and where slash is so dangerous that it becomes a public menace and must be destroyed. Lumbermen in order to protect their property, especially the young timber on their cut-over lands, and the property of others, should either burn their slash or lop it so that it will decay rapidly, for when forest fires get started in a heavy slash an army of men is almost powerless.

APPRAISAL AND CLASSIFICATION OF FOREST RESERVE LANDS TO BE SOLD.

Chapter 264, Laws 1905, which is the present forestry law, provides that all state lands north of town 33 shall constitute the forest reserve, but that scattering and agricultural lands may be sold and that the proceeds of such sales shall go into the "Forest Reserve Fund" and that this fund shall be used to purchase lands to add to the forest reserve, and for their improvement and protection. The object of the law was to dispose of the agricultural lands so that farms could be made, to sell the small tracts of isolated lands, which were badly scattered through seventeen of the northern counties, and to use the proceeds to purchase lands suitable for forestry, mainly in Oneida, Vilas and Iron counties, so as to block up the reserves in that section and thus make forestry management possible. This law is a most excellent one and without direct appropriations from the treasury has given the State Board of Forestry funds with which to start the work of building up an adequate forest reserve.

The old appraisals of state lands in many cases were found upon examination in the field to be so inaccurate, and the old prices both for land and timber were often so low as compared with prevailing prices that it was absolutely necessary to have all the lands that it was intended to sell examined and appraised by cruisers. It has taken a long time and hard work to examine and appraise all the lands to be sold, but the resulting increases in appraisals and closer classification has proved that this work had to be done and that the expense was amply justified.

The cruisers reports are very complete and are on each forty separately, showing the amount of timber of each kind, and its stumpage value, the character of the land, whether rolling, hilly or flat, and if stony; the soil is shown as loam, clay, sand or more definitely described if necessary; if swampy, whether it can be drained, also character and amount of young growth. If the description is a lot and adjoins a river or lake, this is of course shown on the plat and if the cruiser finds that there has been any

fire or timber trespass, the amount of the timber thus lost or destroyed is scaled and full notes made so that the trespass can be collected or burned timber sold.

During 1910 all the state lands within the following counties were offered for sale:

Ashland
Bayfield
Burnett
Florence
Langlade
Lincoln
Polk
Price
Rusk
Sawyer
Washburn

Also, all the lands in Douglas county were offered for sale, except those along the Brule river where the state has a small forest reserve, and in Price and Iron counties all except those within the main forest reserve area. None of the lands in Forest, Oneida or Vilas counties are for sale. The state lands that are for sale have now been examined and appraised in all the counties except Marinette and it is expected that this work will be done during the summer of 1911.

LANDS THAT ARE FOR SALE.

As is fully explained elsewhere in this report, the State Board of Forestry is authorized to sell the scattering and agricultural lands noth of town 33, the proceeds of such sales to be used in extending the area of the permanent forest reserves and in their protection and improvement. All of the lands that it proved advisable to sell, with the exception of some tracts in Marinette county, have been examined, appraised and offered for sale at public auction, as provided by law, and those that remain can now be purchased through the State Land Office at Madison. The following table shows approximately the amount of land on the market north of town 33, that remained unsold on January 1, 1911:

County	Acres.	Langlade	2,300
Ashland	5,377	Lincoln	2,463
Bayfield	3,183	Polk	1,961
Burnett	19,012	Price	19,112
Douglas	2,645	Rusk	2,643
Florence	3,563	Sawyer	13,450
Iron	2,280	Washburn	9,009

Many of the above lands are suitable for agriculture and in fixing the appraisal of each forty, the value of the land and of the timber was figured separately. Those who are desirous of purchasing lands in any of these counties can secure lists showing the appraised value of each forty of state land, and a detailed statement showing the character of the land and the amount of timber of each kind can be supplied for any specified description.

Each forty has been carefully cruised, proper deductions being made for any timber that has been cut or damaged by fire and it it felt that the appraisals are fair and reasonable. Under the law the full amount of the appraisal must be paid at the time of sale, and 50 cents should be added to cover the cost of the patent fee, for each section in which one or more descriptions are purchased. Requests for information in regard to these lands should be addressed to the State Board of Forestry, Madison, Wis.

LANDS PURCHASED AND SOLD.

	Acreage Jan. 1, 1909.	Acreage Sold.	Acreage Purchased.	Acreage Reverted to State.	Acreage Jan. 1, 1911.
Ashland	6,258.97	935.92	.....	78.15	5,401.20
Bayfield	5,543.32	2,382.11	.....	.....	3,161.21
Burnett	21,566.75	2,612.79	.....	120.	19,073.96
Douglas	9,995.66	520.	.....	.....	9,475.66
Florence	3,802.86	243.70	.....	.....	3,559.16
Forest	35,427.34	.....	.....	.....	35,427.34
Iron	29,575.34	2,794.97	3,119.69	.....	29,910.06
Langlade	2,740.29	440.89	.....	.....	2,299.40
Lincoln	4,742.21	2,265.35	.....	1.	2,477.86
Marinette	4,534.21	40.	.....	.....	4,494.21
Oneida	53,030.63	.....	280.	.....	53,310.63
Polk	2,120.74	160.	.....	.....	1,960.74
Price	29,450.12	2,042.02	.....	66.35	27,474.45
Rusk	3,362.87	468.40	.....	.....	2,894.47
Sawyer	14,209.65	650.51	.....	.....	13,559.14
Vilas	36,171.36	.....	23,784.69	.....	59,956.05
Washburn	12,051.77	3,063.47	.....	.....	8,988.30
Total	274,603.09	18,620.13	27,184.38	265.50	283,423.84

Note.—The above table does not include the state lands within the Indian Reservations.

TIMBER TRESPASS.

The government and state practically encouraged timber trespass upon public lands for so many years by allowing trespassers to settle by simply paying the value of the timber taken, that it has been very difficult to stop the practice at once and to make such people understand that illegal cutting of timber is nothing more nor less than common stealing.

In 1905 the law was strengthened so that the civil liability for forest trespass is now double the amount of damages suffered and under criminal action the fine is not less than $25, nor more than $1,000, or imprisonment not less than fifteen days nor more than three years, or both fine and imprisonment. The result of this law has been to largely put a stop to all forms of trespass upon state lands, as it does not pay to cut timber illegally when one is obliged to pay double the value of the timber taken, plus all the costs of examination and survey.

Public opinion in northern Wisconsin, however, has not yet been educated to support a jail sentence for a trespasser, unless in the case of an old offender and when the trespass has been glaringly flagrant and willful. This is especially true in the case of a poor man with a family, as the jury seems to reason that if the man is sent to jail, his family will become a charge upon the county or town. After years of "rubber forties" and practical encouragement, the law cannot suddenly be made too drastic and still meet with public support.

However, the double stumpage law has been in operation for over five years, and it is now recommended that it is time to still further strengthen this law. The law of New York state provides a penalty of $10 for every tree cut on state lands but so drastic a law in Wisconsin at the present time would probably defeat its own ends. It is recommended that the civil liability for timber trespass be increased from double to triple the value of the timber taken, plus all the costs of examination and survey. Both the state and private timberland owners have been put to considerable trouble and loss in past years by Christmas tree trespass. Large firms in Chicago, Milwaukee, St. Paul and other

nearby cities make contracts with small jobbers or settlers to furnish a large number of Christmas trees. These contractors have been in the habit of going upon any land where there was a fine growth of young pine and cutting it all off in a few days' time. Many such trespassers are not residents of Wisconsin and they can cut, load and ship these small trees so rapidly that it is very difficult to detect them until the trees have been shipped and then the offenders are outside the jurisdiction of the state. However, timberland owners have dealt with such cases as severely as possible by imposing heavy fines, confiscating the trees cut and also bringing criminal action, so that this business is being largely discouraged and the dealers are compelled to buy the young trees from those who are willing to have them cut. The state has only suffered to a slight extent from such operators, as our lands are watched closely as Christmas approaches and we have been able to detect nearly all such cutting in time. The children and grown-ups need not fear that there will be any shortage of Christmas trees in the future or that foresters will discourage this old custom.

Upon lands that are protected from fire thousands of young pines will come up to the acre, and if left to themselves to follow out nature's law there will be a fierce struggle for existence, so that only a small percentage will survive. These will be the strongest and best developed but by far the greater number will gradually die and fall to the ground. Even the strongest young trees that survive are checked in their growth during the years of their fiercest struggle for existence and the forester can aid nature by cutting out the less promising trees and thereby allowing the stronger to shoot ahead free from the struggle.

Such cuttings are called "improvement thinnings" and are an important part of forestry work in all foreign countries where there is a ready market for the young trees that are thinned out.

In this country the forester as a rule has not been able to make improvement thinnings as there has been no market for such young trees, but the demand for Christmas trees promises to furnish the market to a considerable extent and therefore the forester hopes that more Christmas trees will be used and not less. However, he wants such young trees cut out under a system that will hasten the rate of growth and improve the future forest and does not want to have every tree cut by a person who is politely called a trespasser while in fact he is nothing less than a common thief.

TIMBER SALES.

The very severe and widespread forest fires of 1908 and 1910 killed a considerable amount of timber upon the scattering forest reserve lands, especially in the western part of the state. It has been impossible to protect all the forest reserve lands, as they comprise approximately 340,000 acres, and are scattered through 17 counties. Such losses will continue until the forest patrol system is established and the main reserves are blocked up and protected by means of fire lines, roads, trails, telephones, etc., and a well organized force of forest rangers. The burned timber is advertised for sale in the local papers, to the highest bidder shortly after the fires have occurred and the tracts have been looked over by one of our cruisers.

Frequently the timber is thus sold at once, but sometimes the bids are too low to be considered and the timber must be held until a favorable bid is received. Nearly all of the burned timber has been disposed of but some of it is so remote that no sales can be made and in such cases the timber will probably be a total loss.

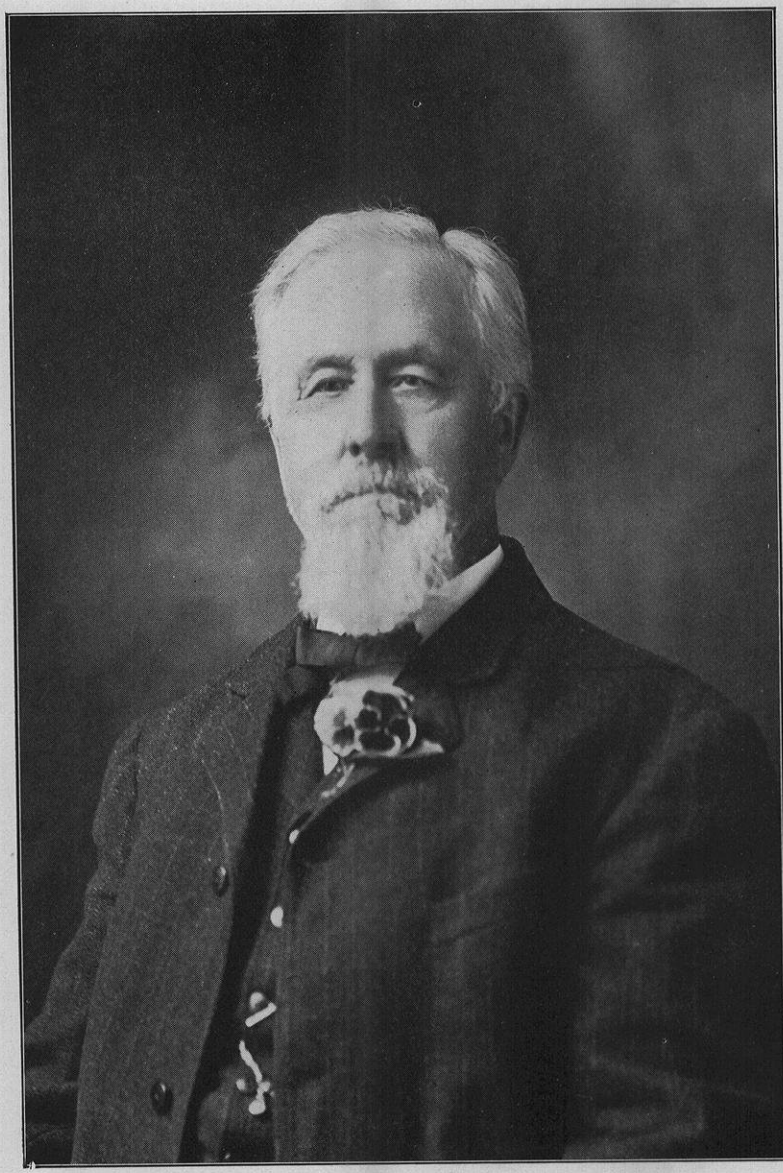
This brings up a point that many of the lumber journals of the country seem to overlook. They frequently state in mentioning fires in various parts of the country that the loss in timber will be practically nothing, as the lumbermen will cut the timber and thus save it. True the lumber company owning a fairly solid body of timber, with a railroad to promptly haul the burned timber and a mill to cut it, can save much, although fires nearly always increase the cost of operation, and the fires of 1908 and 1910 have thrown a lot of lumber on a market that was already rather sick from overproduction.

But what of the scattered forties that the lumber companies own and the thousands of small tracts of from 40 acres to 600 acres, owned by settlers or men in the various cities and towns? Such owners, and their holdings are very large in the aggregate, are nearly always non-operators, and if they are fortunate enough to sell their burned timber at all, it is always at a big discount

from stumpage prices for green timber, and hence at a great loss, and much of such timber cannot be sold before it spoils and so is a total loss.

This greatly mistaken idea of some people that all burned timber is cut and saved is mentioned because such articles appearing in the lumber journals lead the general public, who are not posted in the matter, to naturally feel that the agitation in regard to the fearful economic losses from forest fires is all bosh and buncombe if the timber is cut and saved, and that there is no loss.

The apparently stoical indifference of the American people as a whole to forest fires is a blot on our civilization and to tell them there is no loss is a strange way to bring about reform and gain their active assistance in the hard work that must be done to stop the fearful destruction of our forests by fire.



William Toole, Baraboo, President W. S. H. S.

ANNUAL REPORT

OF THE

Wisconsin State Horticultural Society

For the Year 1910

VOLUME XL

PART II.

(Part I, containing Constitution, By-Laws, Business Transactions, etc., distributed to members only.)

F. CRANEFIELD, Editor

MADISON, WIS.

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1910

LETTER OF TRANSMITTAL.

MADISON, WIS., February 1, 1910.

To His Excellency, JAMES O. DAVIDSON,

Governor of Wisconsin.

DEAR SIR:—I have the honor to transmit to you herewith the Fortieth Annual Report of the Wisconsin State Horticultural Society.

Respectfully,

FREDERIC CRANEFIELD,

Secretary.

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OFFICERS AND COMMITTEES, 1910.

OFFICERS.

Wm. Toole, President.....Baraboo
A. J. Smith, Vice-President.....Lake Geneva
L. G. Kellogg, Treasurer.....Ripon
F. Cranefield, Secretary.....Madison

EXECUTIVE COMMITTEE

Wm. Toole, Chairman.....Ex-Officio
A. J. Smith.....Ex-Officio
L. G. Kellogg.....Ex-Officio
F. Cranefield.....Ex-Officio
1st Dist., Wm. Longland.....Lake Geneva
2nd Dist., G. W. Reigle.....Madison
3rd Dist., L. H. Palmer.....Baraboo
4th Dist., F. W. Harland.....Milwaukee
5th Dist., H. C. Melcher.....Oconomowoc
6th Dist., E. Gonzenbach.....Sheboygan
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., Harvey Nourse.....Bayfield

BOARD OF MANAGERS.

Wm. Toole. L. G. Kellogg. F. Cranefield.

COMMITTEE ON TRIAL ORCHARDS.

J. S. Palmer, term expires.....1913
R. J. Coe, term expires.....1912
L. G. Kellogg, term expires.....1911

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 1906
Barron, Barron County, 5 acres.....Established 1906
Manitowoc, Manitowoc County, 5 acres.....Established 1907
Gays Mills, Crawford County, 6 acres, (1 A. Grapes)..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

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 extensive 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, Fallwater, 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. Perfection.**
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
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 Cinque 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 Pallassi Desv. (Tamarix Amurense Hort.)	Amur. Tamarix
Viburnum Opulus vr. sterile	Snowball

* From Bulletin 108, Wisconsin Experiment Station, by F. Cranefield.

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 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
Sambuscus Canadensis.....Common Elder
Sambucus Canadensis.....Common Elder
Sambucus pubens.....Scarlet Elder
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 yeaar 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.

POISONS USED TO DESTROY INSECTS IN ORCHARDS AND GARDENS.

PARIS GREEN

A well know poison used to destroy biting insects, as the apple worm, tent caterpillar, potato bettle, etc.

Formula

Paris Green	1 to 2 lbs.
Fresh (unslaked) lime	1 lb.
Water	200 gals.

One-half pound of pure Paris Green to 50 gallons of water is sufficient to destroy codling moth and other insects in the orchard and fruit plantation if properly applied.

Add ½ lb. Paris Green to every barrel of Bordeaux mixture and make a complete spray.

ARSENATE OF LEAD.

(A Poison for Biting Insects.)

This poison is better than Paris Green for the following reasons:

(1) It remains longer in suspension.

(2) It adheres better to the foliage; one thorough application being sufficient for the entire season.

(3) It may be used in any reasonable quantity without danger of injury to the foliage.

Use at the rate of 2 to 3 lbs. to 50 gals. of water or Bordeaux.

Add 2½ lbs. of Arsenate of Lead to every barrel of Bordeaux mixture and make a complete spray.

WHITE HELLEBORE.

(For Biting Insects.)

Used to destroy currant and cabbage worms and on fruits and vegetables where more poisonous substances cannot be used with safety.

Formula

Powdered white hellebore	1 oz.
Water	2 to 3 gals.

It may also be used in the powder form mixed with flour, gypsum, soot, etc.

BORDEAUX MIXTURE.

The Unviersal Fungicide. Not a cure but a preventive of fungous diseases.

Formula.

Copper Sulfate	4 lbs.
Fresh (unslaked) lime	5 lbs.
Water	50 gals.

Dissolve the copper sulfate in 25 gals. of water in one barrel or cask.

Slake the lime so as to make a paste which dilute to 25 gals. in another barrel.

The lime water should be strained to remove coarse particles which clog the nozzles in spraying.

Pour these two solutions together into a third barrel and the resultant mixture is Bordeaux.

Add 2 to 3 lbs. of Arsenate of Lead to every barrel and make a complete spray.

Caution: Use only wood, copper, earthware or glass vessels in making Bordeaux.

Stock Solution for Bordeaux.

The above formula and directions may be followed when only small quantities are used. When ten barrels or more are used at one application always employ stock solutions.

For example: Dissolve 100 lbs. sulfate in 50 gals. water.

Slake 100 lbs. of lime and dilute to 50 gals.

Then use the following formula:

Water (approximately)	45 gals.
Sulfate Solution	2 gals.
Lime Solution	2½ gals.

LIME-SULPHUR COMPOUND.

Home Made.

(From Bulletin 16, W. S. H. S.)

Formula.

Fresh (unslaked) lime	15 lbs.
Flowers of Sulphur	15 lbs.
Water	50 gallons.

Directions for Preparation. In a kettle of at least forty gallons capacity heat twelve gallons of water. In a separate vessel mix fifteen pounds of sulphur with water enough to make a thin paste. Pour the paste into the heated water and when the mixture is near the boiling point add fifteen pounds of lime. After the lime has completely slaked, boil for one hour, stirring to prevent caking on the sides of the kettle. Then strain into the spray tank (or barrel) and add sufficient water to make fifty gallons of the mixture.

Lime-sulphur wash diluted as above is used only on dormant plants. Where large quantities are used a steam cooking plant is almost a necessity.

SELF-BOILED LIME AND SULPHUR.

(Bulletin 213, N. J. Agr. Exp. Sta., Sept., 1908).

"In this combination only the heat of the slaking lime is relied upon to unite it with the sulphur, and the formula is:

Lime, best quality	40 pounds.
Sulphur—flowers	20 pounds.
Water	50 gallons.

Place the lime in a barrel and dust in the sulphur with it, so that the two may be well mingled. Add boiling water enough to start a brisk slaking, and cover with a heavy blanket to confine the heat. Add hot water as needed to keep up the slaking and stir occasionally to aid the combination. Keep this up until the lime is fully reduced and mixed with the sulphur. Then let the combination stand covered for an hour to maintain its heat; afterward dilute with warm water to the desired strength and spray at once.

It should be remembered, in making all these mixtures, that enough heat is needed to melt the sulphur and bring it into combination with the slaking lime. It matters little whether the heat comes from a fire or from slaking lime or from caustic soda. For the mixtures made without fire, the water used in slaking should be boiling hot. If cold water is used the heat of the slaking lime is used up in heating the water, and not enough remains to combine the sulphur. It is only the sulphur in combination with the lime that acts as a scale-killer. The uncombined sulphur helps nothing and the surplus lime is a positive drawback, since it makes the wash too thick to penetrate well."

COMMERCIAL LIME SULPHUR.

Concentrated Lime Sulphur compound is offered by several different firms.

The commercial product is a clear reddish liquid and is used by diluting with cold water.

LET US (S)PRAY

WHAT?	WHY?	HOW?	WHEN?		3D SPRAYING	REMARKS
			1ST SPRAYING	2D SPRAYING		
Apple	Scab	Bordeaux Mixture	Just before Blossoms Open	Just after Blossoms Drop	10 days after 2d Spraying	
	Codling Moth	Arsenate of Lead combined with Bordeaux	Just after Blossoms Drop	10 days later	Last week of July or 1st week of August for 2d brood	1st and 2d Spraying same as 2d and 3d for scab; merely add arsenate of lead to Bordeaux
	Oyster Shell Scale	Lime-Sulphur	March or early April but before growth starts			Do not use Lime-sulphur on growing plants
Cherry and Plum	Mildew and Shot-hole fungus	Bordeaux Mixture, 3—4—50	When leaves are about ½ grown	10 to 12 days later	10 to 12 days later	
Currant and Gooseberry	Mildew, blight and Currant worm	Bordeaux and Arsenate of Lead	When leaves are fully developed	2 to 3 weeks later		
Grapes	Mildew and Anthracnose	Bordeaux	Before leaf buds open	2 to 3 weeks later	3rd, 4th and 5th applications at intervals of 2 weeks if required	
Strawberry	Leaf-spot or blight and leaf eating insects	Bordeaux and Arsenate of Lead	When first leaves appear	After Blossoms fall		
Raspberry and Blackberry	Anthracnose and fungous diseases	Bordeaux	As above	2 weeks later		Spray new growth after fruit harvest

AN OUTLINE OF THE WORK OF THE WISCONSIN STATE HORTICULTURAL SOCIETY

The Wisconsin State Horticultural Society conducts field work at sixteen different points as indicated on the map.

The work was begun in 1897 at Wausau for the purpose of testing the hardiness and adaptability of the different varieties of tree fruits in the northern or "cut-over" regions of the state.

These orchards comprise 55 acres and 5445 trees in addition to two acres of grapes.

The orchards at Wausau, Medford, Barron, Poplar and Maple are "Trial" Orchards, being for the purpose above indicated; the Sparta vineyard is also in this class.

The remaining orchards are located in sections where tree fruits are known to thrive and are designed as "Model" or demonstration orchards to show the best methods of culture, best varieties for market, etc.

An account is opened with each of the "Model" orchards with the confident expectation that a decided margin of profit will be shown at the end of 10 or 12 years. The orchards should then yield profitable crops for 20 years longer with but moderate expense for maintenance.

In these two ways the Society hopes to demonstrate the possibilities of fruit growing in Wisconsin.

The Society has recently (1909) undertaken the task of improving the grounds of the 7,000 rural schools of the state. (See 1909 Arbor Day Annual, p. 41.) A comprehensive plan has been adopted and the first steps taken.

Additional Aims and Purposes of the Wisconsin State Horticultural Society

Organized in 1865, being the legitimate successor of the Western Fruit Growers' Association, which was organized in 1853.

Chartered by the State of Wisconsin in 1871.

Purely an educational institution.

Its purpose the advancement of every branch of horticulture throughout the state.

Aims to accomplish this through publications, individual help and Conventions (two yearly).

Issues an annual report (250 pages) containing articles by experts on orchard culture, small fruit and vegetable gardening and the decoration of home grounds. Sent free to members.

Issues bulletins on practical subjects written in plain language and free from technical terms including pruning, spraying, planting, etc. Sent free to members and others who apply.

WE ANSWER QUESTIONS

Individual help is furnished through the Secretary, who obtains from reliable sources information on any horticultural topic. No charges for such services,

Receives an annual appropriation from the state for the support of the field work and other activities.

Maintains a membership of 158 life members and over 1,000 annual members. (Feb., 1910.)

Extends an urgent invitation, a promise of help and the hand of fellowship to all who want to learn about the growing of fruit, flowers or vegetables; to all who love the beautiful in nature a hearty welcome is assured.

Cordially invites every person in Wisconsin who knows something about fruit, flowers or vegetables to become a member, as such persons are needed to help along the splendid work in which the Society is engaged.

WM. TOOLE,
President W. S. H. S.,
Baraboo.

FREDERIC CRANEFIELD,
Secretary W. S. H. S.,
Madison.

Annual membership 50c. **Life Membership $5.00**

Remit to Secretary, Madison, Wis.

TRANSACTIONS

OF THE

Wisconsin State Horticultural Society

SUMMER MEETING.

La Crosse, Wis., August 25, 1909.

MORNING SESSION.

The meeting was called to order by the President, Mr. William A. Toole, at 10 o'clock, in the Court House.

After the invocation by Mr. Irving Smith, the president announced the first subject on the program, "The Orchard, Location, Varieties, etc." and called on Dr. Loope to speak on the subject of "Apples."

Dr. Loope: In regard to the location of the home orchard, there are a great many homes in the state of Wisconsin that have no location that would be of any use for a home orchard. The location ought to be one reasonably high and well drained; never anything else.

In regard to varieties, that is where we differ; here is where our roads will part right away. In the home orchard there is one tree that you absolutely must not plant, and one apple that must not be in the home orchard, the apple of discord, because it will bear something that will make trouble all the time and you cannot take care of it. The apple of discord is entirely discarded in my home orchard. But for fifty trees for the home orchard, I would say, 10 Wealthy, 5 Duchess, 5 Northwestern

Greening, 5 Whitneys, 5 Tetofsky, 5 McMahon, 5 Snow, or Fameuse, 1 Wolf River for shade, I Sweet Crab for the children

Now, you will notice in that list I have no really good winter apple, and in all the lists for your home orchard you had better leave out all the real good winter apples. What I mean by that is, that the regular old fashioned winter varieities, such as are grown in New York and Ontario and Michigan, we cannot raise. There is no use planting them; they will die. There may be favored localities where you can put in that class of fruit in this state, but there are not many of them, and the main part of the home orchard you must devote to the summer and fall apples, and if you do that you can grow all the apples you can use on fifty trees such as I have named. You would not be able to use them all.

The reason I put in the Wealthy is because the Wealthy is one of the best apples grown in Wisconsin or anywhere else. I put in the Wealthy, because, if you are near cold storage, and you have ten or twelve trees, they will fill your barrels with Wealthies, put them in that cold storage and take them out in February, March or April, and you have the finest eating that anybody ever had in an apple. So you can have apples all winter long, if you are near cold storage.

As regards culture; it is quite a mooted question. I have been to quite a number of horticultural meetings, in Missouri, Illinois and other states, and I find just as much diversity of opinion there as there would be here today, probably. The fad that they have just now is clean culture; it is a very fine fad; if you are going to have the very finest ideal for an orchard, you have got to keep it clean, free of sod, without anything green between the trees, because that is the ideal condition.

The question of culture in the home orchard is quite a burning question, because we know and you know and every one knows that the home orchard is the neglected place on the farm. If there are any Canada thistles, quack grass, or any of those things to be grown on the farm, they are grown in the home orchard. The trees are neglected, they are not pruned, and once in a while a tree will die under such use, and they will come around and say, "Why, we cannot raise apples here, the trees die." I have quite a large orchard of some five thousand trees, and I find in that orchard the trees die, but before this I have made this state-

ment, that in the community in which you live some of your neighbors die, and sometimes you cannot tell why they have died, at other times the cause of their death is very plain, and it is the same law that governs both the individual and the orchard, I think.

There are a good many other things in connection with the home orchard. The home orchard will not get spraying; ninety-nine out of every one hundred home orchards, in Wisconsin we will say, are never sprayed. Now, if you are going to educate the people of Wisconsin to the point of having home orchards, you have got to teach them to spray, and we have some gentlemen here who have been at that business this year, I am glad to say, giving demonstrations and working along that line, and I think that ought to be spread all over the state and that lesson ought to be thoroughly given.

In regard to the pruning question, every man has a way of pruning. Of course there are certain general principles in regard to pruning that are established, but when you come to the actual pruning, there are a great many people that have their own notions I have a orchard that I have never pruned, and I have less apples on them, and I am going to put a tree butcher in and clean them out bye-and-bye, and I hope to get better fruit, and maybe as much as I have had heretofore, but I believe judicious pruning is a good thing.

A Member: Would you plow an orchard that has been in blue grass sod now, or wait till spring?

Dr. Loope: Not now, wait until spring.

Mr. Hager: I do not agree with the doctor on the grass part and I do not want this society to go on record in favor of grass orchard, because if you do, the tendency is that they will quote this society as saying that grass is all right, and they will seed them down about the second year.

Mr. Periam: As to the question of plowing an orchard, it is self-evident that it would be ruinous to any orchard to plow it just as the orchard is ready to go to rest for the winter, because it generates a second growth.

Mr. Palmer: I practice plowing last thing in the fall, plow as shallow as I can; I never had bad results, and I think I have good results as far as curculio is concerned.

Dr. Loope: Do you have any blue-grass sod?

Mr. Palmer: I do not let any blue grass get in at all.

PEARS FOR WISCONSIN.

GEO. J. KELLOGG.

In 1854 I did not know much about Wisconsin as a fruit state; who did? I had helped my father graft in a little seedling apple nursery in 1840, two and one-half miles north of Kenosha, and had helped harvest nice, large, rare, ripe peaches on his farm. After my return from California in 1853 I bought seedling peaches eight miles west of Racine at $1.00 per bushel. That same year I bought 40 acres on the prairie two miles south of Janesville on which I expected to raise an abundance of fruit; my hopes I think were based on the fact that there were three dead peach trees on the place.

In 1854 I bought 100 apple trees of Colby & Willey grown only one mile from me; 100 apple trees grown by F. K. Phoenix, Delavan, Wis; and 100 apple trees grown by J. Bell, of Springfield, Wis. These were planted 40 by 40 feet covering about 12 acres. I commenced planting every other row pears and plums, making the orchard 40 by 20. Of the apples why not plant eastern varieties, we are on a line west of New York. Who at that time knew any better? Of pears I planted dwarfs and standards any variety I could buy; I had the encouragement of my brother-in-law Dr. Ozanne who had a successful pear orchard seven miles west of Racine. Of plums they were all of European varieties.. The Americans had not come from the woods at that time.

The winters of 1853 and 1854 gave us our first severe Horticultural lesson. My zeal for pears continued and I planted two trees for every one that died; this is a good rule if you have the right soil and good common sense. I did get in ten years a small basket of Louise bon de Jersey, nice pears, from a dwarf. About this time I stated at our Horticultural meetings that pears grown outside the influence of Lake Michigan, in Wisconsin cost $10.00 each. I kept on planting pears in spite of the winters of 1853–4; '62–3; '74–5; and '82–3. During these years I had known Dr. Robinson and F. W. Loudon to grow pears quite successfully on the high ground west of Janesville where the Janesville grape, the Jessie strawberry and the Loudon raspberry had their birthplace; and I had seen in the city of Janesville a half dead Flem-

ish Beauty bear two bushels of nice pears. I had succeeded in growing a row of seedling pears on a high gravel hill that bore some poor fruit and gave quite a success to top grafted Kieffer. I had reduced the cost of pears to $5.00 each in this 45 years of unsuccessful efforts.

After the winter of 1898–9 when the dry freeze killed for me 75,000 apple trees, 2,000 roses, three acres of vineyard and all plum and pear stock I quit growing pears on the prairie. There is one little monument of my pear folly still standing; a Flemish Beauty 30 years old standing south of the carriage house and nearly covered up by an Austrian pine, that does bear a few scrawny, cracked pears.

In 1899 I came to Lake Mills planted Flemish Beauty, B de Anjo, Bartlett, Clapps Favorite and Kieffer; standards on clay soil, about 20 feet above and near Rock Lake, which is 3 miles by 2 including the mill pond. These all died but Bartlett and Kieffer. Bartlett has borne three full crops and no blight; Kieffer has also had to be propped up and then broke down with fruit. The other trees blighted and winter killed before fruiting. John Schultz on the N. W. side of this lake had a successful pear orchard of a dozen varieties and grew bushels and bushels of nice pears for the market.

I had a fearful attack of "pear fever" eight years ago while delegate to Michigan Winter Meeting, as a result I bought a dozen Dwarfs, the Duch. de Angouleme bore one pear that weighed 19 ounces and died. Clapps Favorite, Sheldon, Bartlett, Louise bon de Jersey, and Flemish beauty all died before fruitage. Koonce still lives but no fruit. C. des Nantes has become a half standard and has borne three crops and is now loaded to breaking; this is a very large pear of excellent quality, which I have repeatedly exhibited at the state fair. This year Bordeau, which looks in tree and leaf almost identical with C. des Nantes, is carrying its first crop and is supported on all sides for fear of breaking; this is a pear about the size and shape of the Bartlett.

As vacancies occur in the pear row I set in Kieffer trees to top graft and now have eight Kieffer carrying the following twenty-one varieties, C. des Nantes, Worden, Seckel, Peffers No. 4, No. 5, and Russian Seedling; Rhiels Best; Starratt, of Phil Cheek; B. Clariague; Flemish Beauty; Bartlett; D. de Angouleme; Pres. Druard; Lincoln; Marguerite; L. bon de Jersey; Mt. Vernon and

Burkett; Bordeau; Wilder; Vt. Beauty; and Peffers Seedling No. 6; five varieties in fruit this year, Bartlett; Bordeau; C. des Nantes, Kieffer and Clapp Favorite. Most of the Kieffer are entirely worked over and what surprises me is I have had no blight for five years. One Kieffer is growing twelve kinds that promise fruit next year. I shall have about two bushels of No. 1 pears this year and can now grow pears at one cent each.

I attribute my success to high clay soil, contiguous to the lake, careful cultivation, wrapping the trees in winter with ropes and cat-tail flags or corn stalks, thorough spraying and top grafting on Kieffer. With fifty-five years experience growing pears in Wisconsin I would advise setting on high clay soil with free circulation of air avoiding any fertilizers, planting Kieffer standard to use as a stock to top graft, plant also C. des Nantes, Bordeau, Flemish Beauty and Bartlett, preferably dwarfs; careful cultivation, wrap in winter; thorough spraying and a general pinching back of vigorous shoots.

Mr. President I have thus given my failures and sucesses; believing it will benefit more than any theory I might advance. My 74 years in Wisconsin and 55 years in the nursery business ought to be worth something.

Mr. Hager: I would like to ask if Mr. Kellogg would advocate setting pears in the so-called home orchard for the average farmer?

Mr. Kellogg: If you are on clay soil, try it. Do not spend your last dollar on it. I would not plant on prairie soil unless I wanted to fool away my money; I did that for forty years and got no returns.

Mr. Periam: Mr. Kellogg uses the word "clay," now, what kind of clay was that, whitish or yellow?

Mr. Kellogg: Yellow clay; alluvial clay.

Mr. Periam: That solves the question; it is not blue clay. Pears have no business in blue clay; still the white clay north of Chicago is very fertile in pear culture; they raise a great many in Waukegan, but it is the quality of the clay soil that has helped you out. I may as well say that my friend Kellogg's experience was more serious than that of a Bostonian in relation to pears. Mr. Kellogg says it cost him five dollars apiece, now he has reduced the price very considerably. This Bostonian, they were

making fun of him for growing pears; he said, "Why, gentlemen, pears do not cost me much; I can raise them for about 75 cents or a dollar apiece." I do not think I ever raised pears that cost me less than five dollars.

Mr. Kellogg: I got them this year so that they did not cost me a cent apiece.

CHERRIES AND PLUMS.

By D. E. BINGHAM, Sturgeon Bay.

I have no paper prepared on cherries and plums.

In regard to cherries; about fourteen years ago, when Prof. Goff and Mr. Hatch went to Door county they figured that the European plum business would be a wonderful success, taking the general lay of the land and the nearness to the water into consideration, they thought that plum culture there would be as sure a thing as they could enter into, and planted out about sixteen acres of European plums, with perhaps two or three varieties of the natives and as many of the Japanese varieties. Those trees did very well for a number of years, but the shot-hole fungus, which attacks the foliage of European plums, and of course of the Japs and of the cherry, attacked these, and being in the nursery, we did not have a chance to spray them, and of course that injured the trees somewhat. Following a hard winter, nearly all of the European varieties were dead, the result, no doubt, of the defoliation the previous summer. The Japanese varieties still stood that test, the foliage did not fall as much as on the others, the shot-hole fungus seemed to attack the foliage on the Jap varieties earlier in the season, and they seemed to renew and go on with the later foliage, which was good and did not show as much injury, and consequently lived through the winter. That is about fourteen years ago. The Japs are still living, the Europeans are practically cleaned out, with the exception of perhaps two or three hundred trees on a lower, sandy soil.

This year and last year also the winters were very mild, mild enough so that on the Jap varieties the fruit buds lived through the winter and we had a good crop last year and this year of the Burbank. Europeans have the disadvantage of being a little

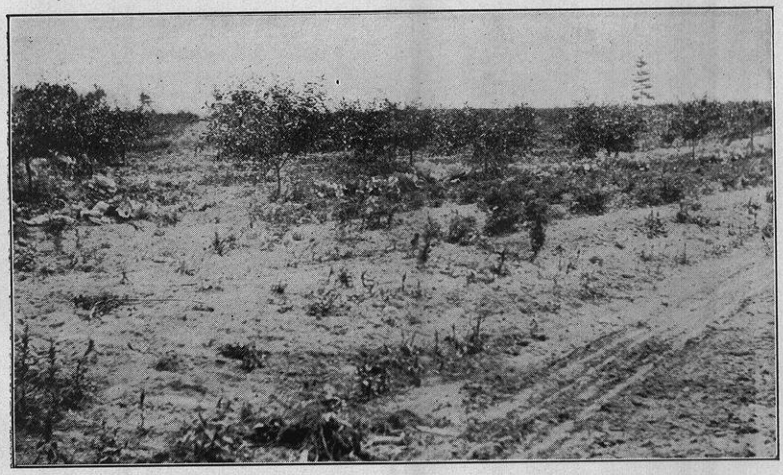
weaker in the tree but are a little stronger in the fruit buds than the Japanese; Burbanks are hardy in the tree, but in the fruit buds are more tender than the Europeans. With us the native plum has never proved successful, until this year. I have a fair crop of Wyant, Forest Garden and Hawkeye. It is the only crop of natives I have of ten years' planting of trees, and they are vigorous and healthy, and with the exception of the extra amount of work that we have put on the pruning of them, they have cost no more than others, but the fruit up to the present time has cost more per basket than either European and Japanese.

Perhaps there would be no necessity of entering into the matter of cherry culture, except we might mention the importance of keeping the trees well topped, and leaving on the first growth that we get, until we get a crop of fruit from that wood.

You understand in planting out a cherry orchard our main object is to get fruit early, get them to bearing as young as possible, get them to pay their way, and we figure closely on the amount of growth that we get each year. Trees this year of six years' planting produced three cases of cherries each.

In regard to the different varieties of plums, one has to consider location and soil and the care one can give a tree in order to make them profitable. I think a crop of Burbank plums one year out of three would be a paying proposition. This year we had trees about fourteen years old that had forty baskets a tree. Those can be planted twenty feet apart; that would make 108 to the acre; that would be equal to a thousand dollars revenue per acre. You might get that crop once in five years in favored localities; even so it is profitable to grow them. We have averaged about one crop in three years right along that has been usually a good crop; we have had a few scattering plums, and a light crop a little oftener than that, say every other year; but last year forty trees on a farm that we had rented gave us about 400 baskets of Burbank. In the vicinity of La Crosse I would not plant anything but the natives. I would plant such varieties as Hammer, Surprise and De Soto. The Wyant with us is a little late, perhaps it might be earlier here, it is too late to make it very profitable, and not very good quality.

The varities of cherries that we grow there are only two, the Early Richmond and Montmorency. We have other varieites coming on well, the Wragg cherry for instance is a good producer; we have trees of this variety that have been planted four-



Cherry trees at Sturgeon Bay, 3 years planted.

Neglected cherry orchard, Sturgeon Bay, 4 years planted. A few scattering trees only remain which proves that something besides climate is needed to make a profitable cherry orchard.

teen years that every year since they were planted have produced cherries, a few specimens the first year and every year since they have produced crops of cherries increasing gradually. There seems to be an imperfection in the foliage that we cannot control by spraying, the new growth seems to be injured by the winter. These trees are practically dwarf, and we pick from the ground. They produce only three cases; a Montmorency of the same age would produce ten cases.

Mr. Reed: I have in Winnebago county an elevation of 150 feet; would you advise me to plant cherries up there?

Mr. Bingham: I do not know; there is something peculiar about the cherry. In Richland county, where cherries seem to do as well as any section of the state that I have visited, I find that they get about two crops of cherries in four years, about every other year a crop, sometimes two crops in five years, and the reason for it does not seem to be frost, it seems to be weather conditions, or climatic conditions that do not favor the fruiting of the cherry. You will notice in all those sections the trees run considerably higher than in our section of the country, or along the lake, showing that there is something in the soil or climate of other sections that is not just suitable to the cherry tree.

You will notice in all the experimental orchards we have the growth of the cherry is high, all the bottom limbs keep dying off early, when the trees are three or four years old you see those limbs die. With us the trees from the ground up are nice, solid, healthy foliage; it is a healthy condition of the tree that keeps those bottom limbs alive, and there is where we get our fruiting wood.

The President: Do you know that in Richland county they practice such thorough spraying as you do at Sturgeon Bay?

Mr. Bingham: I do not know that they spray as thoroughly, but spraying is practiced; they do not cultivate them as thoroughly as we do. One thing about the cherry is very important, and that is, to give it constant and thorough cultivation. I think there is nothing that will injure a cherry tree as much as to put it in sod, even for a season, even if they are large enough to produce fruit. If you check the growth of a cherry tree it turns the bark rather dark, and next year those trees are more apt to be broken off with the wind, you will find the wood more rotten.

Dr. Loope. You have made a success of cherry growing, a great success, the question is, whether the people in other localities in the state of Wisconsin except those favored localities on the lake, can grow those cherries, whether they had better buy fruit than plant them. That is the question that is of interest.

Mr. Bingham: I think cherries can be made to thrive in more sections than those favored sections that you speak of, if the trees were given proper care. Our cherry trees, if we give them cultivation, make good, rapid growth every year, and then the conditions are right to ripen up the wood. Of course, in some sections of the state, on rich soils, the trees do not ripen up the wood as quickly as the cherry ought to do; the cherry ought to be mature by the middle of July, and we find sometimes they get nipped a little by the winter if they are not mature early enough in the season. Oftentimes in institute work a man will ask the question "What is the matter with my cherry trees; they are not healthy, the foliage falls too early, turns yellow and falls off; the tree looks all right until the foliage falls." That is the shot-hole fungus, and the man is not spraying, and there is nothing that will injure a tree more than the foliage falling. In this orchard I spoke of, the man neglected spraying one year, next year he tried to remedy that, but we found those trees were more rotten, and would break very easily with the wind, more easily than would have been the case had they not had that check at that time, and they did not get over it for a number of years.

Mr. Geo. I. Kellogg: I want to ask if the Burbank is hardy enough with you as a tree?

Mr. Bingham: The tree is perfectly hardy; I do not know of any tree in our orchard that is hardier than the Burbank; much hardier than the Abundance, under our conditions. The fruit buds will stand more cold, and bear fruit better than the Abundance.

Prof. Moore: We have to consider that Mr. Bingham is growing cherries on a commercial scale. I do not believe that Mr. Bingham recommends that cherries can be grown in the majority of this state on a commercial scale?

Mr. Bingham: No.

Prof. Moore: We are talking about home orchards, and we have got to confine ourselves to the fact that in the home

orchard we are going to try things which we know are not going to be a success financially; that is, we are not going to make money out of them, simply because we want something for use in the home, we must sacrifice a little in the way of cash to get that. If a man does not grow his cherries in his home orchard, he is not going to have any cherries, in nine cases out of ten, and for that reason he ought to plant some cherries, even if they do not give him cash returns, in order to have fruit for his home. I think we must not consider in this talk what we are going to do from the commercial standpoint, but the question is the home orchard, to consider it from that standpoint when we come to plant cherries.

Mr. Periam: What is the best cherry you have from the money standpoint?

Mr. Bingham: I think from the money standpoint there is not very much difference between the Early Richmond and Montmorency; the crop on one is about as great as the other. The hardiness of the tree is very similar; the care the varieties need is indentical and the fruit of the Montmorency is perhaps a little bit larger than the Early Richmond, and that is about the only difference. Take a handful of Montmorency and a handful of Early Richmond, no one can tell the difference by quality or color or shape. I have tried that time and again, no one can tell the difference. They are both of the Morello class, sour cherries.

Mr. Kellogg: I think the Early Richmond as a general thing in a farmer's garden is very unprofitable, the robins take every last cherry, they do not leave enough for a pie, if there are two bushels to the tree; that is the case in our county.

Mr. Bingham: I was just going to mention that if you have four or five trees, there might be a little advantage in having other fruit which the birds might take and leave the cherries. They are good judges of fruit and take what they want. They will pick out sweet cherry trees anywhere in the orchard and take those because they are a little nicer than the sour, but I believe every farmer ought to have a few cherries planted and take care of them right.

Mr. Smith: What varieties would you recommend for one to set, say ten plum trees for home use, in the northern part of the state?

Mr. Bingham. To be sure of plums nearly every year, I

would plant two or three Burbank, two or three natives of the good varieties, and two or three European varieties, of the hardiest sorts.

Mr. Smith: Name those sorts.

Mr. Bingham: Moore's Arctic, or Green Gage. Green Gage is a nice plum and hardy.

Mr. Smith: How about the Abundance, did we not see the Abundance on your place?

Mr. Bingham: Yes, but I would prefer the Burbank to Abundance for sureness of crop and hardiness of tree.

Mr. Smith: What is the objection to setting a few Abundance.

Mr. Bingham: Well, if you want my judgment in the matter, it would be the Burbank in preference to the Abundance. The Burbank is bearing this year, but with us the Abundance is not, it has a smaller fruit bud, very much smaller and weaker, and it may bloom perfectly and yet not set any plums.

Prof. Moore. Is not that due to brown rot?

Mr. Bingham. I do not think so; it seems to be a weakness of the fruit bud.

Mr. Kellogg: I object to Burbank and Abundance and Moore's Arctic for the southern and central portion of the state as not hardy enough.

Mr. Hager: How about Brown county?

Mr. Bingham: We cannot succeed with Japanese plums away from the Lake. There is a great area in this state where we have to confine our plum planting to native varieties. At La Crosse and all through the southwestern part of the state, I would not advise anything but the natives also through Crawford and Richland county, but when we get to the lake quality and productiveness is enough better to warrant planting Japanese varieties. I think any one planting native plums along the lake would experience more of a failure than in planting the Japanese from the fact that they do not do well in that damp climate, they do not bear.

Mr. Kellogg: I want to hear from L. G. Kellogg on cherries; he has had an experience that is worth something, just with failures.

Mr. L. G. Kellogg. I have made an utter failure in growing cherries for profit. I planted out about ten acres of cherries, Early Richmond and Montmorency, and I succeeded in obtain-

ing three or four crops. I gave them absolutely clean cultivation; I did not spray; mildew got into the cherry orchard and took the foliage off the trees, and that was the end of the cherry business.

The President: Do you think that spraying at any time would have saved the trees?

Mr. L. G. Kellogg: I do not think spraying would have saved the trees; that is my candid opinion, and I do not think you can make a success of growing cherries upon a prairie loam soil and give the trees absolutely clean cultivation. I think if you practiced clean cultivation until about the fifth or sixth year, and then seed down and cultivate between the rows, leaving grass grow under the trees, you may succeed in growing cherries upon a prairie loam soil. I know we have cherry trees growing in that vicinity that are fifteen to twenty years of age that are still producing cherries, cultivated in that way.

Prof. Moore. Mildew is very easily controlled by spraying. It is a fungous disease on the outside of the leaves, and it is the easiest thing to get at.

Mr. Bingham: While we consider Door county very favorable to the production of cherries, still I have no doubt that anyone would meet with absolute failure there in cherry culture in five years' time if he did not spray; if he did not control the shot-hole fungus, and mildew, he would have no orchard whatever. That has been illustrated at Sturgeon Bay by one one man who did not believe in spraying; there was simply a barbed wire between his orchard and another (sprayed) orchard; and his orchard was destroyed in one year with shot-hole fungus followed by a hard winter, and the trees were wrecks; he lost his crop of fruit that year and the following winter cut off two-thirds of the tops of the trees; and after that he went to sprayng, and his new trees are perfectly vigorous and healthy.

Mr. Smith: I would like to ask one question regarding location. At Ashland is some land which is mostly clay, with a little loam on top, perhaps it might be called a heavy clay loam lies about seventy-five feet above the lake, you can see the water beyond the town. There is nothing to prevent a free circulation of air; is that a good location for an orchard?

Mr. Bingham: I would say, we have cherry orchards in Door county on red clay, with a little loam on top, and I see no difference in the health and vigor of those trees over the

others; the only difference is, you know sandy soil needs more fertilizing than soil that has a heavy clay subsoil, and one of our most successful orchards is planted on a red clay soil, very red clay, just like the Superior red clay. Cherries will do well on clay if climatic conditions are favorable and given careful cultivation.

Mr. Buehler: Do you set out one or two year old trees.

Mr. Bingham: I think one can be successful using trees of either age. The two year old trees are larger; the one year takes a little more training than the two year old tree.

SMALL FRUITS.

RASPBERRIES, BLACKBERRIES, CURRANTS AND GOOSEBERRIES.

IRVING SMITH, Ashland, Wis.

The matter of cane and bush fruits for home use, should be given more attention than is unually given it. The amount of room required and labor given are very well repaid in the additional variety and quantity of fruit for the home table both summer and winter. Raspberries follow closely the strawberry, keeping up a continual supply of fresh table fruit. Gooseberries and currants come in turn during the raspberry season; and while they are not so much used in the fresh condition, a dish of well ripened white currants, sugared a half hour before eaten make a very nice evening fruit for any one who likes a mild acid fruit. As for gooseberries, I think they would be used much more in the various forms of cooked fruit if you would just forget that your grandmother used to make green gooseberry pie, and let them get ripe before picking. There is as much difference between green and ripe gooseberries as between green and ripe peaches. Blackberries follow in close succession with little or no break between them and the raspberry.

There are a number of good varieties to choose from, in Raspberries, which must of course be governed to a certain extent by local conditions. Cuthbert and Loudon are very fine red sucker varieties. The Cuthbert being the strongest grower with us, also

continues longer in season. Both are very fine. Columbian is the best of the purplish colored sorts and propagates from the tips of the canes like the black caps. If you have room for only one red variety let it be Columbian. Gregg is, in the writter's opinion, by far the best black cap. A row 100 ft. long of each variety named will give you an ample supply of fruit for any ordinary family, and also enough to give some to your friends.

Set the Loudon and Cuthbert about 3 ft. and the Columbian and Gregg about 5 ft. in the row, placing the rows 6 ft. apart. Bear in mind that no wild raspberries or blackberries ever grow in a swamp. So do not choose a drained swamp or you are likely to fail.

As soon as the fruit is off all the bearing canes should be cut out close to the ground; and the young ones thinned out leaving a few more than you expect to leave for the next crop, to allow for some being broken in covering. You should have four to six canes in each stool, and two to four canes per foot of row in sucker varieties for bearing. This point is governed by the size of growth.

Two methods of pruning the bearing canes are in common use. One is to nip the end of the cane when about two feet high, which causes a strong growth of the laterals and makes a low, branching bush. Then trim all the branches to fifteen to eighteen inches. This method applies more particularly to the Columbian and Gregg. The other is to allow the canes to grow naturally and then cut back to good strong well ripened wood on the Loudon and Cuthbert and on the other two cut at about the highest point of the cane. The writer prefers the latter method. It is less work and produces very good results. If you have time to spare of course one can push fruit growth by petting.

The only variety of gooseberry that is worth considering for the average home garden is the Downing. It is a heavy bearer of choice fruit about the size of cherries and becomes a yellowish green and is semi-transparent when ripe. Three or four bushes will produce enough for most families.

The Prince Albert currant now stands at the head in most sections. It is a vigorous grower, about four feet high and produces a heavy crop of large bright red currants hung on short well filled stems. As a jelly currant it is surpassed by none. Four or six bushes is enough.

The White Grape and White Dutch vie with each other for the

first place as a white currant. The White Grape is the largest fruit but the White Dutch is less sour and probably a little heavier bearer. Both are good to eat fresh or as a canned fruit, and both make beautiful jelly. Set four to six bushes.

Black currants. If you can find a variety that will fruit, set about half of one bush. If you fail to get any just get a few chinch bugs for flavor and you will not need the black currants. Set all the currants and gooseberries in a row seven feet from the raspberries. Set currants five to six feet apart and gooseberries three to four feet. Trim so each branch has free space to grow; they should not crowd or touch each other. When the bark changes color from a red green to black it is time to cut out that cane. Of course a few new ones must be left each year to replace the old ones. If you can, it is a good plan to go over the bushes after fruit is off and cut out the old black ones. It gives better chance for the younger ones to develop.

Watch for currant worms. They will appear first on the gooseberries. Poison with White Hellebore—one tablespoonfull to two gallons water. Sprinkle with water can.

Blackberries are the last to ripen and the least planted. Probably because they are more or less uncertain in many localities. The writer's experience with blackberries has been a great deal like most others, not wholly satisfactory. Ancient Briton and Snyder are the most common and the methods of culture are similar to raspberries. If you get a good crop a row 100 ft. long will be enough. If they do not fruit you certainly have enough and to spare.

All through central and northern Wisconsin raspberries and blackberries need winter protection. Probably the surest way is to bend down the canes and cover with earth.

All these fruits need good cultivation. Keep the weeds out, and fertilize annually. If the patch should get badly overrun with grass it is better to set a new patch than to try to get the grass out.

Prof. Moore: I think the Pearl gooseberry discounts the Downing a great deal; a much heavier bearer and just as nice a berry.

Mr. Smith: The Downing will bear until they cannot stand up; then what more do you want?

Prof. Moore: We get larger returns from our Pearl bushes than the Downing.

Mr. Kellogg: That paper is a very good paper for the beginner. I got one promising idea from it, that of flavoring jams and jellies with the chinch bug.

YOUR FAMILY STRAWBERRY BED.

C. L. PEARSON, Baraboo.

Growing strawberries is such an easy task that I will not make it appear difficult by reading a long essay. A family strawberry bed is easily within the reach of every farmer or any person who owns or controls a few rods of tillable ground; their cultivation is a pleasure while you are anticipating the possibilities of an enormous yield of the lucious fruit strictly home grown and the fun really begins with the ripening of the berries.

Having available ground the next question is in regard to plants; order of a reliable plant grower and you will be likely to get varieties which will pollenize and bear fruit.

I have known farmers to order plants of nursery agents at $2.50 a hundred and when fruiting time came round there were no berries. The cause of failure being the improper mating of varieties. Good plants can be bought at $1.00 a hundred or less and two hundred plants will supply a large family with berries besides some big ones to brag about and give to your friends. A good list of varieties is Warfield, Beder Wood, Dunlap, Crescent, Sample and Aroma and there are others.

The ground should be prepared early in the spring as for other garden crops. About May, 1st is the best time for transplanting. A spade or garden trowel can be used in setting the plants which should be in rows about 3½ ft. apart and 18 inches apart in the rows. The soil should be firmly pressed about the roots.

A family strawberry bed can be cultivated with a hoe and garden rake but if a horse and cultivator are available so much the better. If the plants send out too many runners cut off some of them and the result will be larger plants and better fruit.

About Nov. 1st cover the plants lightly with straw or some

coarse litter. In the spring remove a part of this covering leaving enough to help hold moisture in the soil and also keep berries clean. All that is necessary now are a few balmy days and the whole family may enjoy a month of genuine strawberry happiness.

Mr. Davis: I would suggest for the Warfield and Dunlap, that they would be better planted three feet in the row and three and one-half feet between the rows. I have been trying that way, and I think that is plenty close enough. You get too many plants most of the time then.

Mr. Hager. In a home garden, as a general thing fewer plants will be produced, because it will not be cultivated as well, so that I believe the same rule will not apply as to commercial growing. I would not advocate a person setting out two hundred and setting them that way.

Mr. Davis: I think you get plenty of plants any way; I think farmers as a rule have too many plants and they are not particular about thinning them out. I have grown them in the garden before I have grown them commercially, and I think plants should be 2½ by 3½ at the most.

Mr. Periam: We have had most excellent success in planting Warfield and Dunlap; they are planted three feet apart one way and eighteen inches the other; they were planted last spring and pretty well covered the ground. They were planted in the old-fashioned way, with an old post spade and trod down and we had a pretty good crop of berries; that was due to the fact that the last year was very dry, that the strawberry plants had better roots than usual, but for commercial work we must have a horse. The width apart that they should be planted depends upon the kind of berry. Some berries are strong growers. I think the mistake made generally among the amateurs is that they leave the roots too thick, that is, they leave too narrow a space between rows. I choose to have, not a matted row, but a row about ten inches across.

Mr. Davis: I would like to suggest the Bubach as the berry that has given the best satisfaction among home growers, that is, for table use, not for canning; the Bubach, Dunlap and Warfield, Dunlap as fertilizer, and of course these will have to be set at least 18 inches in the row as they do not run very well. I think you can get more quarts off the vine than from any other berry.

Mr. Kellogg: The Dunlap is generally used for a fertilizer; it fertilizes all right, but it does not produce the fruit; it does not hang on and carry out as big a crop of fruit. It is the berry for any one to plant if they have but one kind, but I am never satisfied with the result. I am growing thirty now, but the Dunlap and Warfield go together nicely, and I think one Dunlap and two Warfields would be about right for a successful crop, if the Warfield will do well on your ground. If you are subject to drouth and blight, the Warfield will be a failure. Bubach is successful once in about four years with me. It is a fancy berry and on clay soil will do well.

Mr. Pearsons: How is Sample with you?

Mr. Kellogg: Sample is all right. Sample is one of the best pistillates, and Cooper is the finest fertilizer for Sample that I know of, a well shaped berry.

Mr. Periam: Mr. Kellogg says that the Warfield will do well if the soil is all right for it. Is not that just as true of the Dunlap as it is of the Warfield, or is it not just as true of any other variety as it is of this? It seems to me that that is the real factor in the case. I never could raise the Bubach although I have not tried of late years. Sometimes the Dunlap does not seem to do very well; again it produces more berries than the Warfield, and so it goes. It is according to the variety and year and soil largely.

Mr. Kellogg: And the man.

The President: Iwould like to say in regard to Bubach, I have seen it attempted many times and have seen some fine berries, but in our part of the world we have had so many failures that we dropped Bubach a long time ago. I am satisfied if you try to raise Bubach you have to set your plants early so as to get the plants early enough to be perfect before winter. I have seen fine plants that failed to blossom the following year; I think it is quite important to use fairly early plants so that they are mature enough to get a crop the year following .

Mr. Kellogg. There are a good many varieties that make plants all right; Dunlap and Warfield will run all over creation, and climb over into your neighbor's lot and get you into trouble. Certain varieties like the Bubach and a number of other varieties you can plant together a great deal thicker than the Dunlap and Warfield; you can plant them three or four feet apart and they will cover the whole ground.

Mrs. Howlett: I think what Mr. Kellogg says about the Warfield is right on certain kinds of soil. We had an experience with the Warfield and Brandywine, the Warfield in drouth would dry out until there were no berries at all, while we had good crops of Brandywine on the same ground, right in the same locality. I think the Warfield dries out worse than some other varieties do on heavy soil.

Mr. Kellogg: Brandywine I consider one of the best late berries; I am glad to have it mentioned.

GRAPES.

MY HOME VINEYARD.

G. W. REIGLE, Madison, Wis.

My apple orchard, my strawberry plantation, my home vineyard, orally pronounced, are really more euphonius than "revise the tariff downward," "man behind the gun," or "big stick," and to many of us the former phrases easily hold first place in importance.

What grateful shade "my home vineyard" suggests. What harmony of odors surpassing even those of the sunny Indian island. Where else repose such tonic virtues the results of which have produced constellations of Rogers and Munsons. When and where the vine originated is quite as obscure as the early history of Greece and Rome and like the treasures of these ancient civilizations have survived the "dark ages," "the black plague," and "the brown rot," and is now pretty well distributed throughout the enlightened portion of the globe.

Its range of distribution surpasses that of the apple and like the apple succeeds best where wisdom is exercised in selecting varieties adapted to the soil and to the climatic conditions. To illustrate this, I think of no better example than that of the Worden grape.

In Wisconsin it ranks among our best, but in nearly all parts of the South this grape is practically worthless.

The home vineyard presupposes a shelter, a bit of land, a family, and a man: not one of those two-legged animals whose cerebrum is honey-combed with the mycelium of that incurable fungus of chronic laziness and carelessness.

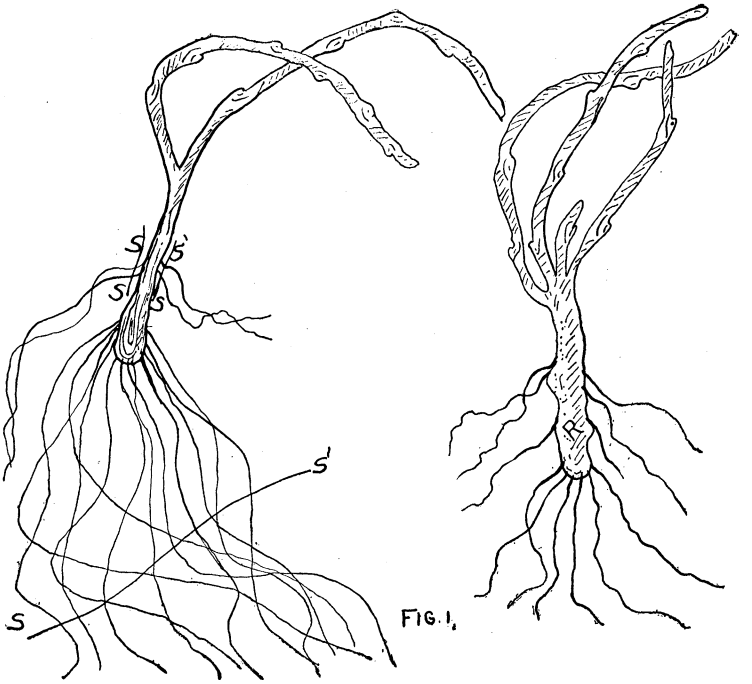


FIG. 1.

Note the difference in the root system; the one long and fibrous, the other short, weak and apparently diseased.

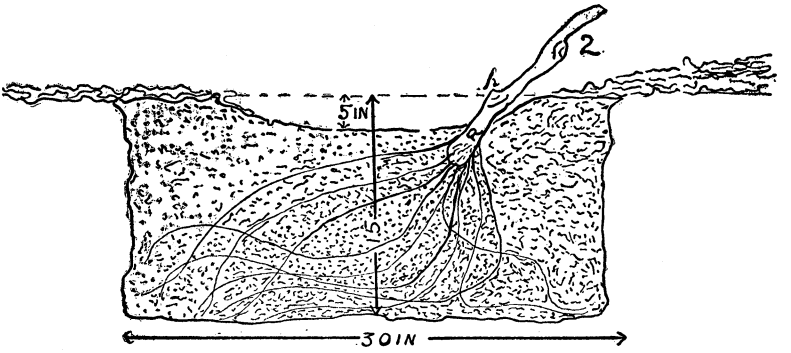


FIG. 2.

Usually the top soil is better supplied with humus than the deeper layers. This richer soil should be used to fill in the bottom of the excavation and to cover the roots. Firm the covering of the roots with both feet so that the earth shall come in close contact with each root.

Many details of grape growing for the home I shall of necessity omit; taking it for granted that the ordinary methods of planting and tillage are so well known that comment on this part of my theme might prove wholly superfluous. The accompaning cuts and their legends will however help materially to make clear the brief discussion of details.

First Year.

1. Select well-drained soil, such as will produce good corn.

2. Buy No. 1, 1-year old selected vines N. Y. standard from an honest grape specialist. See Fig No. 1.

3. As a rule plant in the spring, twelve to fifteen inches deep leaving a saucer-shaped depression around the young vine. This basin should be filled in gradually as the season advances. Fig. No. 2.

4. After planting cut off all but one cane; on this leave two strong buds. (See Fig. No. 2 (1) and (2).

5. Do not plant in sod. Thorough tillage is imperative for best results.

6. The buds left (See Fig. 2 (1) and (2) will develop shoots variable in length; these shoots should be buried with earth in the fall after planting. Under normal conditions this earth covering is all the covering necessary. See Fig. No. 3.

Second Year.

1. Train the two canes, after pruning to about three feet in length, to a three wire trellis and then permit the vines to grow without pruning except the more vigorous growers which may be pinched when the shoots have reached the top of the trellis (four to six feet). See Fig. 4, Spring, Fig. 5, Autumn.

2. For the best results, clean cultivation is absolutely necessary from the time the soil is dry enough to cultivate in the spring until the fifteenth of September.

3. In Wisconsin fall pruning and protection from the severities of winter—the same as for the first year (See Fig. 2)—is recommended. Caution:

4. Do not allow the vines to overbear: two or three clusters to verify the variety are all the vine should mature.

5. When pruning, an important fact to keep in mind is that this year's fruit will grow from shoots of new wood arising from wood grown last year.

The home vineyardists of this state have little to fear from the various rots and mildews for the reason that the standard fungicides intelligently applied controls them.

The bird's-eye fungus, however, presents an entirely different proposition since it does not yield readily to Bordeaux mixture and spreads rapidly on leaf, fruit and vine. The remedy for anthracnose as this fungus is sometimes called is to remove from your vineyard all dead leaves, diseased fruit and rubbish. Wash or spray all vines, wires and posts with a 50% solution of iron sulphate in late spring before the foliage starts to grow. Heroic spraying with the standard Bordeaux mixture will then usually control this troublesome disease.

The grape is not subject to the ravages of the codling moth, nor the curculio in my locality, (Madison, Wis.) is easier to harvest and market than the apple, a more certain crop for me, and is an ideal fruit for the amateur to begin with, since he need not wait from six to ten years for results.

I recommend in black grapes for the home, Moore, Worden, Concord; in red, Delaware or Brighton and in white, Moore's Diamond or Niagara.

The honey bee by some strange magic may by feeding and manipulation convert a larva in any common or vulgar brood cell into that most wonderful of created things, the queen bee. So the tree and the vine have elaborated a potent elixer whose power has metamorphosed many a common clod and behold a king over fruits has appeared.

It was along time ago when the tree said unto the vine "Come and rule over me." The vine becoming greatly troubled with her added responsibilities said one day to man "Do come and rule over me."

And thus it came to pass that a living soul became the guardian of both the tree and the vine and has continued thus even until the present day.

I was able this year, after a long search, to find some samples of anthracnose, and I will leave them here, and those who do not know it can come and look it over for themselves. I brought this along because I thought it was of enough importance for you to know it, so that you can spread the good work if you find vineyards that are affected by it. This is the Worden grape.

Mr. L. G. Kellogg: Does the antrhacnose very often attack a grape vine?

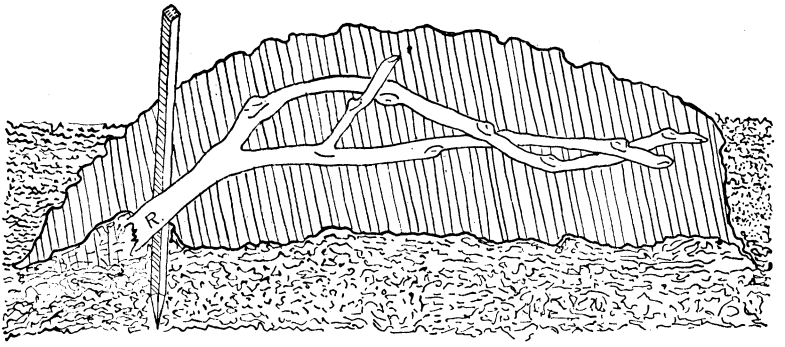


FIG. 3

Showing winter protection.

When the earth covering is considered inadequate, an extra covering of coarse manure will give the desired protection.

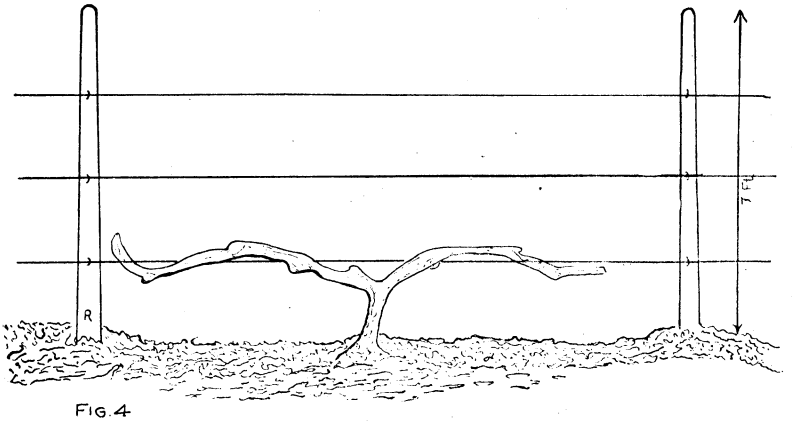


FIG. 4

Plant the vines seven feet apart in the row; the rows should not be less than six feet apart; seven feet to nine feet for the vigorous growers is the common practice.

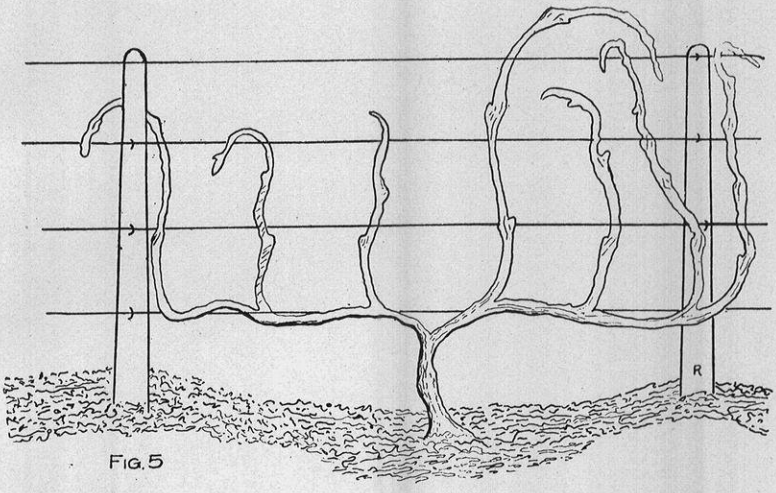


FIG. 5

After the foliage has fallen in the autumn of the second year the vine may resemble Fig. 5.

Beginning at the left, the second, third and fifth canes may be pruned back to the horizontal arm, leaving one bud. The other canes may be cut back so as to leave six or seven buds.

Mr. Reigle: Yes, all you have to do is to examine the leaf, and here are three berries that are well marked, where it is just beginning. Last year it was very bad and spraying had to be done frequently, as often as every seven or ten days, to keep in check. This year, as I said, it is very difficult to find it at all anywhere; I found it in two vineyards.

Mr. Kellogg: I would like to have go on record the best five varieties you would recommend for family use.

Mr. Reigle: I will name for the southern part of the state, or any part of the state where they will mature, Concord and Worden, Moore's Early, the Delaware for a red in place of Brighton, and for green, Niagara, first choice, Moore's Diamond second choice, for the southern part of the state and where they will ripen. I do not know whether they will ripen up in this part of the state or not.

Prof. Moore: What do you recommend for an early green?

Mr. Reigle: I would not recommend any early green; the only early green that I know of that amounts to anything is the Green Mountain.

Prof. Moore. Have you tried Moore's Diamond?

Mr. Reigle: I mentioned that being second choice for a green, Niagara first and Moore's Diamond second, that is in the southern part of the state. In the northern part of the state I understand the Concord does not ripen, in that case I would not plant it; I would plant the Moore's Early.

Mr. Kellogg: Wherever you can grow Dent corn you can grow Concord grape, and wherever you cannot grow anything but Yankee corn, you will have to plant something early.

AFTERNOON SESSION.

SOME RECOLLECTIONS OF A HURRIED TRIP THROUGH THE NORTHWEST.

W. S. HAGER.

After leaving St. Paul, one hundred miles west on the Canadian Pacific, there is not much of interest to a Horticulturist. Wheat, oats, and flax, with a few pieces of raw prairie here and there. Most places no fruit trees, very few gardens, and in

newer places not even a cotton-wood windbreak. It looks to me, even in the green summer and the golden harvest, bleak and desolate. What must it be in the winter? Houses there are for shelter, but homes in a true sense there are but few.

Having heard of the Kootenay and the Okanagan Valleys as fruit growing centers, we left the main line at Medicine Hat and crossed the Rockies through the Crow's Nest Pass and came down to Kootenay Lake at Creston. There were some small orchards here and they were well loaded.

Down the Lake there were few what I should call, available sites as the mountains came down to the water's edge. However, the enterprising promotor and real estate men had been here and up the Columbia and had laid out orchards on paper and in some instances had sold quite steep sites at the foot of the mountains along the river at prices from $150 to $250 per acre, covered with a dense growth of timber which would cost from $100 to $150 an acre to remove, trees and stumps.

I saw no orchards here but heard great stories as to what the land would do.

It is told that at Nelson, a small mining town, a stranger sat at the water's edge fishing. Suddenly, hearing a splash, he turned around to see a man crawling up out of the water, who, thereupon, began to apologize for disturbing the fish and explaining that he had fallen out of his orchard, and qualified it by saying that this was the second time today. However this may be, a person looking at the scenery from the boat would not doubt it.

Leaving the Columbia at Revelstoke one sees nothing in fruit until the Salmon Arm of the Shuswap Lake is reached where we saw some fine apples and thrifty trees. Land here suitable for fruit raising is high priced and with little chance for water. From here to the cost we saw no orchards of interest.

At the Exposition we saw some fine fruit from Hood River, Yakima Valley and Wenatchee. Each locality, of course, claiming superior advantages for growing choice fruit and quoting premiums and prizes to prove it.

Stopped off at Wenatchee and saw some of the orchards there. It is a valley which has been under irrigation for eight years, where the Wenatchee River joins the Columbia. Absolutely nothing grows without irrigation. There are about fourteen thousand acres in orchards of which fifteen per cent. perhaps are

bearing, mostly apples, although peaches, plums and cherries do well. Trees make a wonderful growth and commence bearing at three years of age.

Leading varieities grown are the Wine Sap, Delicious, Spitzenburg, Jonathan, Rome Beauty and Black Ben. Saw William Turner's orchard which produced the prize car load at Spokane last year. W. T. Clark has one hundred acres. Leddy Bros. have one hundred twenty acres, ninety acres bearing. Every man in town seems to be an apple enthusiast. And they have the goods. I did not see a dead tree nor a blighted twig or a wormy apple. They spray three times and have a thorough inspection of orchards and fruit. They get from $2.00 to $2.50 per box, F. O. B., and the returns are almost incredible. I talked with several growers who claimed to have received last year from twelve to fourteen hundred dollars per acre, net.

Very few orchards are for sale and these at from two to three thousand dollars per acre. Saw several who claimed to have refused three thousand.

Raw land that water can be gotten on is worth $500 an acre. Nearly all the land below the ditch is all set. However there is a pipe line across the Columbia and that side is being developed.

There are various pumping schemes and irrigation projects up the Columbia which perhaps are as good as Wenatchee.

They certainly are raising some fruit as they shipped one thousand cars last year. What will they do when the other eighty-five per cent. of the planting comes into bearing?

Will the favored valleys of the West be able to over-stock the apple market?

Mr. Kellogg: You did not invest while you were there?

Mr. Hager: Not yet.

Dr. Loope: Are you going to?

Mr. Hager: The future is uncertain.

Dr. Loope: Are they sure of getting a crop every year?

Mr. Hager: They must have got a crop last year, for they shipped a thousand cars, and they certainly have a crop this year—not all varieties were bearing this year, but I saw a large percentage of the trees were either propped up or should have been propped up.

Mr. Reigle: Did you learn how long after trees are set they begin to bear.

Mr. Hager: Yes, I made inquiries from several growers, not of men who had anything to sell, but simply went around; one place in particular I stopped where a man had five-acre tract, he said, "Four years ago next Sunday I came here; you see what I have."

Mr. Reigle: Did he have apples?

Mr. Hager: He had apples; he had cherry trees set out three years ago last spring of which the trunks were from four to five inches in diameter. They make twice the growth that they do under the most favorable circumstances in Wisconsin. I saw seven or eight year-old trees, and judging from Wisconsin standards I should say they were twelve to fifteen years old.

Mr. Reigle: Do they have a longer growing season?

Mr. Hager: Well, evidently not very much; it must be the soil. They have cold weather there; they admit the thermometer goes from ten to twenty below zero.

Mr. Kellogg: How much time were you able to spend in the fruit valleys?

Mr. Hager: In that particular place I spent twenty-four hours.

Mr. Kellogg: There is no more land left?

Mr. Hager: Very little in the Wenatchee Valley. I saw but two little pieces in the drive that I took about the valley.

Mr. Kellogg: All irrigated land?

Mr. Hager. All irrigated; could not raise a thing without it. But they get $2.50 a box.

The President: When I was listening to our friend Hager I was almost scared lest we would be put out of business, but I recovered when I heard the prices they receivd, for while they may feed the rich, there will be a market for our Wisconsin apples among the great masses of the people.

Mr. Hager: Those prices that they quoted me are the net prices there, the other man pays the freight.

CULTIVATION OF THE FARM ORCHARD AND FRUIT GARDEN.

PROF. J. G. MOORE.

When your secretary asked me to discuss this subject he explicitly stated that it was to be considered from the standpoint

of the busy farmer, and not as the man who grows fruit as a business would look at it. In accordance with these instructions I will endeavor to stick to the text, but for fear that at times some of you may think that I have forgoten, let me state here that the line which marks the difference between the cultivation of the orchard of the busy farmer and that of the commercial fruit grower is not as clearly drawn as is often times thought.

As a horticulturist, and especially as one who is interested in increasing the extent of fruit growing in Wisconsin, I suppose I should enthuse every time the home orchard is mentioned. I must confess, however, that when I think of the conditions under which nine-tenths of the home orchards of the state are expected to bear fruit I can see very little over which to enthuse.

What is the purpose of the farm orchard? If I understand it corectly, it is to furnish fruit for the use of the family for as long a period during the year as possible. It does not consider the sale of any fruit, or at least only a small amount of surplus. In other words, it is simply a supply for the home and not intended to bring in returns from outside sources. As every farmer should wish to place before his family just as good a quality of fruit as he would offer upon the market for his neighbor, it is to be expected that he is willing to give the orchard the the attention and care that will make such a condition possible This will necessarily include those practices which will give perfectly formed and developed fruit.

There is another point in the handling of the home orchard which we must consider in this connection. Unlike practically every other farm crop, the orchard is expected to give results year after year. No part of it is changed. The same soil supplies the food for the trees and in turn the same trees produce the fruit. You would not think of asking such a task from any other part of the farm or of any other plant. Our home orchard is quite comparable to some machine doing service in the field. In the first place it costs considerable to get one which is fitted to do the work which is to be required of it. Again, it must do the same work year after year the same as the machine. You would not think of running your binder year after year without oiling or repairing the worn parts. How about your orchard?

ABUSE OF THE ORCHARD.

What constitutes abuse of the orchard is a question which must be considered before any system of caring for it can be decided

upon. If present practices are such as will give the results expected of the orchard in the most economical way, then there is no need of a change or a discussion of other methods. I believe that the average home orchard in Wisconsin is operated at a loss to the farmer so far as the production of fruit is concerned. I further believe that the average farmer would be better off, from a monentary standpoint, if he would cut out his orchard and put the field into some other crop, unless he is willing to change his methods and give the orchard the care and attention which it deserves and demands.

Perhaps these statements will meet with adverse criticism and the reasons for such a belief will not be out of place at this time. Why is the average farm orchard operated at a loss? In making the above statement, it must be remembered that we were referring to the actual cash value of the fruit which is obtained from the area devoted to growing trees and not to returns from other crops which are grown in the orchard. The ordinary apple orchard in Wisconsin produces on an average a crop once in three years. In seasons of apple crops, from fifty to seventy-five per cent of the fruit is destroyed or injured by codling moth, curculio and apple scab. The plum orchards give even poorer results. Brown rot and curculio have become so prevalent that a plum crop is now the exception rather than the rule. Owing to these conditions the returns from the orchard is very small. Areas devoted to these crops then, under present methods, are not bringing in the returns they would if devoted to other crops.

But let us go a step farther. Suppose that the orchard is being cropped. Does it pay even then to have the fruit trees? While this is a much harder point to decide than the former, I think even in this case the answer would be negative. Consider the small return from the trees, the reduced crop which is produced under an average sized tree when a crop is being grown in the orchard, the extra time and labor expended in plowing, harrowing and cultivating around them, and I believe you will reach the same conclusion. If then, the deductions made above are correct would the farmer not be better off from a monetary standpoint if he cut out his trees and bought his fruit?

Perhaps this is an odd argument to present before a horticultural society which has in mind the extension of fruit growing in the state, but you must remember that I am discussing this, by

your secretary's instructions, from the standpoint of the busy farmer. The point I have been trying to make is this; the average farm orchard as it is operated today is a failure; the cause of its failure lies in the methods employed in its culture, and, unless the busy farmer is willing to give enough time from his other labors to care for his orchard better in the future than he has in the past, he will save money by giving up his half-hearted attempt and letting his neighbor grow fruit for him.

I desire to place myself on record as being in favor of the farm orchard conducted on right principles. While it may not be the most economical way of securing fruit for the home, I believe it can be made of value not only from the more aesthetic side, but from a monetary consideration as well. In these right principles I would include for the home orchard as well as for the commercial, all those principles pertaining to the various phases of culture,—spraying, pruning and cultivation. It is because I believe them all as essential to successful home orcharding as to a commercial project that I stated in the beginning that the line between the two is not as clearly drawn as is sometimes thought. As cultivation is the phase of orchard culture that has been assigned to me I will leave the others to other speakers.

CULTIVATION.

Cultivation of an orchard may mean any one of three things: clean culture, lack of cultivation, or cropping. Clean culture in the ordinary commercial orchard means working the soil until the latter part of July, followed by the sowing of a cover crop. Lack of cultivation includes those cases in which the sod is never disturbed. Cropping includes the raising of crops in the orchard. They may be hoed or cultivated crops or those which receive no tillage. Cultivation as now practiced in the home orchards of the state comes under one of the last two classes. In order to solve this problem of cultivation we must try to determine which of these three systems is the best. This done, we must then determine whether or not that system is advisable for the home orchard.

Within the past few years there has been considerable discussion as to the best methods of handling the commercial orchard. These discussions have brought about the carrying on of experiments to determine whether or not there is any very marked difference between the various systems. While the experiments

have been based upon commercial orchards, nevertheless what is valuable for obtaining the best results from a commercial orchard would be equally as beneficial if applied to the home orchard. I do not mean to say that the practices of the commercial orchard are always advisable in the home orchard, but that the principles applying to one apply equally as well to the other.

As the greater number of our home orchards are in permanent sod, let us first consider the advantages and disadvantages of this system. There are practically as wide differences under this system as there is between sod and clean culture. In order not to be misunderstood, we must consider some of these differences in detail. The majority of farm orchards which are in sod are made to serve two purposes. They are supposed to bear fruit and at the same time furnish pasture or a crop of hay. A great many farmers who practice this system when questioned upon it, inform you that some of the best horticulturists of the country recommended keeping the orchard in sod. While I admit this statement, I maintain that the farmer has drawn the wrong conclusion. The recommendations do not fit his case, for no good horticulturist recommends keeping the orchard in sod and at the same time taking from it the grass which grows there for pasturage or hay. This practice is beyond the pale of good horticulture and need not be considered further only to say that being under this system the large majority of home orchards are subjected to the worst treatment, so far as cultivation is concerned, that could be devised for them.

THE SOD-MULCH SYSTEM.

I have said that no good horticulturist recommends the system just outlined. How then has come about this mistake of thinking such is the case as is so frequently done? It is the outcome of a system largely promulgated by the Ohio Experiment Station and known as the Hitching's or sod-mulch system. The details of it vary somewhat but briefly are as follows: The orchard is left in sod permanently. All the grass grown upon it is cut and either left where it falls or else is gathered and placed around the base of the trees as a mulch. In the last few years, it has also been made to include the placing around the trees of additional litter such as straw or hay which did not grow on the orchard.

This system has been compared with the clean culture system

by which I mean as previously oulined, cultivation the first part of the season followed by a cover crop, and has been found to be much inferior in many respects. The growth of the trees in cultivated orchards is much greater, the general health of the trees better, and the crop returned not only larger but much superior in quality. In seasons of drought, the well-tilled orchard suffers much less than one under the sod-mulch system. This has been very noticeable during the present season in the orchards at the Experiment Station. Last year when dry weather prevailed during August, the amount of fruit falling from the trees was much greater in the sod than in the cultivated orchard.

Another important factor in comparing the two systems which is often overlooked is the one of insect pests. Our experience at the Station has been that insect pests are much more numerous in sod than in cultivated orchards. The prevalency of blight also deserves attention. This season should be a favorable one so far as the appearance of blight in the sod orchard is concerned, if the oft repeated statement that there is less blight in sod orchards is correct. We find, however, that blight is much worse in the sod than in the cultivated orchard.

There must be some good features of the sod-mulch system or else it would not be used. Probably the most important of these to the Wisconsin grower is the fact that the fruit of a sod-mulch orchard matures from one to two weeks earlier than when grown under cultivation. The color is heightened which is also of considerable importance. After all has been said for and against the sod-mulch system, it has a place in fruit growing in this state, and that is on locations which are so steep that washing becomes a serious matter when the soil is cultivated. Outside of these instances I do not favor the sod-mulch for the home orchard. The temptation for the average farmer to haul off the hay is too great to be resisted and as cultivation secures larger and better returns with only a slightly additional cost it is to be preferred.

After considering the various systems we have arrived at the same conclusion that the commercial orchardist would in sizing up the matter. Clean culture, with a cover crop, is the best system of orchard cultivation. We must now consider the second half of our question: Is this system advisable for the home orchard? From the standpoint of the busy farmer, the time spent in the various operations of orchard cultivation at the time when

other farm work is pressing, and for which only the small additional amount of fruit coming from a small orchard is the return is time spent at a loss.

ORCHARD CROPPING.

We have condemned the present sod orchard with its pasture or crop of hay. We have decided that the sod-mulch while adapted to certain special conditions is not the best system for a majority of our orchards, and that the clean culture method is not adapted to the home orchard. There is but one system left to which we may turn for a solution of this problem—cropping the orchard.

At the beginning of this discussion, I said that the orchard might be compared to your binder. Cultivation is to the orchard what oil is to the machine. Without oil the machine is soon valueless. Without cultivation the plant food in the soil is not furnished rapidly enough to the plant to enable it to give the best results of which it is capable. We must have cultivation if we are to get all out of the orchard that we should even if there need be some sacrifices in other respects. Sacrifices, however, are not necessary. Perhaps you could not afford a binder if you could only use it for cutting oats, but when you add barley and rye, it then becomes a good investment. The same is true of the orchard. While it may not be advisable to cultivate the home orchard for the fruit alone, when we can use this same cultivation as a means of producing other crops, it then becomes worth while.

When one advises cropping the orchard, he is approaching dangerous ground for there are so many chances of being misunderstood. I have already condemned one form of orchard cropping, and now to recommend another might appear to be inconsistent. Such is not necessarily the case. A binder in a field of oats is no more out of place than in a field of rye. However, if a farmer attempted to harvest his corn with an ordinary binder you would immediately think that there was something wrong. While certain crops are out of place in the orchard, there are others which are not only permissible, but often advisable. The growing of grain crops in the orchard is to be condemned just as severely as the growing of hay. On the other hand clean culture crops, most vegetables and small fruits are allowable. In a young orchard, corn and potatoes may be grown if the rows are kept some distance from the trees. As the or-

chard reaches fruit bearing, these crops should give way to others.

The subject assigned me included the fruit garden as well as the orchard, but I have purposely avoided saying anything about the cultivation of the fruit garden. So far this paper might be considered more destructive than constructive. In building a new building, it is sometimes necessary to tear down an old structure before you can begin the new. This has been largely the task I have had today. My new structure is to be built upon the foundation of the home orchard and fruit garden as a unity rather than two separate things. In other words I offer as the solution of the problem of the cultivation of the home orchard and fruit garden, the uniting of the two. Plan your orchard, select the varieties, set the trees, but all the time keep in mind that between the rows there are to be rows of small fruit, red and black raspberries, blackberries, currants, gooseberries and strawberries. Plan the rows so there will be one or two rows of small fruit between each two rows of fruit. Leave plenty of space to cultivate beteen the trees and small fruits, and between the rows of small fruit. If the orchard is so large that too much small fruit is needed to fill in between all the rows use the surplus for vegetables.

Cultivation now assumes a new phase. The small fruits must have it, therefore the tree fruits are not neglected. The task is a small one because the fruit plantation is compact. The benefits are so great that now there is sufficient to be gained that some of the other work can be put aside for the short time it takes to cultivate the orchard. Not only have you gained in the matter of cultivation, but in spraying and the various other fruit plantation operations as well.

There is one thing which we must not forget in this system, however. We are drawing largely upon the plant food in our soil. By dropping out the cover crop of the clean culture system, we have lost the means of getting vegetable material into the soil which is a very important matter. The supply of food and vegetable material must not be neglected. Barnyard manure must be used to supply any deficiencies, and the soil must not be allowed to become depleted before the work of restoration is taken up.

If the farmers of our state will follow some such plan as outlined above in the handling of their home orchards and fruit

plantations, the matter of cultivation will be so insignificant in comparison to the returns secured that orchard cultivation will no longer be looked upon as a luxury to be indulged in only by the commercial grower, but a necessity to be used by every man who grows fruit.

Prof. Moore: In connection with this paper, I have here worked out a plan for a one-acre farm orchard. This orchard contains thirty-six apple trees, four pears, eight cherries and twelve plums; it also includes currants, gooseberries, raspberries, blackberries and strawberries, all the small fruits that any one grows. The trees are set thirty feet between rows, small fruits are set in proportion.

Dr. Loope: How long are the rows?

Prof. Moore: About 295 feet.

Dr. Loope: Do you mean to plant raspberries and strawberries between the apple trees?

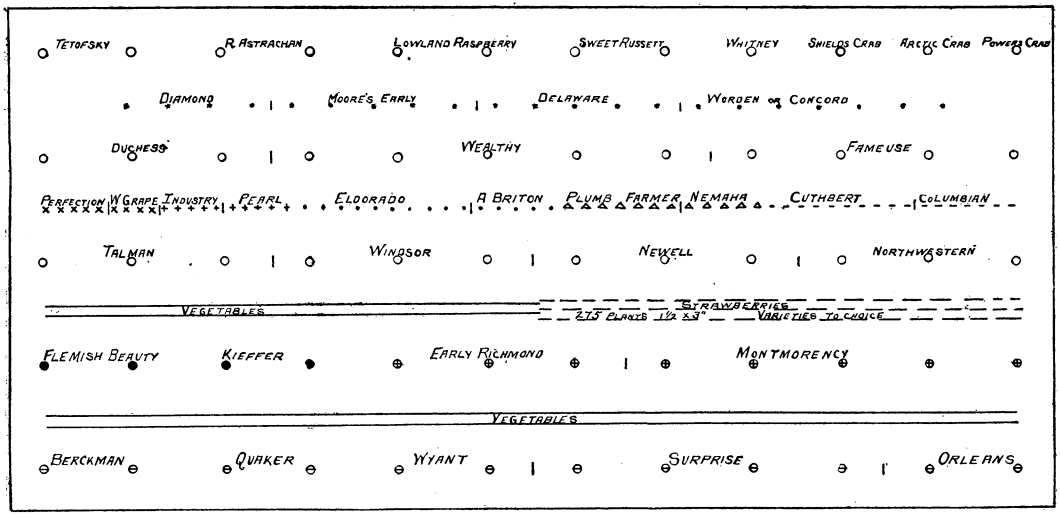
Prof. Moore: Yes.

Dr. Loope: Do you think you can do it successfully, do you not think they would draw too much from the ground?

Prof. Moore: That would depend on how close you set them. Of course the distance is to be considered. In fact, if the trees covered all the soil, then it would be necessary to remove the berries. The idea is, to get cultivation for your orchard, as well as for your small fruits.

A Member: The best success we ever had, we grubbed out oak trees and set apple trees and they are doing well. We planted them twelve to thirteen years ago and they are full of apples now. I have had quite a little experience with an apple orchard forty-six years old. We started a team plowing as though there were no apple trees there, commenced in the middle, when we got to the tree, we used one horse and set the plow so that we furrowed up to the row, then we have three men following up to spade one furrow and throw it right over; then when we come on the other side of the apple trees, we roll it right up and there are no back furrows.

Prof. Moore: This morning there was one question brought up which I thought might be discussed this afternoon. Mr. Hager said that farmers would not follow good practice in regard to their home orchard. Well, that may be true; I will meet



145 x 295 Ft.

10 Ft. from fence to end of rows

12½ Ft. from fence to outside rows

Scale 1 inch = 20 feet

SUGGESTIONS FOR

ONE ACRE

WISCONSIN FRUIT PLANTATION

Plat prepared by Prof. J. G. Moore.

Summary

32 Apples
4 Crab Apples
12 Plums
8 Cherries
4 Pears
21 Grapes
9 Currants
10 Gooseberries
15 Blackberries
12 Black Raspberries
17 Red Raspberries
275 Strawberries

Varieties

Apples - ○ 25 x 30 Ft.

2 Tetofsky
2 Red Astrachan
2 Lowland Raspberry
2 Sweet Russett
3 Duchess
5 Wealthy
4 Fameuse
3 Talman
3 Newell
3 Windsor
3 Northwestern
1 Whitney
1 Shields Crab
1 Arctic Crab
1 Powers Crab

Plums - ⊖ 25 x 30 Ft.

2 Berckman
2 Quaker
2 Wyant
4 Surprise
2 Orleans

Cherries - ⊕ 25 x 30 Ft.

3 Early Richmond
5 Montmorency

Pears - ● 25 x 30 Ft.

2 Flemish Beauty
2 Kieffer

Grapes - * 12 Ft.

4 Diamond
5 Moores Early
5 Delaware or Brighton
7 Worden or Concord

Currants - × 4 Ft.

5 Perfection
4 White Grape

Gooseberries - + 4 Ft.

5 Industry
5 Pearl

Blackberries - • 5 Ft.

10 Eldorado
5 Ancient Briton

Black Raspberry - △ 5 Ft.

7 Plumb Farmer
5 Nemaha

Red Raspberry - ▲ 4 Ft.

10 Cuthbert
7 Columbian

that objection in this way. I would like to ask how many farmers who were not growing orchards five years ago in Wisconsin have started growing? You would not need the fingers of one hand to count them. Now, while this may be a little out of place, we have come to this proposition, that unless we take care of our fruit better in the future than we have in the past, that the Wisconsin farm orchard is going just exactly the same way as the Michigan farm orchard, and that is that with the lack of cultivation and lack of proper handling today, the Michigan farm orchard is passing out; in ten years there will be very few good farm orchards in Michigan. Wisconsin is going just the same way. Perhaps we cannot get every farmer to take up a system of this kind and cultivate, but just as soon as this farmer sees the benefit of cultivating fruit trees, just as much as he sees the benefit of cultivation of his corn, he is going to cultivate it. We go into a district and spray; we can get but one man to spray, but as soon as his neighbor sees he is getting results, then he will spray too.

A Member: If you spray trees pretty well before the berries get ripe, if you have strawberries in the rows, you are apt to get some of the poison on them.

Prof. Moore: You would have to eat several bushels of berries in order to get enough poison to hurt you.

The President: I want to say something in regard to this mixing up so many things in the orchard. A few years ago I noticed in Mr. Franklin Johnson's blackberries that there was quite a difference in the rows. He had planted blackberries eight feet apart and strawberries between; the strawberries lasted long enough so that they had a decided effect on the blackberries, the blackberries showed the bad effect of having the strawberries in between, and I am not quite sure if you try blackberries and raspberries in your orchard long enough to have it worth while, that you would find that they get badly in your way in orchard work.

Prof. Moore: Do you think the bad effect upon the trees or upon the small fruit would be as great if the small fruit was planted in the orchard, as it would to have both small fruits and orchard setting in sod?

The President: I will answer, if you get up a man's enthusiasm sufficiently to cultivate his orchard, why in the world make it so much harder to do it as to put those things in, when he can

do both better by having them separate, and he could cultivate in his orchard beans and various crops that could be got rid of when he wanted to, instead of holding them in the ground longer than he wanted to hold them.

SPRAYING THE FARM ORCHARD.

PROF. J. G. MILWARD.

To facilitate a prompt discussion of essential details, the writer has in mind a mixed orchard of about 300 bearing trees. It is not intended to make any comparison between commercial and farm orchard spraying, as obviously, the work in the farm orchard is merely an application of methods which have been found profitable on a commercial basis. From the size of the orchard selected, the small fruit grower should be able to make the necessary applications to his own conditions.

What will be the cost per acre of spraying 300 bearing trees? An itemized statement prepared this season from spraying six acres of apples is given.

Bordeaux mixture formula:	
Blue vitrol	8 lbs.
Lime	10 lbs.
Water	100 gals.

The cost of 100 gallons of Bordeaux mixture equals approximately sixty cents. As indicated in the statement eight pounds of Arsenate of Lead is added which brings the total cost of 100 gallons of spray mixture up to $1.50. The necessity of giving attention to the dates mentioned is important, inasmuch as they cover the season when the common orchard pests are at work on the trees. The statement given makes full allowance for labor and expense, and if the fruit grower is not willing to make the investment indicated (relative of course, to his own conditions) he had better not attempt orchard spraying.

1st application, (May 6) ——— 250 gals.	$1.50
2d application, (May 18) poison, 300 gals.	4.50
3d application, (June 2) poison, 600 gals.	9.00
4th application, (June 21) poison, 600 gals.	9.00
5th application, (July 14) poison, 600 gals.	9.00
Total labor 4 days for 2 men and team	20.00
Total cost	53.00

Cost of spraying per acre, five applications	8.83
Investment in Machinery:	
Large size barrel pump	$18.00
30 feet, ½″ extra heavy hose	6.00
1 triple Vermorel nozzle	2.00
1 extension rod, 10 ft. bamboo	1.50
Total	$27.50

Note. A reasonable discount on the above may be had from most firms on a full order.

Utensils. Most fruit growers begin work with too few utensils for mixing. Where barrels are used, at least five should be available with a capacity of 50 gallons each. Stock solutions of both blue vitrol and lime should be prepared as directed, and three barrels should be used for mixing purposes. Provide either a burlap or brass strainer and two cheap, ten-quart mixing pails. Where access to water flow through pipes is available, this system of mixing could of course, be extended to larger tanks, and the gravity system of filling used as a substitute for the dipping process. However, these methods apply more to commercial orchard spraying. Easy access to a good water supply reduces the labor of mixing.

Mixing Details. Where 500 gallons of spray mixture is required for an application prepare as follows:

The day before spraying suspend forty pounds of blue vitrol in forty gallons of water. Hang the sack of blue vitrol high up in the water or it will not dissolve. This makes blue vitrol stock solution, one gallon of which equals one pound of blue vitrol as per formula.

Slake fifty pounds of fresh stone lime in another barrel taking care not to "burn" or "drown" the lime. Let stand as thick hot lime for one hour, stirring occasionally. Dilute to one-half barrel. This makes lime stock solution, one gallon of which equals two pounds of lime in the formula.

To make 100 gallons of Bordeaux mixture as per formula given above pour eight gallons of blue vitrol in one 50 gallon barrel and fill with water. Pour five gallons of lime stock solution in another 50 gallon barrel and fill with water. Strain at the same time equal amounts of these two solutions through a burlap sack, into a clean barrel. This makes the Bordeaux mixture. The mixture may then be poured directly into the spray tank.

Combination Mixtures. From the statement given above poison was added in four of the five applications. The poison is added to the mixture just before starting for the orchard. Arsenate of Lead should be added at the strength of four pounds per 50 gallons of spray mixture. If Paris Green is used, 12 to 14 ounces should be added to 50 gallons of mixture. The labor involved in reducing the Arsenate of Lead to a thin consistency is minimized if large quantities are reduced at one time.

Field Methods. Labor in mixing may be reduced by mounting the pump in a 75 or 100 gallon tank. The outfit may then be hauled conveniently on low trucks or upon an ordinary lumber wagon. If plenty of labor is available, two leads of hose 25 feet long may be run from a large sized barrel pump. In most cases, however, a single lead of hose with a triple nozzle will be more desirable. In this case, one man can do the pumping and drive the outfit. To insure rapidity and thoroughness in the orchard, the following precautions are necessary:

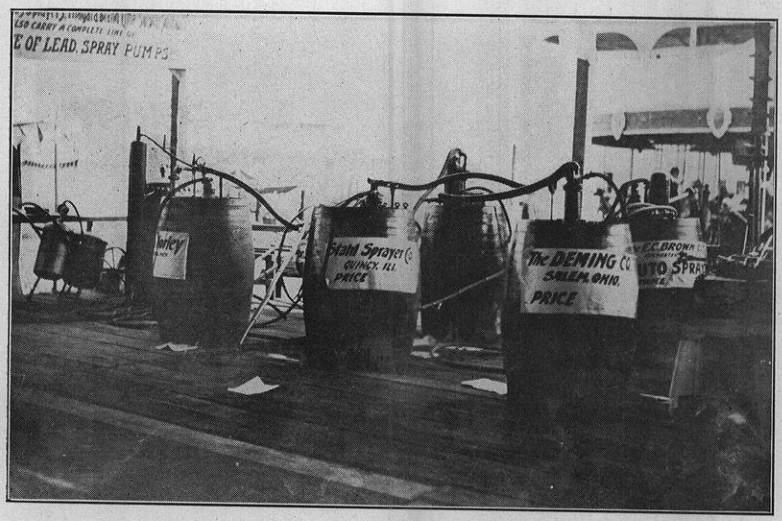
1. Attention must be given to thoroughly strain all spray mixtures and to keep the tank, pump, and pipes free from scales. Grit in the spray mixture causes delay and injures the efficiency of the spray nozzles.

2. The spray pump must be kept at the highest state of efficiency. The cylinder should be repacked each season, and after each spraying the pump should be cleaned and oiled. The corrosion and wearing of spray pumps may be minimized by this treatment.

Attention should be given to secure a high pressure spray. Coarse nozzles are wasteful and do unsatisfactory work The mixture should be forced through fine mist nozzles at high pressures. Good Vermorel nozzles require at least fifty pounds pressure to spray economically.

Standard Spray Mixtures. Notwithstanding the development of the insecticide and fungicide business, it would not be advisable to recommend a very wide selection in the use of spray mixtures. Where orchard spraying has extended farthest, the standard wet Bordeaux mixture still remains the most efficient fungicide. Among the insecticides, Paris Green and Arsenate of Lead are as yet most generally used. Some growers have tried the homemade poisons, including Arsenate of Lead, Arsenate of Lime, and Arsenate of Soda. There is a deep seated

State Fair Exhibit, 1909.



Some of the barrel pumps shown at the State Fair.

prejudice against home made poisons, however, due largely to the labor involved in preparation. It is more advisable for the average orchardist to purchase commercial prepared poisons. As yet, we have no efficient substitute for the standard wet Bordeaux mixture. However, Experiment Stations are testing the fungicidal value of lime sulpher mixture and perfected results on this work may be expected in the near future.

WHAT THE FRUIT GROWER SHOULD KNOW ABOUT FRUIT DISEASES AND INSECTS.

Let us line up the list of important pests, both fungus and insect, which the Wisconsin orchardist has to control. *Insects.* The codling moth, apple and plum curculio, gouger, tree aphis and oyster shell bark louse. *Fungus diseases.* Apple scab, bitter rot, apple rust, plum brown rot, shothole fungus, and other less important diseases. Fortunately, most of these pests are controlled by the combination mixture (Bordeaux and Arsenate, either Paris Green or Arsenate of Lead) mentioned in the itemized statement above.

In reference to the above mentioned pests, there are some current opinions which probably the orchardist should not know. In some sections the fruit growers refuse to conceive the true practical relation of these microscopic pests to the evidence of injury which is open to the naked eye. There is yet a tendency to throw up the hands and hold that the apple scab and rot is merely a result of weather conditions, and beyond the reach of artificial means of control. The relation of a practical understanding of these things is important to success in orchard spraying. The busy fruit grower is not expected to be an entomologist or pathologist, but he should accept the results of practical horticultural investigations along these lines in preference to the theories of irresponsible parties.

In the application of the principles just mentioned, most orchardists usually fail to continue spraying until the danger from insects and diseases has passed. The approximate dates which are recommended for the application of spray mixtures are timed in accordance with the chances of reaching the orchard pests when they are most readily controlled.

What percentage of fruit harvested in Wisconsin is sound? The writer has taken occasion to examine the output of several apple orchards in the state, and has often found as high as

75 per cent of the crop infested with worms. Add to this injury that from scab and rot also, and any informed horticulturist will agree that the loss is sufficient to warrant the adoption of economical methods of control.

As opposed to the conditions just mentioned, the writer has seen orchards which have yielded unsound fruit, turned by a system of spraying into profitable orchards, when as high as 90 per cent of the crop was sound. It should be remembered that the evidence of benefit is not alone indicated by the superiority of the fruit, but also by the increased health and vigor of the trees.

Before closing, it is advisable to enumerate several problems inclusive under this discussion, but which have been purposely omitted because they have been thoroughly handled in standard bulletins and reports. These include a list of formulae for spray mixtures; detailed discussion upon spray machinery; special reference to scale insects. Upon these points, and in fact the whole question, horticulturists are urged to avail themselves of the reports and bulletins of the Horticultural Society and the Agricultural Experiment Station. Attention is also directed to the fact that orchard spraying is in progress in the State under the system of the University Extension, and it is especially intended that Wisconsin horticulturists should keep in touch with this work. There is room for the extension of economical orchard spraying among the horticulturists of Wisconsin.

Mr. Tiplady: Are these new tree bands used to any extent in the orchards, to keep insects from crawling up the trees?

Mr. Milward: I have never seen them used.

Prof. Moore: The tree bands are good for but very few insects, but there is no object in using the bands because you have to spray for codling moth and get the canker worm anyway. How much lime do you use?

Mr. Milward: We use eight pounds of blue vitriol and ten pounds of lime to 100 gallons of water.

Mr. Smith: You said something about the kind of nozzle one should use with a high or low pressure.

Mr. Milward: Yes, you can get various degrees of spray, fine or coarse. I said if you use the coarse nozzle it sprinkles it on the trees instead of spraying. You cannot use low pressure and

do effective work. You want high pressure, a fine spray, instead of a coarse nozzle and spraying with low pressure.

Mr. Kellogg: How are you going to prevent clogging?

Mr. Milward: There is a strainer inside of the spray tank. Another thing is to clean out the spray tank; if you allow scales to form inside of your spray tank you will have trouble. See that there are strainers from the suction pipe to the pump.

Mr. Kellogg: Is there any danger of getting too much Paris green?

Mr. Milward: No, sir, not with the Bordeaux mixture, if you are anywhere within reasonable limits; you can put in plenty of lime. I never saw an injury from Paris green.

A Member: How much do you use?

Mr. Milward: I use from 12 to 14 ounces to 50 gallons.

A Member: Would you want to give the impression that you use a pound of Paris green,—you say you never saw any injury, do you want to give the impression that you use as high as a pound?

Mr. Milward: Yes, I have used as high as a pound with the Bordeaux mixture.

Mr. Reigle: I would like to suggest one thing I did not hear Mr. Milward mention in reference to nozzles, and that is the swivel nozzle. You want to get one that will turn so that you can stand at one side of the tree and turn it so as to throw it under or on the side of the tree.

Dr. Loope: Do you ever find bronzing of apples from spraying?

Mr. Milward: You mean an attack similar to that? (Exhibiting specimen.) That brings up an important question. In spraying orchards some seasons, I have seen that appearance on apples, where there has been an application of Bordeaux mixture; I have investigated the question quite thoroughly, and I think undoubtedly that russeting of the skin arises from two causes; one, that it is a mechanical injury of the spray mixture being thrown against the tender skin of the apple early in the season. When the apple is growing very rapidly, and especially some of the varieties such as the Longfield, if you use the power sprayer, and it is more noticeable where power sprayers are used, and force the spray mixture against the apples, you will find some that are affected in this way. It is partly due, perhaps, to chemical causes; authorities disagree on that, but I think it is

a combination of the two. It is objectionable, but it is not nearly as objectionable as the scab would be.

Dr. Loope: I have used the power sprayer at a pressure of 130 to 160 pounds, and I have used also the barrel spray, and often with the barrel spray I found more of that brown than with the other.

Mr. Milward: It will be different in different seasons. I think the matter of pressure has much to do with it. Also a difference in the skin; there seem to be some varieties that are more susceptible than others.

The President: As Mr. Herbst is not here, I will ask Mr. Smith to speak on "The Vegetable Garden, One Side of the Question."

The Secretary: Perhaps it would be better to hear from the other side first. When I put Mr. Ingham down on the program, I scarcely expected he would be here, as he lives in Pennsylvania, in fact, I knew he would not be here. I was attraced by an article that he had writiten for one of the agricultural papers, a rather unique presentation of the subject of the farmer's garden. There are some rather startling facts in this brief paper. I want to say, I am not in any sense responsible for them, any more than I am responsible for Prof. Moore's argument on the farmer's orchard.

WHY FARMERS DON'T HAVE GOOD GARDENS.

J. W. INGHAM, Pennsylvania.

It would give me great pleasure, if possible, to meet the members of the Wisconsin State Horticultural Society at La Crosse in August next. Societies, like corporations, when properly conducted, do much good. The work of many minds, and numerous hands, can accomplish more in a special field than the labors of a few. The discoveries, and improvements of each member, soon become the property of all, and all are energized, psychologized and stimulated to greater efforts by contact with each other. The reports of these meetings and discussions are widely published, are read, enjoyed and remembered by thousands who cast the college bulletins aside unopened.

It is generally agreed that for some reason, the particular branch of horticulturee which consists in the care and cultivation

of gardens, by the majority of farmers, is not practiced successfully—that the majority have poor gardens and the majority do not deny it. Some writers have ridiculed farmer's gardens by saying they had to take a scythe and mow the weeds before they could find their vegetables.

The late Waldo F. Brown of Ohio, said: "A majority of farmers fall below their privileges in not having a good garden." Of course they do. They have the *privilege*—there is no law against it, either human or divine, then why don't they have one? They have the privilege of going to the seaside, or some fashionable summer resort of the wealthy during the heated term, to obtain the pleasure and comfort to be there obtained. Then why do they not go? The simple reason is they neither have the time nor the money to spare. Some farmers may be in debt for their farms, or improvements, and must raise money, and all are anxious to raise good field crops to obtain funds to erect new buildings or put down some tile drains. Good field crops are absolutely necessary to profitable farming and *must* have the tillage at the proper time, and as often as required to secure a good yield. The *field* crops are the farmer's main dependence, the gardens are not. Perhaps some one will dispute me here by saying that the garden is the most profitable piece of ground on the farm and pays the best for the labor expended and the manure put on it. According to my experience a family will eat nearly as much bread, butter and meat and drink just as much tea and coffee and consume twice as much sugar when they have good gardens and plenty of pie plant, currants, gooseberries, raspberries, strawberries and grapes. A good garden is a luxury, not a necessity. Perhaps someone will say that a good garden pays in saving doctor's bills. There is no proof to support it. There is more sickness during the garden season than in the winter. Summer complaint originates from the garden. That farmers don't have good gardens is evidence that good gardens do not pay in dollars and dimes. I have had a long experience in gardening and farming and I say it deliberately and without fear of successful contradiction that I can plow the ground, plant and tend the corn on ten acres with less labor than I can plant and tend a good half acre garden.

My land will produce 50 bushels of shelled corn per acre—call it only 48. Half the stalks will pay for cutting up with the corn harvester; one-eighth will pay for husking; half the stalks

will pay for drawing and shucking, leaving me 42 bushels per acre clear or 420 bushels on the ten acres, which at 50 cents per bushel will bring $210.00. If we deduct what the land would rent for—say $60.00 I would have $150.00 left for my labor and team work. How much clear money would I get for my labor and seed put on a half acre garden? Unless I lived near a village where I could dispose of part of the produce which would otherwise go to waste, I would get nothing that would pay taxes or store bills.

A wealthy neighbor once hired an English gardener to make and tend his half acre garden and it was all the work the man did. Of course the garden was a good one, but it cost $180.00 for six months work. The wealthy neighbor could have afforded the luxury of an excellent garden but it seemed to his economical mind like paying too dear for the "whistle" and afterward he had no better gardens than his poorer neighbors, but I think he made a mistake. I believe in having as good a garden as a farmer can afford without neglecting his field crops.

Fruit trees should not be placed in the garden. They soon grow so large they injure the vegetables and berries by their shade, and also by the extension of their roots rob their smaller neighbors of the moisture and fertility they need for perfect growth. My father had cherry trees, peach trees and dwarf pear trees set round the outside of his garden and they damaged it greatly. If farmers keep chickens they should certainly have a picket fence or some fence that will keep the chickens out. An old hen and chickens can do a great deal of damage in scratching the beds in fifteen minutes. The mischief they do is not easily repaired and is trying to the owner's patience.

I have no doubt the well informed farmers of Wisconsin very properly lay out their gardens in the form of a long parallel, plant their vegetables in rows far enough apart to cultivate between the rows with a horse and that they have a bed of asparagus on one side of the garden which requires but little labor to take care of and provides such tender, delicious and healthful food in the early spring.

The President: We will now call on Mr. Smith.

Mr. Smith: To begin with, I should say no farmer, unless it might perhaps have been Brigham Young, would have use for a half acre garden for his family. The last two seasons I have been experimenting with a farm garden up at Ashland. Went

up to Ashland on the first of August, turned under a sod which, most of it, had never been plowed before, composed of June grass and timothy; the ground was so hard that we had to ride the plow in order to get it under at all, and got it in some places four inches deep and in others not so deep. That is where I set a strawberry bed and had good strawberries this season. Only a few rods of ground are necessary to produce the ordinary garden, furnishing vegetables in sufficient quantity for a good sized family. The suggestion made to put them in long rows is good I think, also the suggestion to keep them out of the orchard is good.

I believe Mr. Ingham says good farmers usually do not have much of a garden; that is true to a certain extent, but the farmer's wife quite commonly has a garden. It is not perhaps model or ideal, and I might go further and say that that farmer does not realize when he comes in to a good dinner, how much of it comes out of that garden; he forgets that two or three things on his table his wife went out and picked out of the garden. I have now in Ashland a few hills of cucumbers, beets, carrots, cabbages, tomatoes, corn, squash, etc., when I think the conditions were, I might say, worse than almost any farmer could pick out on his place. The ground was a good deal like a strawberry bed, but where it was plowed it was a hard, white and some red clay that gets as hard as this floor, did not take very long either, and it gets hot; yet even under those conditions I have done about all the work in caring for those things in comparatively few evenings after supper. To be sure the sun does not set up there and it does not get dark until pretty nearly nine o'clock in June and July, I have come in ten minnutes to nine several times from setting plants in the garden, so we have long afternoons, but only a few hours' work per month are required to take care of a little patch of ground that will produce all of the small truck that the average farmer needs. A great deal has been said here about the farmer not having time for taking care of his garden, but it is simply an excuse, not a reason. The reason is that he likes to drive his team, likes the big fields a great deal better; the average farmer thinks it is frittering away time to work in the garden he would rather work outside in the larger fields. As I said, only a few hours' work per month during the first two or three months of the season is all that is

necessary to grow enough vegetables for any ordinary family. Perhaps I have said all I need to say on that subject.

The President: As the other fellow is not here to answer, we will not need to take a great while in discussing it, but still the subject is open for anyone who wishes to speak on it.

Mr. Kellogg: There is a great deal of truth in Mr. Ingham's paper, and what Friend Smith says is all fact, there are both sides to the question, but our friend Daniel Huntley, one of our former members of this Society who lived at Appleton, had his garden arranged so that as he went out from work at noon and out to work in the morning, he went out with his two-horse cultivator right down through his garden, had long rows, which he cultivated as he went out and as he came back to dinner and came back at night. He had a garden that did not cost much and it was worth something.

THE FARM BEAUTIFUL.

MR. JOHN TIPLADY.

The farm to be beautiful from a financial point of view must contain broad areas of well-developed land of growing crops and healthy herds of cattle and sheep, etc. The success of the farmer depends upon his ability to produce these conditions and put them on the market at the best possible price, meet his obligations, and have enough money and effort left to beautify his premises from an aesthetic point of view. To accomplish this he must have some knowledge of the many trees, shrubs, and vines best adapted for this purpose. How often we see trees, shrubs and flowers dotted all over the front yard or planted in straight rows across the premises. Both methods must be discouraged if not abandoned and the plantations arranged with tasty effect. A pleasant view should not be obstructed by any trees however beautiful, neither should any objectionable feature be left in sight of the sitting room windows. The judicious planting of trees and shrubs will bring about satisfactory results in either case. Where a quick growth is desired to screen the out-buildings some of the fined kinds of poplar, willow or basswood may be used in place of the box elder or soft maple, both of which have their place in the world but this is not in the front yard of an up-to-date Wisconsin farmer. I consider

the elm the most satisfactory tree for the farmer as well as a city tree and we have as many as thirty-two (32) varieties to select from. From the American white elm of historic fame and in all shapes and forms,—spreading and compact—large, small, plain leafed or curly, variegated, golden, purple or green, making the matter of selection difficult if not confusing. The average life of the elm is 250 years so that extreme care should be taken in regard to its permanent location.

The maple claims 2nd place in my estimation as a shade and ornamental tree for the front yard and of this genus we have at least 16 varieties to select from. Most familiar and useful of these is the hard or sugar maple of utility as well as beauty. The soft and weeping maple is included in the above list of varieties but where a little tinge of color is desired the red or purple leafed kinds should be carefully arranged and planted, adding the appearance of wealth to the collection and giving a color so pleasing from a distance. This variety is known as acer Schwedleri, an improved form of the Norway maple, of compact form and easy to transplant. Other varieties of maple which may be used in the transformation of the farm grounds are those whose foliage is either golden, spotted, or marginated or whose form is either pyramidal, spreading, weeping or dwarf. Conspicuous among the latter is the highly colored and deeply cut foliage of the Japanese varieties which, on account of their tender nature however do not come under the head of useful trees for the farm grounds. One of the most attractive features of the maple, a feature seldom if ever superseded by any other kind of tree is its deep and wonderful color effects during Autumn. It seems to remind us that the summer is past, that their duties are ended for another season and that in a short time the blasts of snowy winter will be upon us.

Important in the list of shade trees is the ash, two varieties being indigenous and well known subjects to the Wisconsin farmer, namely fraxinus Americana, The white ash and fraxinus sambucifolia The black ash, the former deriving its name from the color of its wood and the latter from the resemblance of its foliage to that of the elder (Sambucus). These two varieties of ash however drop their leaves quite early in the season and are superseded by a European variety "fraxinus excelsion" whose foliage hangs until killed by frost, making it a more desirable tree for lawn adornment, etc. This

variety can easily be identified by the jet-black appearance of the dormant bud. Any of the following varieties of poplar; silver, golden, Carolina, or pyramidal may be introduced into the plantation with good effect but not the Lombardy, whose shade is too scant and whose life too short to be of real value to the farmer. On my visit to Salt Lake City I was surprised to find the entire area planted to this useless tree, already showing signs of mortality and condemned the selection of the followers of Brigham Young, but found upon inquiry that this was the only kind of tree they thought would grow under the existing conditions.

The mighty oak, so familiar to all of us and so often spoken of as a symbol of strength is worthy of a place on the farm grounds, but the historical oak of a century ago seems to despair civilization and yearns for the tangled forest, with its dense underbrush of hazel, dogwood and briar. Another variety however quercus Palustris or pin oak has been discovered which submits itself to our conditions and has proven itself a really valuable tree for the farm grounds.

In connection with the above list may be added the proverbial chestnut or buckeye, which if given plenty of room forms a symmetrical tree. When covered with bloom in early summer it is much admired and considered a very satisfactory tree, and very common on the grounds of European farmers.

Of the less attractive but useful shade trees the American linden or basswood justly claims a place in the plantation. Its large leaves and spreading habit highly commend it and immense quantities of honey are collected from its flowers.

To further elaborate a selection may be made from some of the finer kinds such as purple-beech, weeping birch, maiden hair tree, purple plum, flowering crab and a host of evergreens most attractive and costly of which is the Colorado blue spruce and its types.

Personally I do not favor planting many of the various pines and spruces around the home. They possess a certain amount of beauty and make good windbreaks but there is always a somewhat "cemetery" appearance that does not appeal to me except in that part of the country where evergreens prevail.

Possibly just as confusing to the farmer is a selection and arrangement of suitable shrubs for the premises. Prior to this date much has been said of the value of native shrubs as a front

yard adornment so our thoughts may now be directed to some of the more desirous exotic or foreign kinds. Most useful and attractive of all possibly are the spireas, nearly all of which are of graceful habit, medium in size and possessing a marked variability in flower and leaf. Spirea Arguta and spirea Thunbergi are among the earliest to bloom both having pure white flowers during May and June. The variety S. Van Houtii is enveloped in a cloud of snowy whiteness. From the pink section may be recommended S. Bumalda, S. Billardi and callosa roseum, the variety S. Anthony Waterer being the nearest approach to red. Many of the spireas may be used to advantage as a hedge plant as well as for grouping.

The hydrangea should be included in every collection of choice shrubs and when properly grown present a magnificent sight either planted in groups or in the shrubbery. All three varieties should be included to prolong the blooming period. H. arborescens the native kind blooms the entire summer but is not so attractive as H. arborescens grandif. alba, a magnificent variety of recent introduction, whose blooming period is June and July, followed in August by the well-known H. paniculata Grandiflora. The blooms of the latter variety may be cut off at maturity and stored away for Christmas decorations.

The common lilac comes under the head of Syringa vulgaris of which we have over sixty varieties in purple, red, white, blue, ruby and intermediate shades. The blooming period can be lengthened by the addition of S. Persica, villosa Japonica and Pekinensis. The vulgaris hybrids come in double as well as single and are usually grown on their own roots to avoid suckering, but the Japanese forms are grafted on an allied stock, usually the Ligustrum or Privet.

Philadelphus, Tartarian honeysuckle, viburnums and weigelias should all have a prominent position in the shrub plantations. The old time privet "ligustrum vulgaris" is now superseded by L. Regalianum, Ibota and Amurense all of more graceful form and all perfectly hardy.

The purple and green varieties of barberry are always acceptable both having many interesting features in leaf, flower and fruit, besides their ability to stand abuse and look pleasant. They adapt themselves to all kinds of climates and conditions and when in full fruit early in winter form a beautiful con-

trast with the snow. Berberis Thunbergii the dwarf Japanese variety is used very extensively as a border plant. A new form of this variety has just very recently been introduced from Japan and will no doubt be accepted with the same grace as are other introductions from the Orient.

Climbing vines best adapted to the Wisconsin climate are by no means as numerous as the different kinds of trees and shrubs and may be divided into two classes, viz., self-supporting and non-supporting. Of the former ampelopsis Englemanii and A Veitchii are best adapted to cover the walls of a brick or stone house, both having the ability by the peculiar formation of their tendrils to stick to the smoothest surface. A. Veitchii is by far the more graceful but is not considered perfectly hardy whereas A. Englemanii is a native and can always be relied upon so when in doubt plant A. Englemanii.

Of the non-supporting kinds we have a larger variety to select from. Ampelopsis as usual heads the list with its variety. Quinquifolia or five leafed Virginia creeper, also a native and differing from Englemanii only by the formation of its tendrils which twine rather than stick and must have artificial support.

For covering porches, arbors or summer houses we have some very interesting and useful subjects, either in flower, fruit or leaf. Of the blooming kinds clematis paniculata grandiflora, C. Jackmanii and its many types and the trumpet vine (Bignonia Radicans) are the most showy while the bitter-sweet is best for fruit display.

PERENNIALS AND ANNUALS FOR THE FARM HOME.

CHAS. ELLIOTT, Lake Geneva, Wis.

The planting of flowers around the farm home greatly adds to its beauty as we travel along the coutry road we may often pass two neighboring farms that remind one of the backyard illustration entitled "Before and After" shown at the National Flower Show at the Chicago Coliseum.

Many farmhouse yards are adorned with a few scrub trees and bushes, the grass is in an unkempt state. There is of necessity the usual collection of antique farm implements, now out of commission, with the attendant hog and chickens. And there are others. A few well selected trees and shrubs surround a close

cropped lawn attended by beautiful flowers. I have in mind such a farmhouse that is tended by two sisters whose brothers follow the vocation of fruit growers. These sisters each spring gather up the leaves that form a natural protection for the plants and at the same time sow the seeds of annuals. Each week they mow the lawn that is surrounded by old fashioned annuals that furnish flowers from frost to frost. There are Peonies and Phlox, Asters and Marigolds, Hollyhocks and Goldenglow, Gladiolus and Tiger lillies and what not. There is a scene like home about this farm home and the income these ladies derive from their poultry is largely supplemented by the sale of boquets to the campers along the shore of our beautiful lake. A fellow delegate advised me to commence my paper with some little love story; here however I fall down and prefer rather to proceed at once to call your attention to the perennial class of plants.

Perennials are plants that live more than two years. Their other name is "legion" for they are many but I will only enumerate those that are popular, perfectly hardy and easy to obtain and I will endeavor to include in my list the ones that will give a succession of flowers the whole season.

The flower we most appreciate is not the last rose of summer but the first flower of spring and I remember how last spring we watched a small round bed from the east window of our cottage. These were hardy primroses edged with Snow on the Mountain (Arabis Alpina) and when those little flowers came how we loved them because there was no others. I want to recommend both these little flowers to you. They bloom in April and May. One of the earliest of perennials that I very much appreciate is the Doronicum often called "Leopards Bane." It is not so well known as it deserves to be. It has large daisy-like flowers of a beautiful yellow shade and appear in company with the better known bleeding heart (Dicentra spectabile). Both these deserve a place in any garden.

I will next call your attention to the Peony which is attaining the popularity it richly deserves. It is so early to flower, so beautiful in blossom and so easily managed that it will well repay the cost incurred in purchasing roots. Here are a half dozen good ones that are sold reasonably. Festiva alba, Festiva maxima, Francois Ortegal, rubra grandiflora, Souv de la Exposition, Golden Harnesh.

The hardy Phlox is indispensable to any garden and is one of the best for the farm. The following are good: La Soliel, Lustre, Eclearеau, Miss Linguard, Diplomat, La Mahdi.

The hardy white daisy known to us as Shasta daisy is one of my favorites but personally not being a Burbankite I prefer to call it as of old Chrysanthemum Maximum.

The old fashion Sweet William makes a nice edging for borders of perennials, blooming in June and July and among others that I would suggest are the columbine, aquilegia known in our section as honey suckle. I like the variety Chinensis best of all the genus.

Hollyhocks we find in any garden and the single sunflower (Helianthus) and the well known Golden Glow should not be omitted.

One of the latest flowers we have in the perennial section is the Anemone Japonica commonly called windflower. It is very free flowering and appears with our first frost in fall.

Before I turn to the annuals I would like to say a word in season for the hardy lilies. They are well worth planting especially lilium Candidum, Elegans, Philadelphicum, Superbum and Tigrinum. Perennials are best planted in late summer, the beds should be spaded two feet deep and liberally enriched with well rotted manure. The plants should be protected in winter with a covering of leaves or litter with a few old branches to keep them where they belong and each spring receive a mulch of good rotten compost.

Annuals are flowers that flower the first year from seed. Their colors are more striking than the Perennials and probably are preferred by the farmhouse gardeners.

The seeds of many annuals may be sown in the open ground in April and May and if carefully transplanted will make a fine show in summer. The following are all good.

Asters, both drawf and branching, phlox Drummondi, stocks, marigold; sweet peas; mignonette; nasturtium; cosmos; early flowering salvia and zinnia. Pansies also come under this heading although they may with a little extra protection be carried over the winter.

In concluding I must mention the dahlia and gladiolus The Dahlia is too well known to need recommendation, but the Gladiolus are not so well known but should be in every garden.

The bulbs should be lifted in fall and will keep good in any frost proof cellar.

LIST OF PERENNIALS & ANNUALS SUITABLE FOR THE FARM HOME.

Perennials.

Anemone, Japonica, commonly called "Windflower."
Aquilegia, commonly called Columbine.
Bocconia Cordata, commonly called Plume Poppy.
Chysanthemum Maximum, commonly called Shasta Daisy.
Convallaria Majalis, commonly called Lily of the Valley.
Delphinums, commonly called Larkspur.
Dianthus Barbatus, commonly called Sweet William.
Dicentra Spectablie, commonly called Bleeding Heart.
Helianthus, commonly called Sun Flower.
Iris Germanica, commonly called German Iris (Flag).
Lilium Auratum, commonly called Gold Band Japan Lily.
Lilium Candidum, commonly called Madonna Lily.
Lilium Elegans.
Lilium Superbum, commonly called Turks Cap Lily.
Lilium Tigrimum, commonly called Tiger Lily.
Lythrum Roseum, commonly called Loosestrife.
Monarda Didyma, commonly called Bee Balm.
Peony.
Phlox.

ANNUALS.

Asters
Antirrhinum, commonly called Snap Dragon
Cosmos
Mignonette
Nasturtium
Marigold
Phlox Drummondi
Salpiglossis
Stocks
Sweet Peas
Verbenas

TRANSACTIONS

TO THE

Wisconsin State Horticultural Society

WINTER MEETING.

Annual Convention, Madison, Jan. 18–20, 1910.

TUESDAY AFTERNOON, JANUARY 18.

SMALL FRUIT SESSION.

The meeting was called to order at 2 p .m. Following the invocation by Irving Smith President Toole called on Mr. Richardson for:

REPORT FROM THE SPARTA DISTRICT FOR THE SEASON OF 1909.

E. A. RICHARDSON, Mngr., Sparta Fruit Growers Assn.

The season of 1909 had some surprises, also some disappointments for the Small Fruit Growers in the Sparta District. The healthy condition of Strawberry plants when spring opened, and the vigorous growth which they made as the spring advanced, led us to believe that we might expect a fairly good crop. Although the plants were somewhat thin in the row, they were almost entirely free from black root which has been so prevalent for the last few years.

As the fruiting season came on we were somewhat disappointed to find that a great number of plants had no fruit stems, and that many put forth only one small stem with but very few berries.

In looking for a cause for these conditions, we came to the conclusion that owing to the late dry season of 1908, the plants did not mature enough to form fruit buds for the crop of 1909, as many of them had but one or two small roots to commence business when spring opened.

Owing to the healthy condition of the plants, our spring setting made a very vigorous growth, and now think that we have the best stand of plants we have had for the past three or four years. All rows in our fruiting beds being full, and as a general thing not too many plants to insure a good quality of fruit and of fair size where the ground is in a good state of fertility.

The Marlboro Red Raspberry, which has been the standby of the Raspberry growers in the past, and which for the last four or five years has been almost a total failure, surprised us very much in the new canes which it put forth, even in the older yards it bids fair to put forth a good crop the coming season. But the attention of the growers have turned to the Cuthbert and early King which of late have made a good growth of cane, and appear to be the money makers, notwithstanding that the Cuthbert comes in so late that we we are not able to get as good an average for the full crop as we did for the earlier varieties.

The Black Raspberry most grown for market at the present time is the Plum Farmer. This is an early berry, about the size of the Gregg but not quit as productive. The fact that it is an early berry, (about 10 days earlier than the Gregg) makes it very popular with our growers, as they have learned that it is the early fruit that brings the best prices.

Of the Blackberry, we have the Ancient Briton, Snyder, and Eldorado, growing in our section; and would say that the Eldorado is now being set to the exclusion of all others. This is an earlier berry than the Ancient Briton, coming on the market about with the Snyder, a much better berry as to flavor and carrying qualities, and more productive than the Snyder, but think that the Ancient Briton will yield more quarts per acre, although the Eldorado, coming as early as it does will give better returns in dollars and cents than either of the other two.

I am unable to give you any information about the Perfection currant as there are but very few currants and Gooseberries grown for market in the Sparta District.

Grapes were a very light crop, none being shipped from our station.

There appears to be a revival in the interest of horticulture, especially in the planting of the apple orchards. And as to the small fruits, we are expecting the largest shipments the coming season that have ever been forwarded from our district. The shipments by the Sparta Fruit Growers Ass'n, for 1909, amounted to about $60,000 this we expect to nearly double in 1910.

A Member: How about the New Eaton raspberry?

Mr. Richardson: It is not a berry that we care to recommend.

Dr. Loope: I would like to ask in regard to your gooseberries, what do they sell at?

Mr. Richardson: I think our gooseberries this year averaged $1.50 a crate. There is a market for a limited quantity of gooseberries, but a large quantity I do not think would find a ready sale, although I think the use of the gooseberry is growing every year. I would say in regard to the raspberry, around Sparta we are setting out a great many of the King for an early berry; it comes in earlier than the Cuthbert and it seems to be a firm shipper, and I think will be a better market berry for us than the Cuthbert, for the reason that the Cuthbert runs along until we are out of pickers, and it seems to be impossible to get pickers for the Cuthbert.

A Member: Can you tell us anything about the Plum Farmer?

Mr. Richardson: The Plum Farmer is being grown quite extensively with us as a black cap, it is about the size of the Gregg, coming in early, and consequently giving us an early market berry. In connection with this I would say that a good portion of our black raspberries, about sixteen hundred 24-pint cases, were Plum Farmer this year, and those averaged $2.25 a crate of 24 pints.

A Member: I would like to ask as to the limit of the market for currants?

Mr. Richardson: I think the market is unlimited for any

article, it depends on the price you want to get out of it. With us, currants this year averaged $1.37 a crate, but that is more than we can expect to get out of a crop of currants, an extensive crop. I should think one dollar a crate would be a good price.

Mr. Bingham: I would like to ask Mr. Richardson what the strawberries netted the growers this year at Sparta?

Mr. Richardson: We had nearly 30,000 cases for which we paid the growers $1.21 and a fraction of a cent a case.

Mr. A. J. Smith: I would like to hear a little more about the New Eaton raspberry. I have grown it a couple of years, and this year I had a full crop of it, and I found it the best raspberry I ever saw. It started fruiting earlier and it lasted longer than other kinds, and I did not find, as Mr. Richardson stated, that you could not pull the fruit off the bush easily; I found it just the same as any other variety, and all of my neighbors put the Eaton raspberry down as the best raspberry they ever saw. I exhibited it a good many times.

Mr. Hanchett: The Eaton Raspberry as we have it at Sparta is not a raspberry that we can recommend anybody to plant for the market. We find the Eaton will not pick readily, and this for the market we find an important point.

Mr. Coe: The difference that we find here, I take it, is the difference between a grower for home use and a grower for the market. My friend Smith here can oversee the picking of his raspberries and have them for the table in fine condition, have no trouble in harvesting them, but if you pick them a little bit early, before they are really ripe, I think they are hard to pick.

Mr. Geo. Kellogg: I would like to get a little more information on the Perfection Currant; some of us are interested in this new currant; we would like to know of some one who has grown it in our latitude to say something either for or against it.

Mr. Smith: I have grown it for years; I consider it the best currant that there is on the market. A year ago last summer the leaves dropped from other kinds, while the Perfection currant was as green as grass, bunches of currants almost like small bunches of grapes. I think it is the best currant I ever saw.

REPORT FROM STURGEON BAY DISTRICT.

Mr. D. E. Bingham: I have no report written, so I will give a brief account of the business as it was this last season. A year ago it was rather dry in the fall, and our rows of strawberries were not very thick, consequently we did not have as much of a fruiting growth as we would have had in a more favorable season. At the present time the acreage is perhaps not more than half of what it has been, and last summer we shipped about between 10,000 and 11,000 cases that netted the growers somewhere in the neighborhood of $1.10 or $1.11. The raspberry industry has practically been dropped, and we are not growing raspberries for anything more than the local market. Blackberries we are not growing. About a thousand cases of currants were grown and shipped.

REPORT FROM THE WARRENS DISTRICT.

Mr. W. H. Morse: I commence with the strawberry as it is the best berry we have. Our acreage for 1909 was about fifty acres, as near as I can give it, and we have about 100 or 125 acres for next year that are looking fine. The number of cases shipped last year was 5,100, that would only make about 100 cases to the acre, but East Warrens soil is very light and the dry weather cut the crop very short, but at South and West Warrens we have a good clay soil and we have a very good crop averaging from 200 to 250 cases to the acre. As to prices, our berries averaged $1.10 a case. As to varieties, about nine-tenths of our strawberries are Senator Dunlap, Warfield and Enhance, about two thirds more Dunlap than Enhance, and I will say that our Senator Dunlaps last year gave us more berries than any other variety we had. There are not many raspberries raised around Warrens. The average price this year was $1.66 and I find that was about what we netted last year and the year before. We generally pick from 150 to 250 cases of raspberries to the acre. Three years ago we picked from one acre and a half, 400 cases. We shipped 2,000 cases of blackberries from Warrens this year and they netted us about $1.30. We ship by express; most all these berries go to Minneapolis, ex-

Newly erected home of the Sparta Fruit Growers' Association. Co-operation pays.

Home of J. E. Bissel, Madeline Island; Duchess & Wealthy trees in the yard.

cepting a few on orders. We do not get the big prices that I see they do in Sparta, but we have better shipping facilities; they go by refrigerator cars, and we know what the prices are; we think we have a pretty good commission man at Minneapolis, we could not do better than he can do.

Mr. G. J. Kellogg: What is your best black raspberry?

Mr. Morse: We think the Kansas is about the best. We have the Plum Farmer, that is very good.

Mr. M. S. Kellogg: What varieties of blackberries?

Mr. Morse. Mostly Ancient Briton. They are raising a few Eldorados on account of their earliness, their price is better, they do not last as long as Ancient Briton.

A Member: Is the Eldorado as productive as the Ancient Briton?

Mr. Morse: No sir, they are not, but it is a nice big berry.

BIG BAYFIELD BERRIES.

HARVEY NOURSE, Bayfield, Wis.

The subject assigned to me by your Secretary suggests the style of berries grown at Bayfield, but if size of berry were all, this in itself would not make berry growing a success, however, we have the quality and the yield as well.

First, as to big berries, I have seen berries picked from my strawberry fields measure seven inches in circumference. One of our growers declares he filled a quart box with eight berries and quite a number of boxes each with sixteen and twenty berries. I have known a day's picking of the Senator Dunlap variety to count about 26 berries to the quart and there are other varieties much larger than the Senator Dunlap but we have yet to find in our section a better variety. F. V. Holston of our city, one of the first men to engage in strawberry growing, a number of years ago sold to the Stone-Ordean Company in Duluth two twenty-four quart crates of strawberries at $5.00 per crate under a guarantee that not a berry in the crate should measure less than five inches in circumference. They wrote Mr. Holston afterwards that they were very much pleased and the

berries were satisfactory in every way. From a two and one-fourth acre field of Dunlaps a year ago we picked 860 crates which sold for $1,272.68, which, after deducting cost of crates and picking, left a balance of $922.54 or about $400.00 per acre. Our field last season containing about three and a half acres yielded 1,250 crates that sold for $1,989.98, which after deducting cost of crates and picking, left a balance of nearly $1,500.00. Our crop last season was cut down by an exceedingly heavy rain storm which prevented our shipping any berries for nearly a week. Some idea of what we might have done may be had from the fact that from two day's picking of this field, after deducting commission and freight, we received $1,019.00 for the berries. Most of these berries were also of the Dunlap variety. A neighbor of mine from less than one-sixth of an acre sold $206.00 worth of berries. No spraying was done on any of the fields mentioned and very little fertilizer was used but they were thoroughly cultivated and a dust mulch maintained on the new fields during hot and dry weather and on old fields after fruiting.

Bayfield strawberries are extensively known to excel in quality, extra size and appearence. I have a letter in my office from the largest commission house in Duluth written me after the close of the berry season stating that our berries were the finest shipped to that market. The berries were shipped in refrigerator cars and sold for about $2.00 per sixteen quart crate, less commission and freight. We shipped one car to Minneapolis that sold for $2.25 per crate. Nearly 100 acres have been planted to strawberries the past season and as an evidence of the development of the Peninsula as a small fruit section allow me to quote from a letter received by one of our townsmen, from W. H. Hanchett of Sparta, Wisconsin. Mr. Hanchett says; "this order for berry crates makes a total of over 23,000 crates for Bayfield for the coming season and places this point second in importance in the State with Sparta first and Eau Claire a close third. If you double again next year, Sparta will have to look to her laurels as the chief place." The indications are that we will double and Sparta will have to give way to the Bayfield Peninsula.

The raspberry has not been planted extensively, however several acres were set last year and I understand quite a numben of acres will be set this coming spring. One grower alone

will set five acres. Those that have been grown in a small way prove to us what can be done. I don't think anyone could possibly grow larger Cuthberts than were picked from my small plantation last season, and the Plum Farmer Black Raspberry yielded at the rate of 7,000 quarts per acre. I shall plant quite largely to this variety next season.

As to the Blackberry, the Ancient Briton, is the variety generally grown. It grows to an enormous size and bears abundantly. We have one field in our town containing one-third of an acre that was planted eighteen years ago and has borne a good crop of berries each year since, however new fields will be set largely to the Eldorado. This variety follows the raspberry more closely and makes it a more satisfactory berry in several ways. Will also say that a great many acres will be planted to the currant which fruit also reaches perfection in our climate.

With this much for our small fruits I would like to say just a word concerning what we are doing with larger fruits. One hundred and twenty-five acres will have been set to cherries by next spring. This fruit excels in the Bayfield Peninsula; the trees load up with fruit each year. There is no doubt but what the Peninsula is destined to become one of the greatest cherry growing districts in the country. The largest apple orchard in the State is now located at Bayfield. This orchard comprises sixty acres and will have twenty acres more added to it next spring. This orchard is owned by Mr. William Knight, our delegate to the Convention. A great numbebr of other orchards of from two to ten acres have been planted and the trees generally are doing fine. There is something about the soil and climatic conditions of the Peninsula and Apostle Islands that make this section peculiarly adapted to fruit growing. This is very evident from the way trees load up with fruit and in this regard I should like to repeat what I stated in my paper read before the Minnesota Society, "Think of a one year English Morello cherry tree, thirteen months from planting, yielding seventy-six cherries and a Patten Greening apple tree planted the spring of 1906, yielding this season one hundred and six apples that averaged half a pound each." Two small Wealthy apple trees in my garden gave me four barrels of beautiful apples with not a wormy apple or one affected with scab to be found in the lot and so I might mention many instances of

remarkable yield but time will not permit. Should like to call attention, however, to the Duchess apple as grown with us. Think of having Duchess apples the middle of January that are firm and solid, kept on a shelf in an ordinary cellar! We have just such Duchess grown at Bayfield. I heard one genttleman at the Minnesota meeting make complaint because their town had no suitable express rate on apples and for this reason he could not ship the Duchess as it would be twenty-four hours in transit by freight. Our Duchess would ship to California and then back to New York, if necessary, and the planting of this variety in our section is going to make the growers lots of money, and so I might mention the Wealthy, Patten Greening and other varieties but this is out of line with my subject.

A few more words concerning another peculiarity that we cannot account for and that is this; the thimble berry, sometimes found in New York State and parts of New England and Washington grows wild throughout the Peninsula and Islands but is confined entirely to this section and what is known as the Washington Hazelnut, a very large species, is produced in the same way indicating that there is something peculiarly beneficial in our soil and lake climate for producing all kinds of fruit and particularly Bayfield Big Berries.

The President: I am sure if the Horticultural Societies of our state will speak the plain unvarnished truth about the resources of the state of Wisconsin and let the people know the facts, we will save a great deal of money to the state and save a great deal of disappointment to many people who are sending money out of the state.

Mr. Hanchett: Our president has told us that he hopes that the members of this society will take opportunity to get up and speak the plain, unvarnished truth about the horticulural resources of this state. Now, I would like the opportunity to ask Mr. Nourse why he did not speak the plain, unvarnished truth about the Plum Farmer raspberry crop. I had a little talk with him, he spent Sunday with me, and he gave me the real facts in regard to the Plum Farmer raspberry crop, which he did not give here, he told me the real yield was 12,000 quarts per acre, instead of 7,000.

Mr. Nourse: Well, that is the fact, it yielded that in my

garden, but I do not want to go on record as saying that we could grow Plum Farmer raspberries at the rate of 12,000 quarts, which figured up about $2,400 to the acre the way the Sparta people sell their berries, but I first got it down to 8,000, then down to 7,000, and then went on record at the rate of 7,000.

Mr. Philips: Mr. Nourse was like the Quaker advising his boy; he said it was a great deal better to tell a probable lie than an improbable truth.

STRAWBERRIES NEW AND OLD.

GEO. J. KELLOGG, Lake Mills, Wis.

New:

1st Norwood after 2 years' trial I place at the head of the list for every good point as a promising new variety.

Heritage, every way worthy—very early and holds very late, wonderfully productive and fine quality.

Ozark, best large early that will be satisfactorily productive.

Highland, early, productive, ripens its crop at about 3 pickings.

Corsican, of the Jessie type and superior to that variety in many ways.

Buster, for large size and productive.

Everbearing Kinds:

Pan American (H) poor plant maker but bears enormously till snow flies.

Autumn (P) wonderfully productive and bears till it freezes up. Repeater, worthy of trial.

Strawberries Old:

Dunlap and Warfield as best pair.

Haverland and Splendid for 2nd best pair.

Bubach and Klondike for best big berries.

Glen Mary and Wm. Belt for largest big berries for fancy market.

Parsons Beauty and Sample bring top prices.

Brandywine, Gandy and Stevens late.

Champion for best late, large and good shippers.

Best 3 for all purposes, Dunlap, Warfield and Brandywine.

Currants:

Best new, Wilder, Perfection, London Market and Pomona.

Best late, Victoria, Prince Albert, Long Bunch Holland, La Vesailise, White Grape, North Star and Red and White Dutch.

Gooseberries:

Best new, Pearl and Ozanne.

Best old, Downing, Red Jacket and for canning, Houghton.

Blackberries:

New, Eldorado, Mersereau and Early King.

Old and reliable, Snyder, Ancient Briton, Badger, Kittatinny, Stones Hardy and Erie.

Black Raspberries:

New, Plum Farmer, Black Diamond and Cumberland.

Old, Black, Gregg, Kansas, Palmer and Ohio.

Red Raspberries:

New, King Brilliant, Cardinal and Ruby.

Old Red, Loudon, Cuthbert, Brandywine, Marlborough and Miller.

Best purple tip raspberry. Columbian.

Best yellow, Golden Queen.

Grapes:

Best early, Moore's, Campbell's Green Mountain and Worden.

Best white, Lady, Diamond and Niagara, Concord where you can grow Dent Corn, Brighton, Agawam, Wilder and Merrimac.

Dr. Loope: I would like to know about the Glen Mary and what the success has been in different parts of the state with that.

Mr. Coe: The Glen Mary does very well with us, good grower, good berry.

A Member: I would like to ask this gentleman if he considered the Pan American worth raising for a fall crop?

Mr. Kellogg: I would not dabble with it, except for private use, for a private family, or for an amateur it is worth while to try it.

A Member: On our ground a year ago last summer we

raised 100 plants from five. We got seven plants and two of those died and from the five we raised 100 plants of Pan American, very rich soil, and we gave them good cultivation.

Mr. Moyle: Mr. Crawford of Ohio writes me that he has this season propagated several new varieties of fall-bearing strawberries and all are good. These were distributed in trial lots to nurserymen this year. In my opinion these fall-beaing kinds are valuable mainly in the home garden.

Mr. Kellogg: I want to say one more word in regard to the Autumn. After planting the original plantation, they bore so that I had one plant that had 118 berries, blossoms, and buds on it, that I took up and carried to the Jefferson county Fair. Another I carried to Beaver Dam that had fifty-three berries at once, and of course a plant that yields so much, they cannot be large, unless it is up at Bayfield. It might be there.

Mr. Richardson: I would like to say a word in favor of the Red Bird strawberry. We have only tried it in a small way the last two or three years, we find the color is good, it is of the Dunlap and Warfield type, good color, red berry and very productive. It is too early yet to say if it is going to stand up with the older ones, but the indications are that it will.

A Member: I would like to ask Mr. Kellogg about the Norwood.

Mr. Kellogg: I am very favorably impressed with the form, size, quality and productiveness.

A Member: I want to know what type it is.

Mr. Kellogg: It is of the type of the Jessie family.

REPORT ON STRAWBERRIES.

HENRY B. BLACKBURN, Richland Center, Wis.

Strawberries here this season a bumper crop; in my ten years experience this was an ideal year. Among the varieties that did extra well were Glen Mary, Senator Dunlap, Burbank, Wonder and Cardinal. Red Bird outyielded any on the list but the berries run too small and they are not the best flavor and are not any earlier than Senator Dunlap. It is a fine colored berry and even more hardy than Senator Dunlap. Stephen's Late

Champion, the great brag berry, is a great grower but when it comes to fruit it is disappointing in yield, flavor, size, etc., so many imperfect berries while Fremont Williams by its side is even later and twice as productive. It is just as vigorous a grower and all the berries average large, firm and smooth. With me it is the most productive late variety I have tried except it might be July. I have not tested it enough yet to know but I think it will even surpass Fremont Williams.

Virginia sold or introduced for extra early was disappointing in every respect.

Chespeake Late was a complete failure. Highland will be a wonder if it does as well another year as this year as it more than bears out the introducer's claim.

DOES INSPECTION OF SMALL FRUIT PAY THE GROWER.

By E. F. BABCOCK, Sparta.

The title of this paper "Does inspection of small fruit pay the grower" naturally suggests another and a greater question, "Does an association of growers and shippers benefit the grower" for as a matter of fact inspection and grading are simply necessary adjuncts to the machinery of a successful association.

The Inspector acts as an equalizer in fixing the grade and comparative value of the product of the grower and making it possible to bring the entire crop of any particular section under one management and thus relieve the grower of the labor and responsibility of marketing his product at a time when he is much needed at home.

It must always be kept in mind that small fruit is highly perishable and on its maturity must be moved with rapidity and despatch. Inspection makes it possible for the manager of an association to distribute his product to much better advantage than would be possible had it not been examined and its grade and shipping qualities determined, as some of it may be more firm and can be shipped a long distance with safety while the balance can be distributed to points nearer home to good advantage, even when all are of the same grade. This

system of intelligent distribution is one of the secrets of the great success of the Sparta Fruit Growers' Ass'n.

The buyer is also benefited by inspection, for under this system he is assured that stock will be selected each day that is best adapted to his use; if he be located a long distance from the point of shipment he knows that only the firmest stock will be consigned to him or if he be located near by he knows that he will get just what he desires, stock ready for home consumption.

Another benefit to the grower is the record of the Inspector of the quality of his product which may be very valuable in the pressing of damage claims, as his stock has been examined and its grade and shipping quality determined by a disinterested expert at the primary shipping point and the grower therefor is not handicapped by the fact that he only knew the condition of the stock when it was delivered to the carrying company.

The Inspector also acts as an instructor to the grower, and this has probably been the greatest benefit of all to the growers at Sparta, for as they deliver their product each day at the grading platform the Inspector is constantly looking for and pointing out defects in picking, packing or delivering and illustrating by comparison where they have failed and if possible suggesting a remedy. I have noticed that more than one-half of the low-grade stock was due either to the carelessness or the ignorance of the grower. These lessons have had their effect and today the general appearance of the stock brought to the Association has improved 100% and slack filled boxes, over-ripe fruit, or stock delivered in a mussy condition from rough handling is a rare exception.

That the retailer appreciates the advantages I have set before you is demonstrated by the fact that in the past four years the order business of our Association has increased by leaps and bounds and the past season it taxed its officers to the utmost to care for it. The reason is very plain, the buyer, whether he be a retailer or a car-lot distributor, is no longer forced to trust to the judgment of the gower, who for all he knows may be inexperienced in shipping or whose ideas of what constitutes good shipping stock may be entirely at variance with his. As it is, the buyer trusts the inspector who acts as a third party and whose duty it is to keep his grades up to a standard that will command the confidence of the trade.

In this way the buyer's risk has been reduced to a minimum

and he is willing to pay more for inspected stock than he would pay on the street direct to the grower. These are some of the advantages the grower receives by the system of inspection which has been a great benefit to the growers of Sparta, for under it the association has not only been able to obtain for them a greater net profit than ever before but has taken from them a great part of the labor and worry in the marketing of their produce. At the same time the association has constructed and now occupies a new $10,000 building thoroughly equipped for its needs and not only have the officers the fullest confidence of the members but of the trade wherever its product is offered for sale. Successful as inspection at Sparta has proven itself to be, the officers of the association do not feel that they have yet done all possible but are seriously considering the wisdom of instituting what is known as field inspection which will give the Inspector a greater opportunity to examine the stock and instruct the growers in the picking and packing of his product.

Mr. C. L. Richardson: Will Mr. Babcock tell us of what this inspection consists?

Mr. Babcock: It consists of examining stock as it is delivered, and grading it, separating it. We make at Sparta four distinct grades.

Mr. Daub: Have you ever tried field inspection?

Mr. Babcock: Of course inspection as we have practiced it at Sparta has been practiced entirely on the grading plan, but field inspection is an undeveloped quantity as yet. People think it is a good thing and I think that it is coming if not this season, it is sure to come sooner or later.

Mr. Richardson: If a fruit grower comes in with a load of berries, what do you do, do you rip off the covers to inspect the fruit, or what do you do, exactly?

Mr. Babcock: Not without I suspect something. When a grower delivers a load of berries at the platform, I make it a point to take out perhaps the second crate, then perhaps I will let three or four go on, pass them by, then take another crate out, split the cover, examine it, perhaps raise the top of the box and look in, and if I suspect anything, even go so far as to dump the box of berries. Of course my experience in inspect-

ing small fruits has been confined entirely to Sparta, that being the place where I was born and brought up; I know my men.

Mr. Hanchett: The field inspection would be largely for the purpose of instructing growers, helping them in grading, and also in detecting those who are not packing in the right way.

Mr. Babcock: Yes, and it gives the inspector an idea of what that man has, he can see it on the vines and if he knows his business he can tell how that stock will look in the crate before he commences to pick.

Mr. Hanchett: While you are on this subject of inspection, it might be of interest to the strawberry growers here to know what inspection means in the Hood River district. I had the privilege of interviewing some officers of the Hood River Strawberry Growers' Association this fall and I found there the berries were all repacked when they were brought in from the field; they had a force of packers who repacked each box. The berries were emptied out, any overripe berries were thrown out and the fruit repacked in the boxes. It is highly important that no overripe stock goes in, where they travel so far to the market, and of course the freight charges are so high that it does not pay to put any inferior stock on the market, and their inspector holds every box of berries and sees that they are repacked. Whether or not we shall ever get to that here in Wisconsin is a question. If we ever have to reach out to markets as distant at the Hood River growers do, we certainly would be compelled to resort to that kind of inspection. I have no doubt they will be doing that at Bayfield before long.

SMALL FRUITS—PRINCIPLES OF MANAGEMENT.

O. M. TAYLOR, Geneva, N. Y.

A discussion of Small Fruits will not be complete if centered about lists of varieties, distance of planting, cultural treatment, or enemies to be held in check. These subjects are important and some knowledge in regard to them is essential. Yet this information should be combined with a broader knowledge which takes in principles relating to soils and to plants. Back of all this is the human equation—the man—who more than anything else is the controlling factor.

The Small Fruit business is not a small business—it is intensive farming, with methods more exacting than in general agriculture. The greatest results are never secured by half-way measures. Suitable climate, soil, culture, markets are not sufficient. The personality of the man puts its stamp upon the business—it is the mind—directing the operations of fruit growing that effects final results.

Occasional failures or partial losses always occur; yet it is seldom that all the Small Fruits fail in any one season, and for this reason some find a decided advantage in a variety of the fruits that may be grown, such as strawberries, red and black raspberries, blackberries, currants and gooseberries.

Location. Some attention must be paid to the location. Occasionally it is impossible on account of uniformity in type of soil or of slope, to make much selection. It is usually the case, however, that some parts of the farm are better adapted to one fruit than to another. The most suitable location, as a rule, is one sufficiently elevated above adjoining lands as to be free from danger of serious late Spring or early Fall frosts caused by the tendency of cold air to settle in the lowest areas. A slight slope also simplifies questions of drainage, and in addition, permits the planting of varieties most likely to be injured by frost on the higher elevation. The habit of growth of the plant, character of the fruit, distance to which the roots travel, and susceptibility to injury by lack of sufficient moisture should be considered in the selection of the site.

Exposure, or Direction of Slope. The direction of slope influences the temperature of the soil and often has a marked effect on the time of ripening of the fruit—a southerly slope and a light sandy soil tending to hasten maturity, while a northerly slope or a heavier soil tends to retard maturity. This has a bearing upon the market to be supplied—whether early or late.

Preparation of Land—Tillage. Until we understand the importance of tillage this part of the work will too frequently be neglected. Many growers are guided in the number of cultivations by the unsightly appearance of weeds, and in a dry season—which is unfavorable for their growth—cultivation frequently ceases in part or altogether; whereas such a time is the one season of the year during which the greatest good may be secured by frequent cultivations—mostly shallow with Small Fruits, but sufficiently deep to ensure an efficient dust mulch.

It is unnecessary at this time to set forth in full the advantages of tillage. Among the many benefits derived, its relation to the food supply and to the water supply are of most importance. Tillage is one of the cheapest and most efficient agents in setting free unavailable plant food, and in hastening decomposition of organic matter. But of greater importance than this is the relation of tillage to the water supply. An abundance of food without moisture to carry it into solution is of no use to the berry plant; by an inexpensive operation of tillage—not only is the water-holding capacity of the soil increased but evaporation from the surface is checked and the moisture becomes of use to the plant.

The roots of berry plants do not extend far as compared with those of tree fruits and this fact increases the importance of this phase of the subject. The surface soil quickly loses moisture and the shallow root system of the strawberry, the currant and the gooseberry is injured in droughts which have no effect upon the apple or the pear. This question of moisture is always a serious one to the Small Fruit grower. The crop may be carefully nursed for weeks up to the season of maturity of the fruit, and a week of dry weather may reduce the yield from one-quarter to one-half. The crop harvested is largely composed of water. Analyses indicate that the following amounts of water are present in every 100 lbs. of ripe fruit: Strawberries, 90.8 lbs.; raspberries, 81.8 lbs.; blackberries, 88.9 lbs.; currants, 86 lbs.

Of all these fruits the strawberry is most quickly injured by drought—nearly all the roots are within the upper 15 inches of soil—a limited space—and are quickly effected during the fruiting season by a few days of dry weather. The average rainfall is not sufficient to mature the crops without some effort to conserve moisture by cultivation or by mulching. Scarcely a season passes—and 1909 was not an exception—but that one or more of the Small Fruits is reduced in yield from 25 to 75 percent because of lack of moisture. At the Geneva Station the total rainfall during the months of June, July, August and September in 1909, was but 8.64 inches, much too small an amount for normal yields.

Fertilizers. There is no one brand of fertilizer best suited for strawberries, another for raspberries, or for blackberries, or for the other Small Fruits—under all conditions and for all soils. The kind and amount to use depend largely upon the

kind and amount already in the soil. The Geneva Experiment Station is frequently requested to make analysis of a soil and to forward a formula, based on the analysis, most suitable for any one of the Small Fruits. It is possible for the chemist to tell what is in the soil and how much, but he cannot determine how much of this is available to the plant or how rapidly the plant may use such food. Some soils may lack nitrogen—others potash, or phosphoric acid, and many are deficient in humus, or lack of fertility may be due to *unfavorable soil texture* or to *bad drainage,* under which condition fertilizers will be of but little use until a more favorable environment has been secured. One method of determining the kind and amount to use is by trial, leaving check rows for comparison. If the soil responds to phosphoric acid, applications of fertilizers rich in this form of plant food should be made, and so with potash or nitrogen. Possibly a combination of two foods may meet the needs of the soil or perhaps a complete fertilizer may be found most suitable. These fertilizing materials should be applied in such a way as to make comparisons with each other and with checks, to which nothing has been applied. It is more difficult to use cover crops among small fruits than with tree fruits, yet they may at times be used to advantage, and when combined with the use of stable manure may do much to keep up the supply of humus.

Distance of Planting. In general the plants should not be crowded. There should be ample room for each plant to secure its share of food and moisture from the soil, and air and sunlight should not be shut out from the growth above ground. The distance apart of rows and of plants depends on the system of cultivation, character of growth and richness of the soil. Red raspberries may be set closer than black raspberries, six or seven feet by two feet, and blackberries still further apart. Currants and gooseberries 4½ to 6 feet apart, and strawberries the closest of any of the small fruits.

Pruning. The operations of pruning are not so difficult as with tree fruits—yet some attention must be given to this subject. The old canes of raspberries and blackberries are of no further use after the fruit has been harvested. They frequently harbor insects and diseases as well as crowding and shading the new growth. For these reasons the practice is followed among many growers of cutting out and burning the old wood as soon as the fruit has been harvested. The pruning of currants and

gooseberries consists in keeping the head sufficiently open and in removing some of the oldest wood each year after the bushes reach maturity, as the best fruit is secured from the younger wood.

Protection of Plants. The development of the fruit bears a close relationship to the health of the plant. Insects and fungus troubles weaken the plants, and spraying is essential in keeping down currant worms, and in holding the foliage of currants and gooseberries in late Fall. Unfortunately no satisfactory remedies have as yet been found for certain diseases such as orange rust of blackberries or anthracnose of black raspberries, and in such cases prompt measures should be taken to dig and burn infested plants, or to practice a system of frequent plantings of healthy stock, giving the best of care to secure a vigorous and well developed growth.

Winter protection is desirable and even essential with some of the Small Fruits. Strawberries should be covered with some material that will give protection against freezing and thawing, and at the same time not smother the plants. A few tender varieties of raspberries and blackberries must be laid down and be protected with old mulching and soil to avoid serious killing back of the canes.

Selection of Varieties. Environment exerts a strong influence upon both plant and fruit. By environment is meant any or all of the surrounding influences of air or soil that in any way effect the development of the plant. Above all things the plant must be comfortable to do its best, and when for some reason the surroundings are not congenial it will not do so well as in some other locality which has more suitable conditions. Varieties best adapted to one set of conditions may be failures elsewhere. Lists of varieties are almost always unsatisfactory. Only those varieties should be extensively planted that have by actual trial shown their fitness for the location. One of the most valuable places on any small fruit farm is its test plat in which is being grown on a small scale the newer and apparently more promising varieties that have not as yet shown their value. In the selection of varieties some attention must also be given to the market supplied. Varieties suited for one purpose may be useless for something else, and the object in growing must be kept in mind, whether for dessert, canning, local or distant markets or for evaporating. The variety selected should have

those qualities which recommend it most strongly for the special purpose in view. Many of the kinds grown 25 years ago have been discarded and it is to be expected that many of the kinds grown at the present time will be on the retired list in the next quarter century. New varieties are receiving recognition each year. The progressive grower should not hasten to discard his standard varieties for something new and untried, but should be ready to introduce into his test plat those that appear to possess superior merit.

In conclusion it may be somewhat of a disappointment to some persons not to find detailed instructions in regard to the various operations connected with small fruit growing. It must be kept in mind, however, that the details on one farm may be quite different and illy adapted to some other place, yet the suggestions presented at this time apply in all places and under all conditions.

(See discussion, page 122.)

WEDNESDAY MORNING SESSION.

PRESIDENT TOOLE'S ADDRESS.

OUR AIMS AND INFLUENCE

Having occasion to look for horticultural information in some of the early annual reports of our state horticultural society, I was much interested in noting the trend of thought in the state more than thirty years ago.

Then as now our people gave thought to the beautiful in horticultural art, and then more than now the ladies of our society helped to encourage and instruct in the principles of home adornment. All of the various classes of fruit which might be expected to thrive in Wisconsin were being tested, and then as in these days the apple furnished the leading subjects for discussion. At one meeting the late J. C. Plumb stated that during the fifteen years previous to 1855 all of the leading varieties of fruit common to the eastern states flourished here in Wisconsin. Then followed disaster and a close revision of the recommended lists of varieties.

Dr. Hobbins, president of the society in 1870, in his annual

address, advised general planting of hybrid Siberians for home use while varieties of apples were being given a trial.

The society's recommended list of hardy varieties was as follows: Fameuse, Talman Sweet, Golden Russett, Duchess, Red Astrachan. For further trial the following list was given: Sops of Wine, Fall Stripe, St. Lawrence, Fall Orange, Plumb Cider, Perry Russett, Willow Twig, Red Romanite, Blue Pearmain, Seek-no-Further and still others for more extended trial.

Afterwards were the Russian varieties and numerous seedlings for which great hopes have been entertained.

In that early day there was a desire for extensive experimental grounds to be cared for under the direction of the State Horticultural Society. In Secretary Wiley's report for that year, he writes in regard to the proposed, "Horticultural Gardens of the Society." Imagine for a moment a thousand varieties of apples growing there, five hundred of pears, one hundred or more of plums, and as many grapes and strawberries." Since that time, experimental gardens and stations have been established in various states, but I have not learned that anything of the kind has yielded such practical results as our Wisconsin trial orchards are doing.

Courage, industry and perseverance have been characteristic of the men who have labored continuously to establish successful fruit growing in Wisconsin. We are reaping the reward of their efforts.

In those days the fruitmen were asking for a state entomologist. He has been a long time coming and still we need him. They had not then the advantage of spraying which we have. Neither were they so rich in varieties adapted to the needs of our state. The experiences of the past few years indicate that we can grow better fruit and at less cost than that which we have heretofore placed on the market. With the reduced cost and improved quality we are certain of a greatly increased home consumption of apples. Even at the present high prices local demand for home grown apples has been very large.. Since commencing to write this paper I have learned from one neighbor that he has sold in the city of Baraboo and vicinity 300 bushels of apples and still has about 100 bushels to sell. Another has sold in the city and vicinity 480 bushels and a considerable quantity in Prairie du Sac. These quantities must be only a small part of the home grown apples consumed

in and near Baraboo, in addition to what has been shipped in by the merchants from the East.

The program which has been prepared by the secretary indicates that we will learn much of how widely throughout the state successful orchards have been established and that apple growing in the state of Wisconsin is now a profitable industry.

A condensed history of fruit growing in Wisconsin such as might be compiled from the annual reports of our society would be very interesting reading. Such a history would convincingly show how much has been done for Wisconsin horticulture by the society. When the new card index of our annual reports become available, we will realize that a set of these volumes will be a valuable encyclopedia of horticultural information.

In looking over the lists of members, we note how few there are now actively engaged in the work of the society who were members twenty-five years ago. Many are gone, but their work still endures, and the influence of the society yearly increases in value. The influence of the society is as broad and far reaching, as is the meaning of the word Horticulture in its broadest accepted sense. Decoration of home and school grounds, yards and drives, with lawns, trees, shrubs and flowers have all been considered. The most profitable methods of producing the various fruits adapted to our climate have been shown. We have maintained high ideals and thereby broadened and strengthened our influence.

The horticultural interests of the state are now so varied that we need to make our minds familiar with them to the end that a just balance is maintained. An intelligent knowledge by the members of the scope of our society's work, will greatly increase its strength and value. Each member of the society should keep in touch with the executive member of his district, and offer such suggestions as may seem helpful to the society whenever they occur to him. It seems to me that a condensed review of the executive committee's proceedings during the year should be read before the society at each annual meeting, that our members shall have a full knowledge of the working plans of the society.

Our state legislature has generously sustained with liberal appropriations our efforts to promote the horticultural interests of the state. This support has made it possible for our society

to establish horticultural work which will be of inestimable value to the state..

A decided interruption or abandonment of this work would be a great loss to the state, particularly to the development of some of the more recently settled portions of the state. Our state legislature last winter very commendably studied how best to economize in appropriations, when it seemed necessary to them. There were some members of the legislature who did not understand the value of what we are doing and there are many persons throughout the state who are surprised when they learn of the extent and value of the work of our society. Let us make ourselves fully conversant with the scope of our work and make known to the people of the state the good which is being done by the Wisconsin State Horticultural Society.

Mr. G. J. Kellogg. Speaking of old time varieties way back in Dr. Hobbin's time, I recollect that we passed this resolution in regard to varieties. "We recommended five varieties to which there would be no objection, Red Astrachan, Duchess of Oldenberg, Fameuse, Tolman's Sweet and Golden Russet," and those five varieties stand by us today.

REPORT OF SECRETARY,

F. CRANEFIELD.

The year 1910 opens with fairer prospects for the State Horticultural Society and for Wisconsin horticulturalists than has any previous year in our history.

Trial and tribulation marked the early days, failure was the rule, success the exception. Varieties planted with great hopes succumbed to summer heat or winter frosts but with patience and perseverance the pioneers cleared the way for us and brought from Wisconsin soils fruits adapted to Wisconsin conditions.

All of this was done for us by the pioneers in Wisconsin horticulture, who marked clearly and distinctly with danger signs the pitfalls of varieties, winter care and soil needs. Our friends the scientists of the experiment stations have armed us against our enemies of bugdom and disease, the free institutions of America, the limitless opportunities of this most wonderful land on the

face of the earth, has brought forth a population of 90,000,000 people, soon to be 200,000,000 to consume our apples, our cherries, strawberries and all else we grow.

We stand then at the beginning of this year of our Lord 1910 with boundless opportunities before us. It behooves us to take stock of our blessings, to take a cheerful and optimistic view of life.

We can raise as good apples as any state either East or West, we have the best of markets for all we raise, we can produce berries of all kinds including the toothsome cranberry, rains fall alike on the just and the unjust with no necessity for million dollar irrigation canals and spring and autumn frosts touch us but lightly if at all so that the orchard heater is unknown; for all of this and much more than twice all this let us rejoice.

So far as crops for 1909 are concerned the different papers and reports to be presented during this convention will give a better idea than can be given in a report of this kind. In general it may be said that the apple crop was light—probably 50% of a full crop while cherries and plums averaged much higher.

The Orange Judd Farmer estimated the yield of apples in Wisconsin for 1909 at 250,000 bbls. or 750,000 bus. This seemed too high and a little investigation was started from the office of the Secretary. Blanks were sent to all counties where apples are grown and from 59 reports received I am ready to concede that the newspaper estimate was conservative.

Many surprising features developed from these reports and not the least surprising the fact that a very large percentage of our apples is consumed at home. A number of districts, each reporting a production of 3,000 to 5000 bushels, reported none barreled and shipped but all sold on local markets for home consumption. This is probably the most encouraging fact brought out, that we are as yet producing but few more apples than we need at home, the reports showing but 50,700 barrels packed and shipped.

Another interesting fact is shown in the lists of varieties reported; Duchess, Wealthy, Famuese, McMahan and Northwestern appearing in all lists and nearly always in the order given. This would seem to show that the tendency is in the direction of fall varieties. I am well convinced that the future for apple raising in Wisconsin lies in this direction and "Early Apples" should be always our motto.

I have discussed this subject of early varieties so many times in my reports that I hesitate to enlarge on it here except to say that there is little doubt that of the 50,000 barrels of Wisconsin apples marketed last fall every barrel was sold, shipped and 95 per cent consumed by Dec. 1st and most of them before Nov. 1st. If perchance there should be anyone here today who looks with longing eyes toward the irrigated West as the paradise of fruit growers let him ponder on this fact and ask what it means.

If there are yet members who still harbor the delusion that the choicer varieties of winter apples may be grown in this state and point to occasional old trees which still survive as examples I would refer them to the reports of this Society beginning with 1869 and especially the recommended lists of those days; then follow carefully down the years to the present. When this has been done consider very carefully the story as there written; and lest we set too high value on our own knowledge let us not forget that, "there were giants in those days" as well as now.

Men like Plumb, Peffer, Stickney, Tuttle, Hoxie and a host of others were men of sound judgment, courageous and persistent. They finally abandoned the fight for Baldwin, King, Rhode Island Greening and all the others of that class and brought us to the safer and more substantial basis of Wealthy, Duchess and McMahan.

Let us profit by that fifty years of experiment.

Proceeding now from flights of fancy to routine matters it may be said that as members of the Wisconsin State Horticultural Society we also have cause for congratulation.

The Society is today in every way stronger and better than ever before.

MEMBERSHIP.

Our records show a membership of 1,072 of which 140 are life members and 932 annual. This does not include honorary members, the exchange list nor those who are in arrears. The following record is of interest as showing the increased interest in our Society and confidence in our work.

Membership.	Life.	Annual.	Total.
In 1900	25	116	141
1901	25	114	139
1902	31	128	159
1903	36	111	147
1904	43	236	279
1905	63	305	368
1906	86	342	428
1907	101	551	652
1908	121	698	819
1909	140	932	1072

Now that we have safely passed the thousand mark our next standard should be the two thousand mark and that might easily be reached if each member should secure one new member during the year. Your secretary can conceive of no plan more simple nor effective.

Since Nov. 1st, 1909, and to date the following members have secured new members.

Benj. F. Faast, 3 members; Mrs. A. J. Schloerb, 1; Conrad Hoffman, 4; H. J. Bennett, 1; Rev. Hengell, 3; Mr. West, 1; J. N. McLeod, 1; Jos. T. Evenson, 1; Geo. B. Smith, 1; Danford Larkin, 4; J. J. Miles, 4; Dr. Chas. L. Babcock, 1; Geo. Trim, 1; F. W. Harland, 2, (life); Thos. Tollefson, 1; Dan Fisher, 2; Edward Zade, 3; E. W. Sullivan, 3; J. B. Loverin, 2; A. K. Bassett, 1; Andrew Kull, 2; John Spencer, 1; R. S. Wright, 2; J. C. Proctor, 1; G. M. Breakey, 10; Walter A. Conant, 1; O. Knutson, 1.

FINANCES.

The Treasurer's report in addition to showing in detail how the money was expended will also show that we lacked $35.00 on July 1st, 1909, to meet our obligations. Neither the Board of Managers nor the Executive Committee however has seen in this any cause for alarm nor grounds for criticism but feel rather that everyone concerned in the expenditure of our appropriation is to be congratulated on *spending* this money.

The people of this state through the legislature entrusted this fund to us to be spent in the development of horticulture in the state and not start a savings bank. That it should be wisely, carefully and economically expended should be the concern of every member of this society.

LOCAL SOCIETIES.

A resolution passed by the Executive Committee last winter requires every local Society to enroll its entire membership in order to be entitled to a delegate. The following societies have complied with this rule: Barron, Bayfield, Gays Mills, Lake Geneva, Madison, Manitowoc, Oshkkosh, Poysippi, Algoma.

A few of the locals are active and worthy of the name of auxiliary societies, the others are merely social organizations or else meet but once a year in order to maintain their name.

Of the first class the Lake Geneva Society is an example. This society holds regular monthly meetings which are well attended, and an annual exhibition. In point of interest and amount of work done the Lake Geneva Society easily leads and this is because gardening is the sole and only occupation and interest of the members.

Other societies which exert an influence on their respective communities are Bayfield, Manitowoc and Oshkosh.

In order that a local society should be a success there must be back of it a strong "dollars and cents" interest, enough people in that particular locality who can see some material benefit to be derived from membership and attendance. Either this or else there must be at least one person in the community who will give of his time and energy early and late to maintain life and interest in the organization, for we have not as yet advanced to that point found in the older communities of the eastern states and European countries where asthetic horticulture, pure art, has followers sufficient to attract and hold together a local art or improvement association.

Not infrequently has the Secretary bee reminded that he was lax in his duty respecting local societies, that therein lay in a large measure the strength of the State Society. All this is admittedly true where these locals have enough local interest behind them to survive when once organized but to expend good money and no little time and energy in bringing to life a local society to see it die within a year is but cold comfort.

SUMMER MEETING.

The Summer Meeting was held in La Crosse, Aug. 25th.

STATE FAIR EXHIBIT.

The exhibit the past year was on entirely new lines comprising an extensive exhibit of spraying machinery and materials and was in every respect a success. On a platform alongside the horticultural building was shown every size, shape and type of spray pump made, from the tiny atomizer for house plants, knapsack and bucket pumps, 8 kinds of barrel pumps, to the complete gasoline operated outfit.

In a tent in the rear of this exhibit the "poison squad" representing seven firms manufacturing arsenate of lead, paris green and lime sulphur put up attractive exhibits.

The thanks of the society is due to all of the firms which helped to make up this most excellent educational exhibit. Following is a list of the different firms which exhibited:

Wallace Machinery Co., Champaign, Ill.

Complete gasoline-operated outfit on truck. Automatic (geared) outfit on truck.

F. E. Myer & Bro., Ashland, Ohio.

Two Hand Pumps mounted on barrel.

The Field Force Pump Co., Elmira, N. Y.

Hand Pump on barrel.

Morrill & Morley, Benton Harbor, Mich.

Two Hand Pumps, one on barrel, one on cart.

E. C. Brown Co., Rochester, N Y.

Hand Pump on barrel. Auto spray.

Stahl Sprayer Co., Quincy, Ill.

Hand Pump on barrel.

The Deming Co., Salem, O.

Hand Pump on barrel. Knapsack Pump. Bucket Pump. Atomizers.

The Niagara Gas Sprayer Co., Middleport, N. Y.

Gas Sprayer.

Insecticides and Fungicides. Extensive displays by

The Bowker Co., Boston, Mass.

Hammonds Slug Shot Works, Fishkill-on-Hudson, N. Y.

Sherwin & Williams Co., Pullman Sta., Chicago, Ill.

Grasselli Chemical Co., Cleveland, O. and Milwaukee.

"Target Brand" American Hort. Distributing Co., Martinsburg, W. Va.

Merrimac Chemical Co., Boston, Mass.

COUNTY FAIRS.

Judges appointed by this Society served at 31 County Fairs in 1909 and, in every case reported, with entire satisfaction. It is doubtful if there is any other way in which we can expend $350.00 ,the approximate cost of the work, to better advantage.

FARM INSTITUTES.

The work has been continued along the same lines as in the past two years and our representative D. E. Bingham is again in the field expounding the gospels of tillage and spraying.

SCHOOL GROUNDS IMPROVEMENT.

A new line of work was inaugurated during the past year, the improvement of the rural school grounds of Wisconsin. At the Jan. 1909 meeting of the Executive Committee the sum of $500.00 was appropriated for this work and following a plan outlined by the committee four schools were selected for improvement as follows: Branch, Manitowoc Co.; Sevastapol, Door Co.; South Lancaster, Grant Co.; Lyons, Sauk Co.

In each case trees and shrubs were planted after plans furnished by the Horticultural Dept. of the Agricultural College.

By the terms of a contract executed in each case the Society furnished the plan and material for planting as well as cost of superintendence, free, the school board assigning to the Society the control of the grounds so far as tree planting or renewal of trees and plants is concerned for a period of ten years.

These schools and others which may be selected are to be used as object lessons or demonstration centers in the same way as our demonstration orchards. The plan is comprehensive and if in ten years we are able of accomplish as much toward the beautification of the school grounds of Wisconsin as we have in fruit work by our trial orchards, we will have cause for gratification; if ten or twenty years hence the rural schools of Wisconsin shall have changed in aspect from the utter neglect and desolation which now characterizes so many of them, to brighter, cleaner and more cheerful surroundings, the members of this Society may have a just cause for pride in knowing that the work was started by this organization.

BULLETINS.

Two bulletins were issued during the year as follows:

No. 15. Spraying, 32 pages, 17 illustrations, 2,500 copies.

No. 16. The Oyster Shell Bark Louse, 12 pages, 1 illustration, 1,500 copies.

During the year over 5,000 letters and 25,000 circulars in addition to bulletins were mailed from the office of the secretary. A very large number of the letters were in answer to questions from members and others who have troubles. No question has remained unanswered.

So much for the past year, one of encouragement and progress; what of the coming years? As a rule prophecy is an unprofitable and thankless task but with the experience of fifty years back of us we are, perhaps, justified in using that past as a basis for judging of future developments.

We have accumulated a vast and a valuable fund of experience in that time; we know now what we can raise and what we cannot raise; we know better where fruit may be grown in the state and where it cannot be grown profitably; we know *how* to raise fruit, how to cultivate, how to spray and how to prune.

We are then fully equipped and with our knowledge and resources should make a tremendous advance within the next ten years in commercial fruit raising.

Wisconsin within ten years should produce more fruit than is now produced in Michigan or Illinois. Within ten years our production of apples should rise from the 250,000 barrels of 1909 to 2,500,000 barrels in 1920 with cherries a close second. Strawberries and bush fruits should increase in like proportion.

All of this and "much more than twice all this" can be done if we set about it. Wisconsin offers the opportunities, we need only faith, abundant, abiding faith and we *must* succeed.

For those who doubt that fruit raising can be made profitable the followng reports for 1909 are given for the purpose of strengthening their faith.

APPLES.

Richland County.

1¼ Acres Wealthy, 130 bbls. @ $4.50 a barrel, $585.00.

7 Acres, 5 varieties, 450 bbls. @ $4.50 or $2,250.00.

Sauk County.

30 trees, Fameuse, net return $220.50.

14 trees, McMahan, net return $91.00.

Marathon County.

1 Patten Greening tree Wausau orchard 14½ bus. @ $1.00 per bu. $14.50.

CHERRIES.

Door County.

8 Acres, 700 trees, 3,529 cases @ $1.15 or $4,058.35.

600 trees, 3,449 cases @ $1.15 or $3,966.00.

300 trees, 1,750 cases @ $1.15 or $2,012.50 trees all twelve years old.

STRAWBERRIES.

Sparta.

1 Acre, 500 cases @ $1.15 or $575.00.

Average of 500 acres $172.00 per acre.

These are not *quite* up to the figures from the irrigated and smudge pot regions of the West but neither is the investment so great.

A prospectus of one of these western development companies offers land at $450.00 per acre. For this sum the company agrees to furnish 80 trees per acre, plant and cultivate for a period of 5 years.

The same thing can be done in Wisconsin in a dozen different counties for less than $150.00 per acre including cost of land and assuming cash to be paid for all labor.

The owner of 80 to 100 acres of farm land can plant 20 to 40 acres of orchard on this farm and by judicious cropping and manuring bring it to profitable bearing without a cent of expense beyond original cost of trees. The orchard should begin bearing at 6 years and the crop the tenth year should pay for the entire investment, land, trees and labor to date.

These statements are not simply wild guesses but are founded on estimates submitted by five of the best informed fruit growers in the state.

I have here outlined in this rambling way the activities of the society for the past year and having thus fulfilled my duty to you I should rightfully close that you might take up other matters of more importance and interest but I

cannot refrain from expressing to the officers of the society, the members of the Executive Committee and not least of all to the membership body my sincere, heartfelt thanks for the courtesies and kindly feeling throughout the year.

The path of the Secretry is not always strewn with roses.. Not seldom does his duty lead over new and untried ways that must be cleared of obstructions. Not always does the Society bask in the sunshine of legislative grace for occasionally as during the last session, our law makers, actuated by a sense of misdirected economy sought to reduce our appropriation. It is at such times as these that your secretary feels most keenly the poverty of human speech, first to express properly an opinion of legislators who are so prompted and again to express to you, fellow members of the State Horticultural Society, something of the overwhelming sense of gratitude for the loyalty of the officers and members of this Society.

With this spirit of loyalty we cannot but win the respect of all the people of the state, we cannot but augment our strength and usefulness until we rank in numbers as we now rank in strength and usefulness the most influential factor in shaping the destinies of horticulture in Wisconsin.

REPORT OF SUPERINTENDENT OF FIELD WORK FOR 1909.

F. CRANEFIELD.

The trial and demonstration orchards, 10 in number, may all be reported as in good condition. As it is unlikely that the members will be interested in hearing of the number of trees which died and have been replaced, the number of times each orchard was cultivated, etc. ,such details will be omitted from this report and remain on record in the office of the Secretary. I offer instead a brief outline of the progress of the work at the different places.

POPLAR: The tile drains work perfectly and trees show marked improvement. The variety list grows smaller and smaller with each succeeding season; the following kinds having entirely disappeared: Newell, Fameuse, McMahan, Golden Russett, Tolman, Plumb Cider, Astrachan, Ben Davis, Pewaukee, Fall

Orange, Seek-no-Further, Utter, Scott Winter, McIntosh, Willow Twig, Lily and most of the Longfield and Northwestern.

The varieties which persist and thrive are, Duchess, Wealthy, Hibernal, Patten Greening, Okabena, Malinda and all of the crabs including Briar, Sweet Russett, Martha and Hyslop.

I am inclined to believe that our variety testing at Poplar has been fairly well done, that we need carry it no further and that the list just given comprises about all in apples that may be grown in the Superior Red Clay region.

MAPLE: The orchard is doing as well as can be expected with the intermittent care it receives. This is the faul of the Superintendent and resident manager jointly. It is too early to give any conclusions or to form any comparisons between this and Poplar.

BARRON: The Poplar story is being retold at Barron. McMahan, Wolf River, Northwestern, Longfield, Fameuse, Tolman, Utter and McIntosh are rapidly disappearing while Duchess, Wealthy, Patten and Hibernal are thrifty.

Much yet remains to be told at Barron.

MEDFORD: A change of contract at Medford has exerted a marked influence on the orchard. With more thorough cultivation the orchard has improved wonderfully and we may soon expect to get returns from this orchard.

STURGEON BAY: This orchard leased Jan., 1908, for years has fulfilled all of our expectations. The entire expense for pruning, cultivation, etc., for the season amounted to but $44.50, rent $45.00 making in all $89.50.

The crop brought $312.48 net the entire expense of picking, packing, barrels, freight and commission being deducted. This leaves a clear profit of $223.00 for the year 1909; deducting from this the rent and care for 1908, when we had no income whatever there still remains a net gain of $113.25 on this little piece of rented orchard and now that we have the orchard in good working shape the returns should increase rapidly. I estimate that the Society will clear $1,000.00 on this transaction by the time our lease expires in 1914, or quite enough to buy the land.

WAUSAU: Nothing can show more clearly the rapid development of this great state of Wisconsin than the history of our trial orchard at Wausau.

When this orchard was established in 1897 several of our members and many more outside of the Society considered it a

piece of rank foolishness as the idea of raising apples as far north as Wausau seemed too ridiculous for serious consideration.

We have now proved beyond any doubt whatever that good apples can be grown profitably in Marathon County. I might give you in detail the history of this orchard since 1904, and write at length about the splendid crops of fruit in 1905–7–9 but in the end nothing more would be told than as stated "We have proved beyond any doubt whatever that good apples can be grown profitably in Marathon County." The full significance of this can only be realized by those who know the extent of the wonderful "cut-over" and hardwood regions of Central Wisconsin. There are millions of acres of land in Central Wisconsin as good or better orchard land than that on which the Wausau orchard is located. The story of the 1909 crop in this orchard will be given in full by Mr. Marsh who purchased and handled the crop. When you learn from his report of the interest shown by the people of Central Wisconsin I have no doubt you will agree with me that the Wausau orchard has been worth many times its cost.

GAYS MILLS AND MANITOWOC: Of these two orchards there is but little to be said at this time. The losses were very slight the past season, all trees made a thrifty growth and the orchards are promising in every particular.

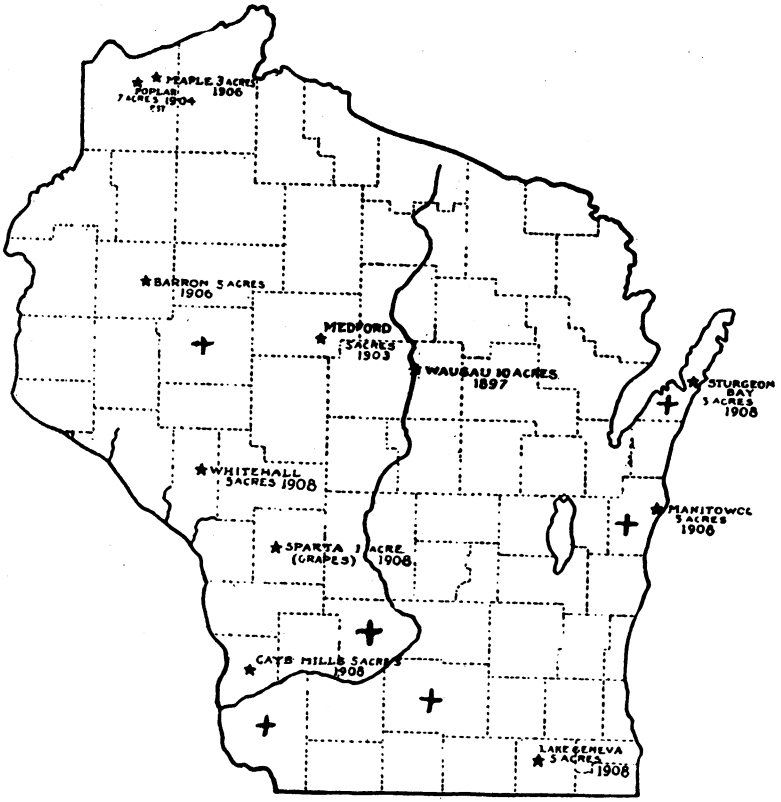
One acre of grapes was added to the Gays Mills plantation last spring. The following varieties were planted: Moores Early, Concord, Worden, Brighton and Niagara.

SPARTA: We have not met with any startling degree of success so far in the Sparta vineyard but we hope for better results in the future. Owing to a combination of unfavorable circumstances it was necessary to renew nearly one-half of the plantation last season and considerable of the new setting failed to start this year. A portion of the vines should bear next year and one or two years hence we should be marketing grapes from Sparta.

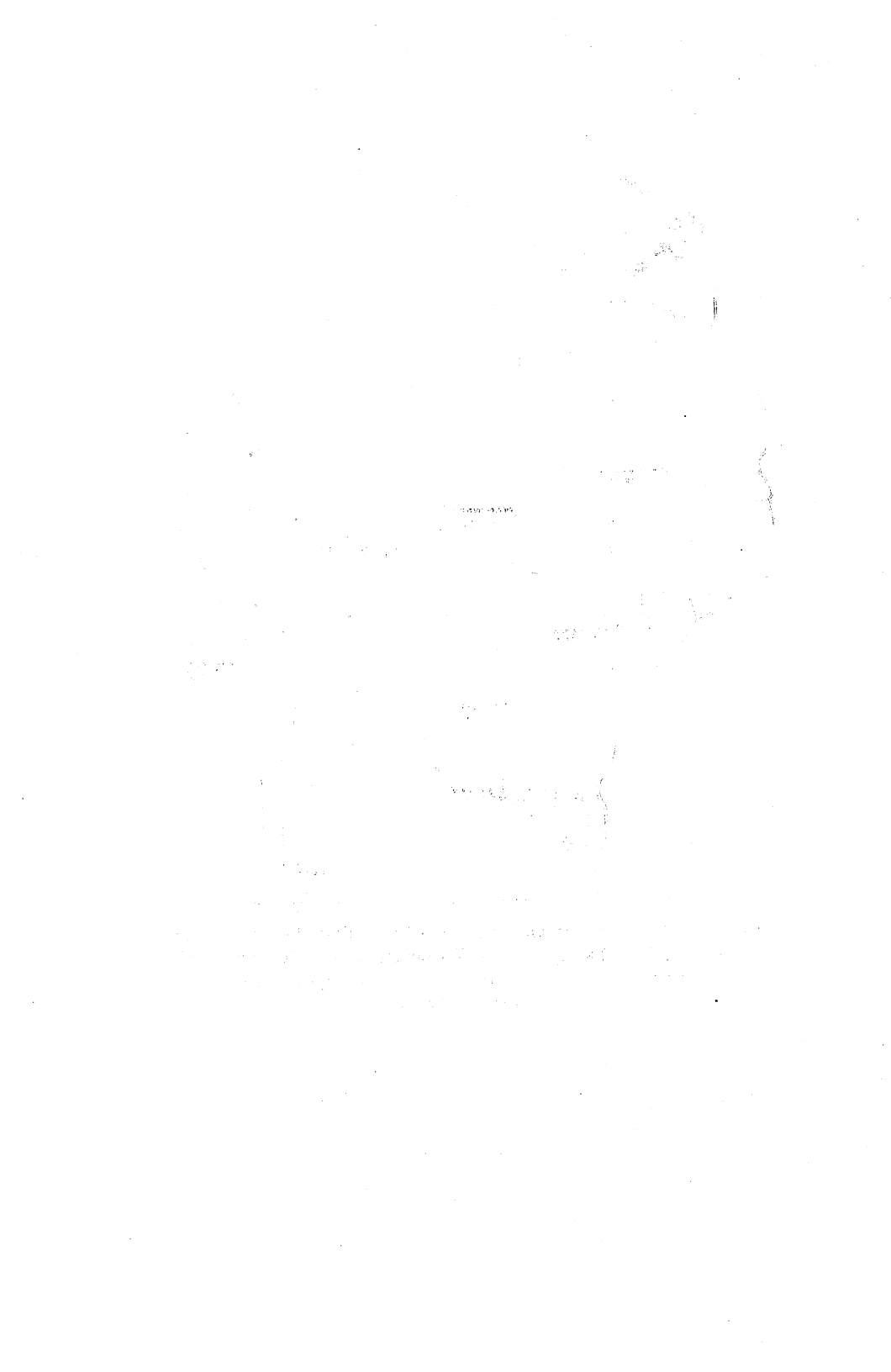
NEW ORCHARDS.

WHITEHALL: Two new orchards were located in the summer of 1908 by the Trial Orchard Committee. One of these is on the farm of the County Insane Asylum about 2 miles from Whitehall, the county seat of Trempealeau County.

The orchard comprises five acres and was planted May 7th, 1909, one acre each of the following varieties: McMahan, Oka-



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 improved in 1909, indicated by +



bena, Hibernal, Wealthy and Duchess, set 24x24 ft. or 75 to the acre. The McMahan and Okabena stock from the Jewell Nursery, Lake City, Minn., the remainder from Great Northern Nurseries, Baraboo, Wis.

LAKE GENEVA: This orchard is located on the farm of Hobart M. Hatch about four miles east of the city of Lake Geneva. The orchard consists of one acre each of the following kinds: McMahan, Fameuse, Tolman Sweet, Wealthy and Duchess. Trees set 24x24 ft., 75 per acre. Planted May, 6th, 1909.

REPORT OF CHAIRMAN OF TRIAL ORCHARD COMMITTEE.

D. E. BINGHAM, Sturgeon Bay.

The Committee on Trial Orchards with the exception of Mr. Coe started on our annual tour of inspection Aug. 8th. The first orchard visited was Barron.

The condition of the different varieties there was about as follows: Duchess fairly good, some winter killing, blight, etc.; Wolf River and N. W. Greening about the same as Duchess; Tolman, Windsor and Lowland bad condition; Wealthy good; Fameuse fair; Hibernal good; Dudley good; Zettle and Lily good; Patten fair. Plums very good; cherries fair. New (1908) planting fairly good except all show slight winter injury in wood, which may be outgrown in time.

MAPLE: Here we found the following: N. W. Greening no good; Scott N. G.; Transparent good; Longfield, Iowa Beauty fair; Tolman poor; Utter good; Patten good. All new planting good.

POPLAR: Wealthy and Duchess good; Longfield and Newell poor; Fameuse poor; McMahan good; Transcendent good; Hyslop good, one blighted very bad; Malinda poor; Pattens poor; Okabena good; Plums look good. Some plums and a few apples. Cherries were looking as though they didn't care much. It was raining and the red clay in this orchard makes it exceptionally fine getting around in wet weather. No danger getting up too much speed in the orchard. I don't anticipate much trouble from the boys in this orchard in wet weather as long as orchard is cultivated. In a drizzly rain we looked over this orchard and

left for the next place which took us till about 12:20 that night to reach.

MEDFORD: This orchard at Medford is in excellent shape as far as appearance goes. Mr. Harris has it looking like a garden and a well kept one, too, but the trees show some weak points. Uneven in size, etc., but as a whole this orchard looks good. A few bushels of apples on the trees. From here we went to the Wausau orchard and found everything looking good. Good crop on most varieties and with the exception of a few weak trees the orchard looks fine. Your Committee arrived at Wausau 3:40 P. M. and drove to orchard, walked up and down the rows with pencil and paper and estimated the crop and got back to hotel for late supper, then worked till 11:15 on the orchard proposition that was before us, then left for Manitowoc.

MANITOWOC: This orchard is located in a different country and a blind man could almost see the difference in the orchards. You will find at Manitowoc every tree in its place and looking as though it would stay there. These trees were in bad shape when planted and it will take a few summers to remedy the mistake of the nursery man that grew the tree but it can be done at that place but perhaps not at any of the other places would it be safe to try it. We found everything looking good at Manitowoc, so we left as soon as possible for Sturgeon Bay.

The orchard at Sturgeon Bay showed quite a little fruit and trees looked good. Report of Secretary will show up the results of this orchard.

THE 1909 CROP IN THE WAUSAU TRIAL ORCHARD.

W. H. MARSH, Antigo.

I wish to submit the following report on the trial orchard at Wausau, Wis.

On August 3rd, I visited the trial orchard at Wausau and certainly found a pleasant surprise awaiting me, for it was the best showing of clean, bright, healthy fruit that it had ever been my privilege to inspect.

I found the orchard in a semi-cultivated condition, as about a 10 foot strip had been left in sod; balance in clean cultivation. The pruning was well done but I think much more wood left than was good for the fruit, or health and life of

Harvesting Northwestern Greening, Wausau Trial Orchard, 1909.

trees. I consider pruning fully as important as spraying. The spraying was very thoroughly done and showed marked results, it certainly was a strong object lesson for there was not one bu. of wormy or spotted apples in 2,200 bu. and right here I wish to state that the 6⅓ acres of the apple portion of the Wausau orchard where the 2,200 bu. were picked possibly is one of the best showings of high grade and fancy fruit from same acreage in the history of our state.

The cherry portion of orchard was a failure this year as an acre of 13 yr. old trees produced only fruit enough for two cherry pies.

The plum portion of the orchard was not a commercial success as there were only 7 bu. on an acre of 13 yr. old trees, so will confine report to the 6⅓ acres of apple orchard of producing size and age and mostly 12 yrs. old.

I placed my bid for the fruit in the orchard about Aug. 10th, in competition with several others and was fortunate enough to have my bid accepted. I say fortunate as I had a three-fold object in view and was reasonably successful in all.

1st, the financial side, which while it was not large, was very satisfactory.

2nd, I was very desirous to learn what was possible to do with our standard and new varieties by allowing them full time to ripen and develop. This was certainly a revelation to me as well as to the many visitors. Many of our trees were loaded with large, well ripened, fully developed, highly colored, spicy flavored fruit, such as would line up well with the fruit belts from either east or west.

3rd, and last but not least, we wished to create an interest among the people of central Wisconsin along lines of fruit culture and in this we succeeded grandly, as fully 3,500 people visited the orchard in Sept. and Oct. Fully 200 acres of orchard will be set the coming spring encouraged by the demonstration of the Wausau orchard. Business men of Wausau and vicinity stated that the demonstration of what was possible to do in apple culture on some of our cheap or medium priced lands had a commercial value of $15,000.00 to $20,000.00 to Marathon County alone. It certainly is the highest possible type of development of our farm lands.

The orchard is divided into two parts, the commercial and

the experimental side. The commercial side contains about 20 varieties and the experimental side 55 varieties. There were 63 varieties that bore fruit and most of them made a very good showing.

I took possession of orchard Aug. 17th, and picked the Tetofsky the same day. I consider the Tetofsky one of our best first early apples. It is hardy, an early and prolific bearer and a very good eating apple. I think it better than the Yellow Transparent as it is a better shipper and does not blight. Sold readily at $1.00 per bu. in bushel baskets.

Lubsk Queen: There were three trees of the Lubsk Queen that made a fine showing of handsome fruit but of low quality, color pure white and bright pink of waxy appearance, quality much the same as some western apples from irrigated districts. Sold at $1.00 per bu. on its good looks.

Duchess: Commenced picking Duchess about Aug. 25th. They made a fine showing. Picked trees five times over and was well paid as I secured all fancy fruit of good size. Sold from 60c to $1.00 in bu. baskets.

The Sweet Russett: Crab for the girl's apple. Whitney No. 20 crab for the boy's apple. No orchard is complete without these two varieties as they can be used in so many ways. They are hardy, early, annual and prolific bearers. Good market at $1.00 to $1.25 per bu.

Morris:. This variety we have heard very little of but made a fine showing, is a fine dessert apple and comes at a time when eaters are scarce. It is medium size, dark red striped and very good quality, sold readily at $1.00.

Okabena: The Okabena over-bore, so much of fruit was small and fell badly, is a very fair eating or cooking apple but should be thinned to make a good showing. Sold from 25c to $1.00 per bu. according to size.

Dudley: The Dudley did itself proud and I predict that within five years it is going to set a $2.50 to $3.00 per bu. box pace that will let the western boomers know that Wisconsin is on the map and is there to stay. The Dudley is very large, good shape, bright crimson stripe, quality the best, sure to win out as a fall dessert apple. Sold readily at $1.50 and should have brought $2.00 per bu. at orchard this season.

Iowa Beauty: The Iowa Beauty made a fine showing, is a large, well shaped apple, high colored and a good dessert apple,

This McMahon tree, in the Wausau orchard, planted in 1897, has borne three full and two light crops in the past five years. A companion tree bore 14 bushels in 1909.

Eight McMahan apples and one peach. Wausau orchard, Oct., 1909.

but not a long keeper, comes to its best forepart of Oct. Good seller.

Peerless: The Peerless has not received much attention or consideration in this part of the state, but was an attraction this season and proved itself worthy. It was the most uniform in size of any apple in orchard. Nearly every apple fancy, very desirable as a box apple, is very good size and shape and high crimson color and excellent as a dessert apple. I think it is worthy of a place. Sold readily at $1.25 per bu. and $3.50 to $3.75 per bbl. Would easily have brought $2.00 to $2.75 in bu. boxes this season on city markets.

Wealthy: The Wealthy is a wide-awake business apple of great value but much abused. It is allowed to overbear and seldom left on trees long enough to come to full development. If allowed to take true color and ripen would readily bring $1.75 to $2.00 per bu box. Sold some at $1.50 this season at orchard in baskets.

McMahan White: This great commercial apple did itself proud this season. Picked as high as 14 bu. from 13 yr. old tree, 95% fancy and sold at $1.00 to $1.50 per bu. and $3.50 to $4.00 per bbl. On account of fine juicy texture, is an ideal cooking apple and a very fair eater. Is a large white apple with pink blush and transparent waxy appearance. They would grade so as to make a fancy box apple for any market. A commercial orchard should contain 20% McMahan White if packed in boxes.

Patten Greening: Only part of the Patten Greening bore this year but those that produced made an excellent showing. Picked as high as 14½ bu. from a single tree. They are large, light green with a crimson blush, a very showy apple of good quality, an excellent cooker and very good eater. Sold readily at $1.25 per bu. and $3.50 to $3.75 per bbl.

Utters' Red: The Utters bore a good crop of fancy fruit, was good size and well colored. As it has a very spicy flavor it is a desirable dessert apple. Was one of our good sellers, $1.00 to $1.25 per bu. $3.50 per bbl.

Seek-No-Further: The Seek-no-furthers bore a heavy crop of high colored fancy fruit of excellent quality. On account of size, quality and color it would make a desirable box apple. Sold readily at $1.25 per bu. and $3.50 per bbl.

Wolf River: The Wolf River on account of poor quality has

had hard lines to make and keep friends but it certainly did itself proud this season. Fruit was very large and well colored so was one of the attractive spots of the orchards. Sold readily at $1.25 to $1.50. The Wolf River if left until ripe on trees, then placed in cool cellar until about Jan. 1st is not a bad apple to bake. It will prove itself better than some of the western fruits if given a place.

Malinda: The Malinda is a good annual bearer, small but a handsome pear shaped apple, yellow skin and crimson blush, almost sweet, quality fair, not very juicy. It is hardy and very desirable on account of its excellent keeping qualities. March to April.

Avista: The Avista made a very fair showing this season of medium sized fruit, color dark green and slightly striped, very good quality. Is desirable as a good keeper. March to April.

Hibernal: The Hibernal bore a very heavy crop of ill-shaped fruit. I consider it one of the least desirable of any tried out in orchard. They are about size and shape of the Duchess but of poorer shape and quality. Sold at about ½ price of other standard varieties. 50c to 75c per bu. In bbls. they do not keep well as they develop small black spots in ripening. Very hardy.

Longfield: Small but sound, 75c to $1.00 per bu.

Wendorff: Is a Marathon Co. product. Tree bore a heavy crop of very handsome fruit. It is a large, shapely apple of transparent yellow and red blush and very good quality as a cooking or desert apple. November to December. A good seller.

Newell & Dominion Winter both made good showings and fruit sold very readily at an average price.

Eureka certainly is an apple worthy of note and is one of our best types of sweet apples. It is a heavy bearer of the cluster type, a good sized fruit, green with red stripes, a sweet apple of quality and a good keeper.

Alma is also a good sweet apple but smaller in size and not the quality of the Eureka but a good keeper.

Milwaukee made a good showing of fruit, fair quality, color green skin and red stripes. A good keeper.

Virginia Crab did itself proud, fruit large and very high color. On account of its high color, excellent keeping qualities and free from blight, I consider it superior to our old faithful,

the Transcendent. It matures about one month later than the Transcendent. It is very hardy, strong and rapid grower and one of our best trees to top work. Sold readily at $1.00 per bu. at orchard.

N. W. Greening. Last but not least the N. W. Greening. This grand old apple has not been fully appreciated as no home garden or commercial orchard is complete without the N. W. Greening. While it is not a high quality apple it is a good cooker and fair eater, when it is allowed to ripen off in a cool cellar and will compare well with others on market at that time and better than most of them. Will keep until April or May. It is a large, light green fruit, with a red blush and very uniform in shape. Sold readily at good prices. Give the N. W. Greening a chance in either home or commercial orchards.

I wish to state in closing that I visited the land show in Chicago and saw the crack display by the Hood River Valley Association and while it was a very fine display, the Wausau orchard could have made an exhibit of Wealthy, McMahan White, N. W. Greening and Wolf River just as uniform in size, of a larger type and superior in quality to those shown by our western boomers.

Our 1910 Motto: Fancy Wisconsin Apples selling readily at $2.50 per bu. box.

The President: I notice Mr. Marsh gave two lists, one of those looked on as commercial varieties and the other as experimental. I take it for granted that the Dudley at that time was classed as experimental, and he would now remove it from the experimental to commercial.

Mr. Marsh: The Dudley would go as a commercial apple, I did not put it among the experimental.

GARDEN OF EDEN.

G. W. REIGLE, Madison.

I must confess that I never approached any report with more anticipated pleasure than I have in the preparation of this report, the facts for which were obtained during my journey to Eau Claire and Chippewa Counties in the early days of October last.

Old-fashioned honesty constrains me to acknowledge the courtesy and the interest manifested by the little Dutch Giant of the Chippewa, the Hon. C. H. Daub of the 2nd Eau Claire Assembly district. He it was who urged upon your representative the hospitality of a well-appointed and cultured home where every known food grown in the torrid and temperate zones graced and burdened the banquet board, where for the time being his amiable wife and family became as it were a bodyguard for my safety and comfort.

He it was who made it possible for me to visit about twenty farms with orchards in the short space of two days.

You should also know why this trip was undertaken so you may judge whether our investigation was a legitimate expenditure of public money.

At six o'clock P. M. Sept. 29th, Secretary Cranefield telephoned me to meet him at the North-Western Ry. station, saying he had an important message for me. The message was that he had received discouraging reports announcing the ruinous prices at which choice Duchess and Wealthy apples were selling at in the cities of Eau Claire and Chippewa Falls.

He said that he considered it his duty and the express business of this society to investigate the report and if found to be true, to inaugurate measures which should result in furnishing to the growers a remunerative market elsewhere and informed me that I must go for he could not. Accordingly at six o'clock the next morning I was well started on my way toward an undiscovered garden of Eden.

On investigation I found that from Sept. 30th to Oct. 3rd, inclusive, good apples in the city of Eau Claire were retailing from the stores at from 30 cents per peck to 45 cents per peck.

The price to the growers for the same apples was not less

than $1.00 per bushel nor more than $1.15 per bushel. I learned that choice Duchess had not been sold for less than 75c per bushel, Eau Claire market, that the common run of Duchess had sold as low as 65c per bushel.

Looking northwest from Eau Claire across the flood plains of the river a distance of three or four miles one may plainly see the Eau Claire Asylum, about one mile nearer the city lies the farm of Mr. Andrew Moholt who has ten acres of bearing orchard and twenty-five acres of recent planting. The location is on the first terrace above the river valley in what I would call an exposed position on ridges whose slopes face the east and north.

The chief varieties grown in this orchard are the N. W. Greening, Patten, Yellow Transparent, Duchess, Tetofski, Whitney No. 20, Wealthy and Wolf River. Up to this time, Mr. Moholt needs but little advice from anybody on the subject of how to grow apples profitably in Wisconsin. Mr. H. A. Donaldson has a small but very promising orchard of sixty trees bearing fruit high in color, above normal in size and free from scab and worms. Mr. T. S. Lee's two acre orchard is perhaps, all features considered, the most profitable small orchrad visited in Eau Claire county. Here I found N. W. Greening, Fameuse, Scott's Winter, Wealthy and Wolf River. To my mind the points of superiority were, uniformity in size, their wonderful coloring, and their unusual size and an added charm I cannot describe. Mr. Lee told me that the profits of this small orchard paid all the current yearly expenses for operating his farm. Mr. Lee's methods of picking and marketing his apples for local trade can hardly be improved. He gathers his apples in baskets or in bushel crates where they remain until they are sold to the consumer, empty packages being exchanged for those filled with fruit after the usual fashion with strawberries.

This method, you see, obviates repeated handling and the consequent bruising of the fruit.

The orchard of Hans Johnson is located on the north slope of a very steep hillside being sadly neglected of late years. Through the center of this orchard are two long rows of bearing but nearly worthless seedlings, sold to Mr. Johnson for Wealthy and Duchess. The Hyslop crab growing on this hillside were nearly as large as the normal Whitney No. 20, not a worm, no curculio.

Following are the names of some of the men whose orchards are variable in size, none of which differ materially in their general characteristics, all bringing their owners a fair return for the capital invested:

William Wilson, J. M. Vance, August Alf, Charles Wiese, W. H. Aude, Richard Wolf and John Eggers and Chas. Stei.

Just outside the city limits north of Eau Claire lies a small farm the development of which deserves brief special mention.

Fifteen years ago this farm was a wilderness of sand covered with scanty grass, scrub-oak and jack-pine. To-day the owner who had formerly been a lumber jack, and without farm-life experience purchased this land because it was all he could pay for.

Fifteen years of privation and hard labor by himself and family have resulted in comfortable farm buildings; eighty acres under cultivation, 400 apple trees growing, 50 of these bearing, an abundant harvest of choice fruit; a fine grove of the cultivated Americana plum which bore well, the fruit bringing 6c per qt. in the market.

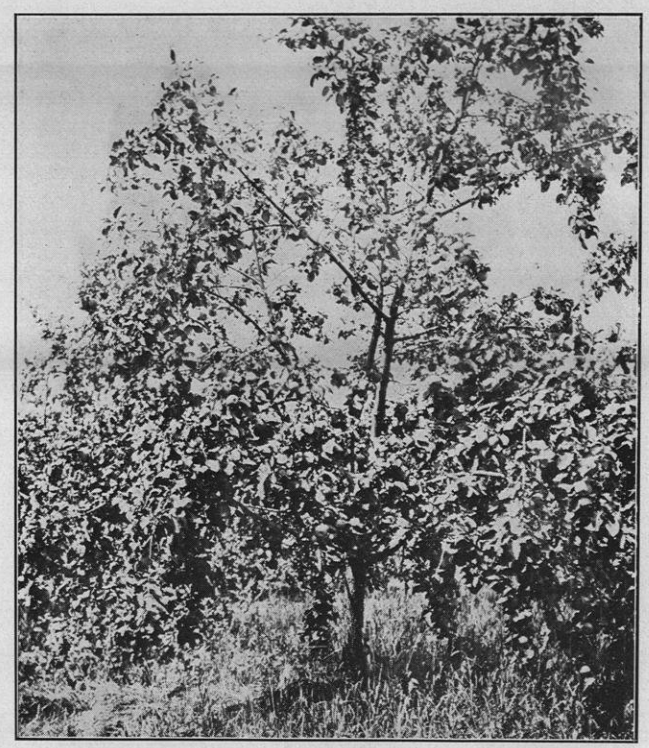
Besides this I noted an acre of strawberries; one-half acre of cabbage and two acres of blackberries; a span of horses, a cow and two lively boys who had already proved how capable they were by capturing premiums in a corn contest at the Eau Claire County Fair.

The nucleus of this garden of Eden has been adequately described by my friend Mr. Melville. I verily believe, if Adam and Eve were actually driven out of the garden, that the imposed expulsion was merely a period of probation which should end as soon as the twain should be able to raise Wealthy apples of their own successfully.

Certain it is, that the cycle of purgatory is now complete and that the descendants of our first parents have returned to the garden and no snake to this day has appeared in any real apple garden in Wisconsin.

The prospect for Wisconsin apple growing brightens. In nearly every instance apple growing is pursued in conjunction with diversified farming; a wise procedure for any person who has not fully decided what branch of agriculture he is best equipped for.

There exists almost everywhere in this state an undercurrent of distrust begetting indifference toward the apple orchard. Evidently this element of distrust is not confined to Wisconsin



Malinda tree, Wausau Orchard, 1909.

but actually exists in Canada, Penn., Mich., and New York. With the exception of the Pacific states and possibly Missouri and Arkansas, there is no concerted movement toward making the apple crop the main crop.

In the orchard named above there had been no spraying for rot, blight or the codling moth; no clean cultivation; trees growing in sod with more or less rubbish, straw, etc., for a mulch; an indifferent and careless method of handling the fruit and yet we who live in the wormy belt are confused by the marvelous results attained where our so-called modern treatment of orchards is wholly ignored.

In these counties singled out for special consideration and in nearly every other county of our state the expansion of the apple orchard is an assured fact.

This progressive movement our Society hails with delight for we are positive that no man who will use ordinary judgment in selecting fertile ridges with limestone as the basic rock and who will post himself regarding the varieties of apples to plant and who will acquaint himself with the few necessary facts and principles of spraying and cultivation need worry one moment over the results of a venture in apple growing in Wisconsin.

Jan. 10th, 1910.

A CHIPPEWA COUNTY ORCHARD OF 60 ACRES.

JAMES W. MELVILLE, Chippewa Falls.

My orchard is in what is known as the Melville Settlement, about nine miles Southeast from Chippewa Falls. This settlement consists of about four sections of land on the divide between the Chippewa and Eau Claire rivers. The land is rolling and the general elevation is over one hundred feet above the surrounding country. The soil is a fine porous clay on the hills, and in the valleys it is a dark loam, with a dark porous subsoil, which affords natural drainage. This land was formerly covered with a heavy growth of timber.

The planting of apple trees in the Melville settlement began about forty years ago.

My first planting consisted of 500 trees. 400 of which were Duchess, 50 Wealthy, and 50 crab trees. These trees are now

twenty years old. I also bought at the same time 1,000 root grafts, from which I raised 300 good trees. I planted them twenty feet apart each way. I cultivated them for three years and after that I seeded the orchard down with timothy and clover, and mulched the trees well with straw manure.

My next planting was nine years later, and consisted of 500 Wealthys. These trees I planted in rows thirty feet apart, and the trees twelve feet apart in the rows. All the rest of my orchard has been planted in the same way.

In 1900 I planted 600 more Wealthys.

In 1901 I planted 1,000 more trees, of which 600 were Wealthys, 250 were Northwestern Greenings and 150 of other kinds.

In 1902 I planted 800 more Wealthys, and 200 crab trees.

In 1903 I planted 1000 more Wealthys, 50 Patten Greenings, 50 McMahons White and 100 of other kinds.

In 1904 I planted 100 more Wealthys, and these were the last I planted.

The orchard now consists of 5,800 trees, covering 60 acres of land. The trees were all mulched when planted, and have been kept in mulch ever since. Crops of grain and hay are raised between the rows of trees, which are very little in the way of putting in or of harvesting the crops.

None of the trees have ever been sprayed, but I intend to try spraying next year.

During the last two seasons black spots have appeared on some of the Wealthys, and they drop off earlier than the rest of the fruit and will start to rot. I intend to try spraying to prevent this, but have not yet determined what spray to use, nor what is the cause of the trouble.

Our late apples, Wealthys, Greenings and other kinds, we sell in our local markets at Eau Claire and Chippewa Falls. Of the Duchess we ship part of the crop, and we are shipping more every year, as they will not keep very long.

I also desire to express to this society my appreciation for the many benefits I have received. I have read all your reports for the last 20 years. I have never planted any apple trees that were not recommended by your society. And as a result there are very few gaps between the trees. Your recommendation of the Wealthy has added thousands of dollars to the value of my orchard.

The President: A very strong endorsement and compliment to the influence of our State Society. Now, we will listen to questions.

Mr. G. J. Kellogg: How many Wealthys have you now?

Mr. Melville: Nearly 4,500.

Dr. Loope: What will you take for a half interest?

Mr. Melville: I would not sell them. When I first read your Horticultural Reports, you recommended the Wealthy as a market apple and a cooking apple, and I said that was the apple for me to plant. I planted others in an experimental way, some proved all right and some have not.

Mr. Palmer: About what time does the Wealthy ripen there?

Mr. Melville: It does not ripen the same every year, usually in October. This year a snow storm in October caught me with 700 bushels of Wealthys on the trees; it hurt the greenings and hurt all the pale-colored apples, but the Wealthy and other red apples it did not hurt at all.

Mr. Palmer: Do you Wealthys all ripen at the same time, or do you make more than one picking?

Mr. Melville: I make three or four pickings.

Mr. Bryant: I understood you planted your trees thirty feet by twelve feet, is that correct?

Mr. Melville: That is correct.

Mr. Bryant: We in Illinois think that is pretty close for trees in a row.

Mr. Melville: It would be close for a Northwestern Greening, or a large tree; I know my Wealthys were planted pretty close in some places, but they grow just as good crops.

Mr. Bryant: Do you ship your apples out, Mr. Melville?

Mr. Melville: We ship the Duchess out, because they overcrowd the local market, but we do not ship Wealthy out, because we cannot supply the local market.

Mr. Bryant: For how much did they sell?

Mr. Melville: Never sold them for less than a dollar.

Mr. Bryant: What has been your average price for the Duchess?

Mr. Melville: Never sold them below 75 cents. We started in at $1.00 but they got down to 75 cents before the season was over.

Mr. Knight: Does your Wealthy overload?

Mr. Melville: It does when it is old, but the young trees bear fine fruit.

A Member: How many years old are your Wealthys before they bear?

Mr. Melville: About six years, bear a paying crop at six years, and very nice fruit. Some years I hear some people say they drop off frequently, I do not find that fault with the Wealthy.

Mr. Reed: How old are your Duchess trees?

Mr. Melville: My Duchess trees are twenty years old. Ten years are the oldest Wealthys, there was a thousand bushels on four acres.

A Member: You have not got to shipping Wealthys yet out of the home market?

Mr. Melville: We have plenty of chances to ship them, but so long as we can sell them at home we do not want to ship them.

Mr. Daub: It is the finest orchard I ever saw, not excepting Yakima Valley or the Pacific Coast where I have been.

Mr. Melville: My Northwestern Greenings are only eight years old and they bore two or three good crops.

A Member: Have you lost any Northwestern Greening trees by winter killing?

Mr. Melville: No, the second year I planted them out there came a cold, dry year and the neighbors lost a few, but mine were too young; they looked pretty sickly, but came through all right. Then in a couple of years they started bearing.

A Member: About at what age do your Duchess come into bearing?

Mr. Melville: About six, and the Wealthy also.

A Member: Do they not nearly touch in the row when they are twelve feet apart?

Mr. Melville: No, not at six years. My oldest orchard is eleven years and they are beginning to touch now.

Mr. Palmer: Are your Duchess that close?

Mr. Melville: No, my Duchess are twenty feet apart each way. I would not recommend that to anybody, because when they get old you cannot drive through.

Mr. Palmer: You would not recommend setting Duchess twelve feet apart?

Mr. Melville: No, they ought to be sixteen feet apart at least.

The President: How long will you keep up the hay in your orchard?

Mr. Melville: As long as I can. I have a number of crops, a rotation, just the same as if the trees were not there at all. I raise a couple of crops of grain, turn that under, seed down, then turn that under.

The President: Do you take the hay off?

Mr. Melville: Take the hay off, but I put a mulch around the trees, always keep them well mulched.

Mr. Bryant: Do you not use fertilizers?

Mr. Melville: I have hauled hundreds of loads of manure from Chippewa Falls.

Mr. Richardson: How do you like the Tetofsky?

Mr. Melville: Like it very well; tried to get three or four hundred trees from one nursery in New York, they did not have any.

Mr. Palmer: Will they make a tree of any size?

Mr. Melville: Trees are small, but you can plant them close together. They are a nice, hardy apple.

A Member: Do you spray your trees?

Mr. Melville: No, I never sprayed them but last year and the year before, the Wealthys had a few black spots, they dropped off the trees a little bit earlier and if you take them to market they will not keep. I think I will spray next year.

The President: Have you any codling moth?

Mr. Melville: No, we don't hear anything about worms of any kind.

Mr. Reigle: I take it for granted that what I said this morning was not understood or heard, or that I was not believed. I did not call this man up to swear to all I said. I said there was not any scab, no curculio and there was no blight, not anything, except just the finest apples I ever saw. I would like to tell you, but you would not believe if I described what I saw in Mr. Melville's orchard. I thought when I went up in that country I made a discovery, I thought I had run right into a real Garden of Eden.

The Secretary: How much do you estimate it cost you to produce your orchard?

Mr. Melville: It never cost me very much because I raised good crops on the land all the time.

The Secretary: Did it cost you anything?

Mr. Melville: Yes, the price of the trees and trouble of manuring during that time, hauling a lot of manure on, was the main cost, never cost a great deal in cash paid out.

Mr. Daub: What is your subsoil?

Mr. Melville: Our subsoil is deep clay loam, it does not change. When we dig a well, we have to dig thirty feet before you strike water. That land is so solid and hard you would not have to curb a well, it is as hard as rock.

THE STANLEY DISTRICT.

C. L. RICHARDSON.

A portion of the surrounding country that I wish to speak about this afternoon is to the east of Chippewa Falls and Eau Claire; it is along the Wisconsin Central Line, 25 to 35 miles to the east. The country over there is a clay loam, or a loamy clay, a great deal similar to the country that has been described by the two gentlemen who have preceded me. It is not at the present time an orchard country, but in the vicinity of Stanley there are numerous small orchards ranging from a few acres to five or six acres, and off to the north there is a large amount of country that is almost a wilderness, which is probably not adapted to orchards at the present time, but which will be as the country becomes cleared up. South of the tract the country is more cleared up and there is where most of the orchards are. The section extends from the northeast corner of Chippewa County over quite aways into Taylor county, and running south of the tracks, projects for a ways into the northwest corner of Clark county. They had a little County Fair at Stanley this year, and 294 plates of apples were shown, all grown within a radius of eight or ten miles of Stanley, and they showed that at present at least there do not seem to be the insect pests and fungous enemies that are common in other sections. The fruit that was shown at the Fair was of high quality, large size and good coloring, and there is a great deal of the land in that section which I think is adapted to raising apple trees and which would be good strawberry country.

In regard to the prices of our land, any person who wishes to go into that country and start an orchard will not have a great

deal of difficulty in getting land at what would seem to be a very reasonable price as compared with what is to be found in many sections. The cultivated lands there run in price all the way from $40 to $75 per acre, and the wild lands are perhaps as low as $10 or $12, and up to $20 per acre, so that it would not entail great expense upon any one who wished to go into the country and go into the raising of fruit. A great deal of this wild country of which I speak has been logged over, but there is a great deal of small timber left on it, so that many of the people who have gone in there have found that the amount of material that they are getting off the land is aiding them very materially in their efforts to pay for the land. The section north of the tract has good railroad facilities. There is the Wisconsin Central running east and west along the southern border of this section of which I have spoken. It is cut diagonally from northwest to southwest, by the new extension of the Soo Line to the head of the Lakes, and a local logging road starts about forty miles up in the country, cutting it from southwest to northeast, so that any one wishing to go in there would find that while it is virgin country, that they would still be in close touch with civilization.

One last fact I might perhaps present, and that is that some of us got together this year and decided that we would put up a county exhibit at the State Fair, and among other things we had a fruit exhibit, and our fruit exhibit took second place in the rating at the Milwaukee State Fair and every bit of that fruit was grown in Chippewa County and perhaps one-half or more of it was grown in the eastern half of Chippewa County, omitting from this the apples that came from the Melville section and from the northern part of the county. From that it would seem that while only in a small way, yet that section is actually producing fruit of superior quality.

Mr. G. J. Kellogg: How much of that country that you describe is similar in soil to Mr. Melville's ground?

Mr. Richardson: While none is exactly similar, there is a considerable area of good apple land between Stanley and Hannibal. Much of the land for 6 or 7 miles north of Stanley and Boyd is adapted to orchard purposes, and also an area from Stanley to Thorp and 7 or 8 miles south of Thorp—making 8 or 10 townships in all.

A Member: What varieties are you raising?

Mr. Richardson. At the Fair, this year we had Wealthy Duchess, Northwestern Greening, the finest Patten's Greening that I ever saw in my life; we had McMahan's White, they were

very fine; practically all of the crab apples that are grown in the northern part of the state, the Peerless, the Dudley, Russett, Malinda and a few others. In all, I presume there were probably thirty-five varieties.

ORCHARD TILLAGE SESSION.

Topic.

"Shall we advise clean cultivation until July 15th to be followed by cover crops for young orchards (five acres or more), or may we consistently recommend a system of cropping for five to ten years after planting? If the latter, what crops, what rotation, how many years may crops be grown, and what portion of the land may be cropped?"

PROF. J. G. MOORE.

Orchards of five acres or more are commercial plantations so that our question refers to handling a commercial orchard. As the apple is the chief fruit in this state, it also presumably applies to apple orchards. Two points immediately arise in considering the question: the result on the trees, and the cost of bringing the orchard up to the producing period. From the stand point of the tree alone, I believe that a system of cultivation with cover crops most advisable for the welfare of the orchard unless great care is exercised in the cropping. It is also essential that an amount of plant food equivalent to that removed by the crop be returned to the orchard soils.

The bringing of the orchard from planting to fruiting as economically as possible, will in the majority of instances, practically preclude the clean culture-cover crop system up to the time at which the orchard begins to give returns from the fruit produced. The question then resolves itself into "What is the best practice in the cropping of a young commercial orchard?"

The length of time during which a young orchard may be cropped successfully, which means without injury to the trees, cannot be definitely stated. It will depend primarily upon the age at which the trees come into bearing. I believe it to be a mistake to grow other than fruit crops in the orchard after it has reached the bearing period. It will be seen that the length of

time for which the orcharding will be cropped will then be much less in cases where early bearing sorts as Transparent and Duchess are used, than it will where the orchard is composed primarily of later bearing sorts like Northwestern Greening.

No small grain crops are permissible in the orchard at any period of its existence, if they are to be used for other than cover crops. The choice of crops to grow in the orchard will therefore rest between the cultivated field crops, small fruits and vegetables. The latter as a rule may be passed over without consideration. Practically all the small fruits can be grown successfully between the rows of trees in the orchard. With the field crops, potatoes, beans and possibly corn, and tomatoes when grown as a field crop rather than a garden crop, will comprise very largely the list which is permissible. The least desirable of these in the orchard is corn, the height which it attains in many instances gives too much shade, particularly if planted close to the rows, and also restricts the free circulation of air through the orchard. Good air circulation is very important as a means of keeping in check various diseases which attack the trees.

The rotation of crops in cropping the orchard is not of extreme importance especially if the practice of returning the plant food by the use of fertilizers is followed. The orchard should be cropped only for a few years at most, and the evil effects experienced in the ordinary length of time would be small. However, both from the standpoint of effect upon the orchard soil, and the return from the crop, rotation is doubtless advisable.

Personally, I believe a rotation where potatoes and beans are used is as satisfactory as any. The usual length of time for cropping an orchard of the early bearing sorts usually grown in Wisconsin should not exceed three to four years where two to three year old stock is set. For a three year rotation, potatoes, beans, early potatoes would be a good combination. Follow the first crop of potatoes with a liberal application of barnyard manure. The crop of beans may be followed by commercial fertilizers in which potash and phosphoric acid largely predominates. The early potatoes should be dug as early as possible, and then a cover crop of rye or other hardy covers should be sown. The object of the cover is to protect the soil and furnish vegetable matter to be incorporated into the soil the following spring.

In a four year rotation, beans would replace potatoes as the first crop grown. In a longer period of cropping, corn might be used advantageously providing it was kept considerable distance from the trees.

The question of the portion of land which may be used in orchard cropping is one which is open to various opinions. It will depend first, upon the distance between the trees, and second, upon the age of the orchard. Personally, I would prefer leaving a strip in a newly planted orchard of from three to four feet which would be devoted entirely to the growth of the trees. As the size of the trees increased from year to year, this space would be gradually increased. At all times it would be advisable to give to the trees all of the soil through which the roots permeated, and use only that unoccupied by the trees for the crop which is to be removed. The mistake is too often made of growing other crops too close to the trees resulting in injury to the tree which oftentimes is not merely temporary but permanent.

DR. T. E. LOOPE.

If we assume an ideal location, an ideal climate and an ideal condition of soil found in a few irrigation districts, with the five acres or more to be depended on when fully developed for a livelihood then if the pocket be well filled with shining golden eagles we should cultivate exclusively allowing neither weed, grass or other crop to grow. However I have presupposed that the problem given above related solely to Wisconsin, that the person planting the "5 acres or more" was not wholly a horticulturist and was not depending entirely for the support of himself and family upon the proceeds of this small orchard.

My idea was that it applied to the farmer who had other acres to till and that this orchard was to supplement his income and provide fruit for his family and it should supply not only fruit but enthusiasm, interest and joy while growing and delight in its beauty and fruitfulness.

Again it might be a horticulturist who had an additional 5 acres not utilized and who being a horticulturist had a surplus of enthusiasm, so much so that when he decided to plant the orchard could already, with that eye of faith so common among the cult, see the growing trees the later blossoms and lastly im-

agine that he was harvesting a phenomenal crop of beautiful fragrant luscious apples and I believe he even felt in his pocket for that bag of golden eagles, so vivid is the imagination of this class of people. I know for I have been there.

I would set my 5 acres of trees 20x20 or 24x24 feet apart on a suitable location—good soil well prepared. I would cultivate until July, 15th, the first year without crop of any kind, afterwards sowing to oats or rye for a cover crop. The next year I might put in three rows of potatoes, or three rows of strawberries or a similar amount of beans or any root crop but not corn.

The following year I would put in hoed crops as before, in the meantime keeping all weeds, grass or foul stuff away from the space not occupied by the crop, rotating from potatoes to another kind of crop; if strawberries plowing them up the second year, always trying some cover crop. This I would do until the 7th or 8th year when I would seed to clover, letting that remain two years then clean cultivation the next and probably the second year—then clover again and the same rotation.

With this five acres it would be likely the horticulturist to imagine that having taken care of it for six years, he could begin to get rich returns for his previous care and hard labor. He would begin to estimate the yield of fruit at ½ bushel per tree and put the price at $1.00 per bushel. At 10 years he would estimate a barrel per tree at $3.00 per bbl. and then some. Such estimates constitutes the riches of these men. He forgets that seasons vary and most trees bear only every 2nd year. That codling moth, curculio, hailstorms and strong winds come for the purpose of keeping him to the simple life and that, unless he plants the right varieties the trees grow and grow and "never do anything else."

If he is an ordinary farmer before the trees are three years old a large per cent of them will have great wounds where the whiffle trees have torn off a map of Panama or they will have been run over with a harrow or the blue grass sod has run in around the trees. Perhaps he will neglect to spray or prune and the fruit will be unmarketable. When his trees are 10 years old perhaps hogs bear a good price or his cows give him enough profit to pay taxes and still live economically and the whole plat is given over to pasture. He wonders when the trees die and grow gnarled and the scale attacks them and the worms eat them up and the fruit corresponds,—why is it? Don't tell me this

is overdrawn for the half has not been told as you may observe as you passed through the country. "It is better to have loved and lost than never to have loved at all." So even at the worst it is better to have planted trees that die by slow torture than not to have planted any, for some day, some time, your descendants will absorb from nature the divine soul of some former horticulturist and will grow beautiful healthy trees and red, red apples as enticing as the girl's cheek he loves.

In the spring he will eagerly watch for the first bursting greenness of the leaves and will be uplifted with ecstasy at the first gleam of crimson that tells of the blossom. In the fairyland of the full bloom he will alore with raised hands, eyes and heart the great bounteous and boundless gifts of prodigal nature.

So plant apple trees, Farmer, and forget to crucify them in your cultivation. Forget to turn the hogs in when they get older. Try to be loving and careful of their welfare and some day in spring go out in the middle of that 5 acres and gaze at their loveliness. Listen to the music of the bees and the happy song of the birds and be glad that there is a heaven and and that you have 5 acres of it right here. Plant your "5 acres or more" horticulturist and when you are in the fairyland of blossom or full fruitage you won't need an aeroplane to raise you to such heights that breathing is almost suspended at the vision of beauty you have helped to create.

I know for I have been there.

W. S. HAGER.

I have always practiced cultivating and growing a crop between the trees. I have used almost every kind of hoed crop, even strawberries. I think I like beans the best, as they enrich the soil and do not shade, and are not so deep rooted as to absorb moisture, that in a dry season should go to the tree.

I think the most convenient crop to cultivate, that I ever used, was squashes, planted two hills between the trees one way, leaving a full row clear the other way, most of the cultivating may be done this way with two horses and a spring tooth harrow, and one horse may be used the other way.

This method I consider nearly as cheap as clean cultivation.

However I do not advise growing squashes unless you have the market or grow mammoth kinds for stock feeding on the farm.

In my part of the state, I have seen no necessity for cover crops, as we usually have plenty of snow, and I have always considered that a cover crop takes too much moisture from the soil, especially in a dry fall and a winter when it freezes up without rain.

The most severe winter, that I ever experienced, was preceded by a dry fall and I had a young orchard in which beans had been grown, the snow was deep, and I did not lose a tree.

I do not want to go on record as saying that clean cultivation is not advisable, as I think, under some conditions, it may be the best way. But I have found that I could grow a crop and trees at the same time, without having the crop cost more than it is worth.

However, with the average farmer, with little and expensive help, I think clean cultivation might be best, but by all means cultivate. The partial cultivation and partial mulch system looks to me like an excuse only.

W. H. MARSH, Antigo.

As my experience has been somewhat limited along this line, I will not take up the time that might perhaps be better used by others. I will say, however, that I have worked more along the grass culture line. The trees have made a very good showing, a little slower growth, perhaps than if cultivated but they are coming well to fruiting. The grasshopper proposition presented itself in a very striking manner this summer and in looking over other orchards I am well satisfied that cultivation is the proper method to be used. But as far as I have worked out the thing, I like the small cultivated crop system in preference to clean cultivation. I think potatoes and beans are all right.

D. E. BINGHAM, Sturgeon Bay.

For fourteen years we have been practicing cultivation of orchards. In that time we followed about the plan which I am going to give you. We crop our orchards from the time they

are planted, using the rotation that Mr. Moore outlined, potatoes, beans and small fruits excluding the strawberry. I would not under any consideration use the strawberry in the orchard the first year, that is, unless I was going to dig the plants for sale in the fall. The first year you get very good results, the tree does nicely, the second year you get a set back that practically puts you back more than you gained. The reason for that is, the strawberry takes a great deal of moisture from the ground and you have practically a sod condition with the excessive amount of moisture that the strawberry takes from the soil. We have practiced planting or sowing a narrow strip of peas between the rows of trees and cultivating each side with a spring-tooth harrow; we have found that is not as practical as using open culture. We have set strips of clover leaving a chance for cultivation around the trees, and still we found that in the seasons when it gets a little dry we are in need of a little more moisture by the strip of clover taking out some of the moisture that we ought to have for the trees. We find our best condition is clean culture. We do not get it always, oftentimes we have a little strip of sod, sometimes we have more than we can handle, and sod gets around the tree, say a circle of three or four feet, but we find that is not injurious to the tree, the feeding roots are out beyond that, and we have ample room to cultivate and give all the moisture that is necessary. We do not use a cover crop in the orchard. It has always been a question in my mind as to how we add fertility by a cover crop. If we use a cover crop, what do we add to the soil in the way of humus? We allow the late growth of weeds to form our cover crop, say, from the middle of August we get a sufficinet covering over the land to protect the ground during the winter. I have sometimes thought that it was better to use a crop on the land during the growing season. I believe that if you take a young orchard and continue cultivation for a number of years without any crop you will destroy or use up the humus. You have to add that in some way. I believe if I were going to use a cover crop I would have some thing that would grow luxuriously and give me something to turn under in the way of vegetable matter. The system we follow is rotation of crops like beans and potatoes. I do not like a corn crop, it is a detriment to the foliage, especially if the corn crop is high, the foliage on the trees will be poor, especially in the cherry orchard.

The apple orchard is under discussion, but I believe the same would be true in the cherry orchard, lack of circulation of air and you would have foliage injury that you would not have in open culture.

R. J. COE, Ft. Atkinson.

Really I do not know what there is left for me to say. Prof. Moore, Mr. Bingham and Dr. Loope have said about all that there is to say along this line but to cultivate or not to cultivate, that is the question; whether it is better to cultivate and make our trees grow and keep them healthy, or to not cultivate and let them die. That is about the way I look at it. The ideal cultivation, I take it, is absolutely clean cultivation. That is to say, absolutely clean cultivation holds the moisture in the soil, puts the soil in the best possible mechanical condition for the tree to grow; but, on the other hand, it has some disadvantages. In other words, clean cultivation constantly followed up, robs the soil of its fertility, robs the soil of the one thing that we must have in the soil to make our crops grow well, namely, decaying vegetable matter or humus. So then we are driven of necessity to the growing of some crop, or adding some material to the surface of our soil to keep our soil in the best mechanical condition. I believe that we can grow some cultivated crop the fore part of the season with very beneficial effect. We want to keep the soil covered with some growing crop almost constantly, because there is almost all the time some fertility developed in the soil by the cultivation and if we had to raise some growing crop in there, it would take up this fertility that is developed, made available and we can hold it near the surface of the soil so that our plants can get it a little later on when these roots and tops go to decay. This in brief is about my idea of whether we should cultivate or not. A few years ago—this may be a little off the topic perhaps, but it is along the same line—at the Nurserymen's Convention in Chicago, Prof. L. H. Bailey, whom everybody knows to be the best horticulturist the world has to-day, made the statement that there are more nursery trees grown and planted every year than there are bearing trees all told, following this statement by another, which was something like this: People will buy and

plant trees and not care for them and they never arrive at the fruiting age. The moral was of course that if we plant trees we should care for them. The immortal Patrick Henry once said, "I care not what others may say or do, but, as for me, give me liberty or give me death." As for me, Mr. President, give me a cultivated orchard, or give me none.

L. H. PALMER, Baraboo.

Clean cultivation followed with a cover crop would be an ideal way to raise fruit if one could afford to wait eight or ten years for returns. I always had to make my land pay as I went by raising crops among my young trees.

The first year I plant to some cultivated crop, rowing both ways to save too much work with the hoe, and leaving the space next to the trees a little wide. As the trees grow lessen the amount of land cropped, thus giving more to the trees.

It is generally necessary to seed to clover every two or three years, to loosen the soil and prevent washing. Fruit trees like any other crop require plenty of fertilizer and I find my best trees are those I feed the best.

It is my belief that if there is something coming in as you go along, the average man will work his trees a little better, than if obliged to wait eight or ten years for the first crop. This method of cultivation gives me good trees free of cost at ten years of age.

I have been thinking about this bean culture, I have never tried it. I would like to ask what kind of beans they raise among the trees and how they raise them.

Mr. D. E.Bingham: We plant the common white bean and I believe we get goods results, not figuring the beans for the market. The results that we get are better cultivation and less humus loss, and we also get the crop of beans, sometimes they average fifteen to twenty-five dollars an acre in one season, it depends upon the conditions under which you can get them harvested and threshed. I believe we are coming to that method of orchard culture planting something and cultivating it without any reference to the crop that we get. A very convenient way

of planting beans is to use the single horse planter, mark out the ground, then hitch the horse to the planter, then go along the mark, planting two or three beans every two or three inches, depending on the size of the beans. You can plant from one peck to one bushel per acre. We usually use about a bushel to the acre on our orchard.

The President: We have delegates from sister states whom we wish to hear from, and I will ask Mr Pratt from Michigan to speak on this subject.

Mr. Pratt: Perhaps our methods are a little different than yours in Wisconsin. I have noticed from the discussions that you are planting your trees a great deal closer than we do at the present time. We used to plant them closer, but now our apple trees are planted from thirty to forty feet apart each way. Of course we raise a great many other kinds of fruit. At Benton Harbor, down in the southwestern corner of Michigan, we raise a great many peaches. While they used to be planted, fifteen or eighteen years ago, as close as twelve, now, we are planting twenty to twenty-four feet each way and we get better crops, better peaches, more satisfactoin all the way around. As to cultivation there are two methods practiced; We have the sod mulch system, that is used only on land that is hilly and likely to wash. The trees are set on this land and it is seeded down to either clover or timothy and this is cut each season, and a large portion of that is piled around the tree so that no grass will grow under this mulch right around the tree, and the rest if it is used for grazing until the trees get big enough to take it all up. The mulch around these trees is kept up as far as the limbs of the trees reach and as the trees grow bigger, the sod mulch is stretched out farther.

In regard to clean culture methods, the first year we plant our trees in the corn field, each tree taking the place of a hill of corn and we get very good results that way, better than any other method we have practiced. After that there are various methods used, some use potatoes, same use beans, others vegetables. In the southern part of the state we have a good many small farms, five and ten acres that make a good living and every foot of ground has to be utilized, and the consequences are that we raise a great many vegetables there, as we are close to the Chicago market, and they can sell their vegetables at a

very good profit; but, on the other hand, on the larger farms, Michigan has learned another lesson, and that is, too much clean culture and not turning back any humus robs our soils. At the present time there are a great many farms that are depleted of humus, and the method now is, in some of the younger orchards especially, they cultivate down the tree rows a strip about three furrows wide, the rest seeded to clover. This is left about two years, the first and second crop of clover is usually taken off and what ever grows up the following spring is turned under and in that way we have got the humus back into the soil to quite an extent, but on the smaller farms where we raise the vegetables, we sow a cover crop in the fall, which grows very rapidly, and such a winter as this it will grow under the snow nearly all winter, and in the spring we will have a fine growth to turn under, which helps turn back this humus in the soil, and this method is followed out until our trees come into bearing.

Mr. President: We will now hear from Mr. Bryant of Illinois

Mr. Bryant: I want to say that while I am from Illinois I am not going to speak of Illinois practice entirely, I am going to speak from my own practice and experience, and would say that Prof. Moore's remarks at the start were very much in line with my ideas. We plant our trees thirty feet apart, and use corn for the first few years without any rotation. I would say with us that in our ordinary soil the trees do not need any stimulation the first few years, we get growth enough, we do not care to encourage more until they begin to bear, then we practice the clean cultivation the earlier part of the summer and where trees are bearing heavily we put on manure. I said we planted the trees thirty feet apart each way and in that way we can plant seven rows of corn, putting it two feet and a half apart each way, rowing both ways, and that will leave a wide space next the tree, perhaps about four feet and a half, and of course that space right next to the trees you have to cultivate with a single horse, it gives a little more air and room next the trees and a better chance to cultivate. I do not know that this question extends any further than the first few years, it does not refer to the later practice. I was going to say that we practice clean cultivation after the tree comes into bearing for the earlier part of the season and then we apply a cover crop. We think that is very essential. Our conditions of course may be differ-

ent from yours here, you have more snow, but I want my ground covered during the winter time with something, and even where we put on corn, we like to sow something at the last cultivation of the corn, so that there is something on the ground after the corn is cut off. Of course we sometimes do not get very much growth in amongst the corn, and I can see that this method might vary on ground that was liable to wash, and in some places it may not be practicable to do that. I have noticed in the Rural New Yorker, some of Mr. Collinwood's experiments in planting an orchard. He put around anything, hay, straw, weeds. Now, that practice would not do at all with us, because of the danger from mice in the winter time. We have to be very particular about that and whenever I put on a cove rcrop, I am particular in the fall to have a clean space immediately around the trees, but I want a cover crop as well, because, as has been stated here before, I think you will destroy all the humus if you practice clean cultivation without returning something to the soil, something in the way of a cover crop, or a heavy coating of stable manure.

A COMPARISON OF TILLAGE AND SOD MULCH IN AN APPLE ORCHARD.

O. M. TAYLOR, Geneva, N. Y.

Among all the horticultural industries of the Empire State of New York, the culture of the apple ranks first in importance. It takes this position not only in the value of the fruit produced but also in the value of the lands devoted to this crop. Apple-growing as a business has come to receive special attention only in recent years, and is yet comparatively young, dating back no more than 50 or 60 years to the first great movement in the planting of apple orchards in New York.

In those earlier days, little, if any, careful systematic study had been made regarding cultural methods. The subject itself was new and there were no past experiences to serve as guides in regard to selection of varieties, distance of planting, pruning, enemies of the fruit and tree—both insect and fungi—or of the proper treatment of the soil to secure best results. But as the years passed experience was gained and now at the present time

we find specialists in apple-growing who are giving most careful study to each one of these subjects and no one to-day is so unwise as to set an orchard without looking into the subject most carefully in order to avail himself of the rich experiences of the past years.

It is not my purpose to note the progress made along all the subjects connected with successful orchard management. They are too many and the time too short, only one phase of the subject has been selected, namely: The relations of "Sod" and "Tillage" to the apple orchard.

In earlier years the trees were set in sod, or, as was more commonly done, were set in cultivated land which produced tilled crops for six or eight years, after which the ground was seeded down to remain in sod for a series of years, being used either as pasture or for the production of hay. As time passed many of these orchards became or continued to be unproductive until in despair the cutting down of the trees was seriously considered. The Tillage movement which was the reaction following such a condition gradually secured a prominent place until the cry of "tillage and cover crops" appeared to be the only method of procedure.

During the last ten years, however, opposition developed against this system. It was not confined to New York but seemed centered at two points; in Ohio under the leadership of Mr. F. P. Vergon, a prominent and successful orchardist under the sod or grass mulch system of apple culture, and at South Onondaga, near Syracuse, N. Y., from which place Mr. Grant Hitchings year after year exhibited at the State Fair many varieties of the finest fruit, both in size and color, carrying away numerous prizes for best plates of varieties and of collections. The prize-winning fruit came from trees grown in sod; the marked results secured here, and also from scattered orchards throughout Western and Eastern New York, created considerable discussion as to the relative merits of "Sod" and "Tillage".

These two men not only made vigorous claims but also put up the goods to back their assertions. They exhibited fruit of the highest degree of perfection. Owing to the results of Mr. Vergon, the Ohio Experiment Station at Wooster began a series of experiments in 1900, a preliminary report of which may be found in Bulletin 171 published in 1906, which is designed to be suggestive rather than conclusive.

The New York State Agricultural Experiment Station at Geneva secured in 1904 the use of an apple orchard at South Greece, near Rochester, in order to throw some light upon this question and to demonstrate the comparative value of the two methods under the conditions existing in those places, and to discover, if possible, the reasons for the results that might appear. The experiment was to run for ten years in order to secure fair average results. Five years have now passed and it may be of interest to note the progress of the work to the present time.

The orchard at South Greece, seven miles west of Rochester, is owned by Mr. W. D. Auchter. It consists of 9½ acres of Baldwins set in 1877, the trees standing 40 feet apart each way. The surface soil is a medium heavy clay loam. The subsoil is of heavier loam yet containing enough sand or gravel to make it porous so that the trees do not suffer from lack of under-drainage. The surface is nearly level. This orchard is typical of many of the commercial orchards scattered throughout Western New York.

Plan of Experiment. The orchard was divided into two equal divisions, one-half kept in sod—the other half plowed early in the spring, receiving from four to six cultivations during the summer until the last of July or early in August, at which time a cover crop of clover or oats was sown. The grass on the sod half of the orchard was cut once or twice each year as occasion required and was allowed to rot where it fell. The spraying, pruning and fertilizing treatments were same on each plat.

The following is a statement of some of the results obtained with both tree and fruit.

The average annual yield on the sod plat for the five years was 72.9 barrels per acre; for the tilled plat 109.2 barrels—a difference of 36.3 barrels in favor of the tilled plat.

There was a marked difference in size of fruit, requiring an average of 434 apples per barrel for the fruit from sod and 309 apples for the fruit from the tilled trees; the fruit from sod trees averaged 5.01 oz. and the fruit from cultivated trees 7.04 oz.

The fruit from the sod mulch plat was of better color than that on the tilled plat—it matured from one to three weeks earlier; it was inferior in crispness, in juiciness, in flavor and in quality.

The average gain in diameter of trunk for the trees in sod was 1.1 inches; for the trees under tillage, 2.1 inches.

The average annual growth of twigs of the trees in sod was 3.4 inches; of the tilled trees 6.7 inches. The total weight of 240 twigs from sod trees was 7.2 lbs.; from trees under tillage, 21.3 lbs.

The leaves on the sod trees were yellowish—on the tilled trees a dark, rich green.

FINANCIAL STATEMENT.

The average annual cost per acre, not including harvesting, was $17.92 for sod, and $24.47 for tillage—a difference of $6.55 in favor of sod.

The average net income per acre from sod was $71.52, and from tillage $110.43, thus giving an increase due to tillage of 54 percent.

CAUSES OF DIFFERENCE.

Moisture. The soil to the depth of one foot showed as the average of 120 moisture determinations 156.24 tons water for sod; 235.98 tons water for tillage—an increase of nearly 80 tons in favor of tillage.

Temperature. At a depth of 12 inches the average temperature for sod was 65°; for tillage 67°—difference of two degrees in favor of the soil under cultivation.

Humus. The amount of humus in the soil to a depth of six inches was 19.98 tons per acre for the sod plat and 21.78 tons for the tillage plat—an increase of 1.8 tons in the soil under cultivation.

The facts presented include the essential features of what happened in an apple orchard under a tillage system and under a system of sod mulch. The soil, the trees and the fruit have each in turn told their story, and the evidence is before you. Yet it must be kept in mind that the results do not prove that tillage under all conditions is the only proper method of procedure. Every orchard has its special problems and every apple grower has a problem of his own. Any method to succeed must be adapted to its environment. The relations to the plant of humus, of heat, of food, and of moisture are fundamental. It would therefore appear that the problem of the apple orchard

may in a measure be solved by the application of the laws of plant growth.

Mr. Bryant: How heavy a mulch would there be in this orchard, did you manure the orchard, endeavoring to encourage growth of grass?

Mr. Taylor: The farmers in the neighborhood who viewed the orchard before the grass was cut estimated that if the crop had been removed and turned into hay, it would have averaged about two tons to the acre. Now, in regard to the method of mulching; when we were taking our soil samples—trees forty feet apart—very often we would mark the center of the four trees and dig down at that place finding roots of apple trees as large as a lead pencil; the roots were occupying the entire surface, so there was no object in gathering together the grass; it was simply allowed to rot where it fell.

A Member: Did you apply the fertilizers to the part that was cultivated?

Mr. Taylor: The fertilizer question is asked for; when the orchard was taken it was the general impression throughout New York that many of the orchards soils were deficient in phosphorous acid, and acting upon this general impression, an application of four hundred pounds of acid rock per acre was applied to the entire orchard. This was done for three years. The question was then raised, do we know that we are receiving any benefit from this liberal application? The next year, in place of applying it to the entire orchard, there were two cross rows taken, running across both sod and tillage sections, and the acid rock was applied at the same rate. Further over in the orchard two more rows were used, applying potash at the rate of four hundred pounds per acre. This was continued for two years and although at one of our summer meetings the second year of this application there were 200 fruit growers going through the orchard, the cover crop being about one inch high, yet no one was able to discover any gain in any way to the cover crop or the grass, to the leaves or to the fruit from the use of the fertilizer and since then no fertilizer has been used in the orchard. We have the orchard for four years longer and it is not our intention to apply any fertilizer, for we have apparently received no benefit from its use in this particular orchard.

A Member: What is the nature of your soil, what kind of soil?

Mr. Taylor: The surface soil, is a rich, sandy loam to a depth of about ten inches, and it is underlaid by a compact, sandy subsoil; there is good drainage.

Mr. Melcher: Is there any difference in the keeping qualities of those two samples you have there?

Mr. Taylor: In regard to the keeping qualities; the fruit on this plate, which represents the sod section, has become mealy and is not pleasant to eat. The fruit from the tillage section is from one to three weeks later; it will be in pleasant condition for eating for at least three weeks longer than the fruit from the sod plat. Now, that is not because the flavor is necessarily better. If the fruit could be tested out at the same time of maturity, there probably would be no difference, but one is further advanced that the other.

PRINCIPLES OF SMALL FRUIT-GROWING.

(Discussion following above topic, page 74.)

Mr. O. M. Taylor: May I say a word about the Perfection currant? I was greatly interested in what I heard yesterday in regard to this currant, and when your secretary sent me the program, seeing that a special report was expected from Wisconsin, I gathered together the information which we have at the Geneva Station, thinking that some of you might be interested in knowing how the Perfection currant does in New York state. The following is the report:

At the Geneva Station the Perfection currant has been grown since 1897. In bush characters it is intermediate between its parents, Fay and White Grape. The size of cluster and berry exceed that of Fay and the fruit is well formed to the tip of the cluster. The stem of the cluster is free from berries near its attachment to the plant, thus making it easy to pick. The color is slightly lighter than Fay; in flavor and quality it is superior to Fay or Cherry. It ripens about with Fay and Cherry and appears to be one of the most charming of the more recent introductions.

Mr. M. S. Kellogg: I should like to ask Mr. Taylor if they have succeeded in any degree in controlling the anthracnose at Geneva with Bordeaux mixture.

Mr. Taylor: In experiments Prof. Paddock carried on several years ago he succeeded in keeping it controlled with the use of Bordeaux mixture, but it was necessary to make so many applications that the expense was so great that it was not practical and at the present time the method recommended for fighting anthracnose is planting every four or five years in new ground.

Mr. Daub: At what age is the currant wood the most prolific? You spoke of cutting out the older ones, at what age should it be cut out?

Mr. Taylor: The currants are not borne upon the new wood after the bush is about four years old, some of the older wood should be taken out each year, and each year it is always necessary to take out some of the weaker of the new growth, as too many canes will develop.

Mr. Daub: Then you would say about four-year old wood?

Mr. Taylor: Yes; it would depend a little on the natural vigor of the canes. The important point to watch is this; no crowding of the branches of the bush; you can readily determine whether there are too many of the canes developed, and from the fourth year on it is necessary to watch the bushes in regard to trimming and taking out the older wood. I believe in New York state we fail in this one particular more than we do in any other way in the growing of currants. We allow too much of the wood to remain in the bush.

Mr. Richardson: I would like to ask a question in regard to cultivation, frequent cultivation produces dust mulch and that dust mulch keeps them from drying out?

Mr. Taylor: Yes.

Mr. Richardson: Then in dry weather, in June, July and August, would you cultivate a great deal, and hoe up close to a strawberry plant, so as to have a dust mulch?

Mr. Taylor. This is the new planting?

Mr. Richardson: Yes, new planting.

Mr. Taylor: In doing this work it is necessary to have the cultivation very light, not deep, and in exceptional cases—this was true I remember nearly twenty years ago in Wisconsin, in an unusually dry season, potatoes that were cultivated I

think nearly every day—were not saved by the cultivation, and in extreme cases I could see that the cultivation of the strawberry plant with its roots close to the surface might in time, if the drought continued too long, be injurious but in ninety-nine cases out of one hundred, if the cultivation is light, it will do more good than injury.

Mr. Richardson: I have had the theory for several years that hoeing, if you hoe fairly deep in dry times, was liable to do about as much harm as good. One has to be very careful at that time of year.

A Member: How about pruning strawberries?

Mr. Taylor: The general practice in New York is to plant the varieties that send out many runners at quite a distance apart, planting such varieties that send out few runners closer together and very little attention is paid to the pruning of the strawberry. It is true that in a great many strawberry beds there are too many weeds, and when there are too many strawberry plants, a strawberry plant out of place is a weed; that is one of the troubles why we have so many small strawberries, there is not enough moisture in the soil for all of the berries and one of the most difficult things we have in strawberry growing is to get our plants far enough apart and if the people in Wisconsin have an inexpensive method of doing this, I certainly would be glad to carry it to New York.

Mr. G. J. Kellogg: What is the best plan to get rid of strawberry insects that are injurious? I speak now of the leaf roller, ground borer and anything else, can you spray?

Mr. Taylor: I know of no strawberry growers in New York state who find it profitable to spray each year. In exceptionally few cases spraying is resorted to for the blight of the strawberry leaf, but my observation is that it is not continued more than three or four years by those who make the attempt. They prefer to select a higher elevation with better air drainage or to change to some variety that is more blight resistant. In regard to the grubs that attack the root; the avoidance of sod ground is the only method followed. No spraying at the present time is carried on generally for the strawberry.

Mr. Kellogg: The slug that works on the leaf, and leaf roller.

Mr. Taylor: So far as I know, very little if anything is done in regard to those insects. We have never been troubled with them at the Geneva station in sufficient quantities to cause any

necessity for spraying. Arsenical sprays must be used for leaf-eating insects.

The President: How much good can be done by what the gentleman spoke of, mowing and burning, would it not be better to turn under old beds?

Mr. Taylor. The question of whether the old beds should be retained, or plowed up and a new bed started depends upon conditions. In may cases, if the beds are fairly healthy and not weedy, it may be advisable to hold the bed another season; but if the weeds are coming in thickly, if they are becoming troublesome and the plants unhealthy, it generally is much more satisfactory to turn the bed under and depend upon a new bed coming on to furnish the fruiting bed the coming year.

The President: What about the mowing and burning?

Mr. Taylor: Mowing and burning will sometimes be beneficial in destroying a large number of insects and fungus troubles, and yet Mr. E. L. Doty of Ilion, N. Y., who is growing at the present time eighty acres of strawberries, and who has grown strawberries continuously since 1867, informed me last summer that he has abandoned the method of mowing and burning.

THE NORTHWESTERN GREENING APPLE.

Its History; its place in commercial and in home orchards; is it a winter apple?

Shall we include it in a list of "Five best apples for the home orchard in Wisconsin?"

In a list of "Five best for commercial orchards?" In a list of "Three best?"

J. G. MELVILLE, CHIPPEWA FALLS.

I am not very well prepared to discuss the Northwestern Greening, but will tell you what I think of it and my experience with it in the Melville Settlement.

Eleven or twelve years ago I heard some members of this society speak well of the Northwestern Greening. A year or two later, in 1901 I planted 250 trees on the strength of what I heard society members say. These trees grew rapidly from the

start; even surpassing the Wolf River trees, which I planted at the same time. The second winter after I planted my Greenings the weather came very cold and dry. Nearly half of the older trees of Greenings that my neighbors had planted several years before died that winter or the next year. I think it was because they bore quite heavy the year before. My Greenings looked rather sickly after this severe winter but all lived; the Wolf Rivers lived also but the Ben Davis and Baldwins all died.

Since that winter my Greenings have made a fine growth and are now the largest apple trees on the farm for their age. They have a tendency to rot in the heart where the land is too rich.

I expect to make money off of my Greening trees as they have borne two good crops already; and I expect a bumper crop next year as I have mulched them heavy with straw manure. I will try and make them bear as much as possible and as fast as possible for we might have another cold and dry winter; so much dreaded by people here in the settlement.

As a dessert apple the Greening, I believe, is nearly a failure, but because of its fine appearance it sells well as a cooking apple and it is said to be good as a cooking apple. Of that however, I cannot speak from experience as I have never used them in my own family.

I was rather unlucky with my Greenings last season. We had a snow storm in October and it froze quite hard and I picked them off the trees while they were still frozen. The Greenings, Longfields, Gideons were badly rotted while the Wealthys, McIntosh Reds and Snows were not injured in the least.

The Greening, ordinarily will keep until, I believe, the first of March and is therefore a winter apple and will keep that long in a nice firm condition unless it has been much frosted before picking. After that it seems to go to pieces quickly.

I would not include it in the list of the five best apples for the home orchard for my own use. It is too poor in quality.

I would include it in the list of the five best apples for the commercial orchard. It is hard and solid and should ship well and sells well and I would say would be about third best apple for a commercial orchard.

I would hesitate to plant too heavily of the Greening as I do not consider it entirely hardy. An unfavorable winter might kill too many of the trees. In our section we are very much

in need of winter apples for commercial sale and as the situation stands with us, I know of no apple more worthy of third place than the Northwestern Greening.

L. H. PALMER, BARABOO.

The Northwestern Greening is giving good satisfaction in our locality. The apple is good size, a good bearer, sells well and will hang on the tree until cold weather. It keeps fairly well. There is some complaint about the apple rotting on the tree before picking time but when thoroughly sprayed there is little trouble along these lines.

I think for Sauk Co. the Northwestern Greening can be safely placed in list of five varieties for home use and in the list of both three and five for commercial purposes.

L. G. KELLOGG, RIPON.

At the beginning of this discussion we shall assume that the N. W. Greening apple is under indictment as not having sufficient qualifications to recommend it for a place in the home or commercial orchard. This question has been before a qualified jury, the apple growers of the state, for 25 years and it seems to be the verdict that the N. W. Greening is entitled to a place in the home and commercial orchard upon soils and locations that are adapted to apple growing. In judging fruit at county Fairs in widely separated sections of the state, I find the N. W. Greening in nearly every collection competing for honors and resulting in the closest competition.

I find it in nearly all of the events or entries of 5 and 10 varieties adapted to Wisconsin. The N. W. Greening may be an unusual apple for exhibition purposes but I feel that we must accept the verdict of the people and place it in the recommended list for the State of Wisconsin as one of the 5 best apples for the home and commercial orchard. If I were to select only three varieties for the home orchard I would substitute Newell in its stead as this variety is of better quality and will keep nearly or quite as well in ordinary cellar storage.

In a list of three varieties for commercial purposes I would include the N. W. Greening for its productiveness, uniform size, and attractive appearance in market.

Is the N. W. Greening a winter variety? I do not see how there can be any difference of opinion on this question that will even admit of any discussion. I would class any variety that would keep fairly well into the month of February or March in ordinary cellar storage as the N. W. Greening will do a strictly winter variety in this latitude.

H. C. MELCHER, OCONOWOC.

In assigning this subject to ten men in widely scattered sections of the State, there naturally will be very much repetition, also very much honest difference of opinion, for each one is expected to correctly represent his district.

We all know that the profitable apple must combine size, productiveness, hardiness and quality; if it is a red one, so much the better. Does the Northwestern Greening fill the bill, or are there lesser reasons why we should continue or discontinue planting it? As a rule the size is all right, especially the first few crops which are usually very uniform; the exception to the rule being older trees that have been neglected when you will often find on a single tree all the sizes known to the market.

In productiveness it is very erratic; it is never an early bearer, and a Wealthy tree planted the same time will earn several dollars for its owner before the Northwestern Greening gets started.

I was called upon last October to prescribe treatment for an orchard, some of the trees of which had been planted twelve years and so far had failed to produce a crop of fruit. The owner, a wealthy Chicago gentleman, was disgusted with it, and was ready, if I said so, to lay the axe to the root of every tree. On my way to the orchard I tried to forecast in my mind the conditions I was likely to find there, and such things as improper location, poor drainage, lack of pruning and other things suggested themselves. Imagine my surprise on reaching the orchard to find it located on a northeast slope, well drained, and a better pruned orchard than my own. An occasional scabby specimen of fruit revealed the fact that all of the larger trees were Northwestern Greenings. The orchard was practically a lawn, contained about two acres and was kept closely clipped and all clippings left on the ground. The trees were all mulched, and in appearance, all that could be desired. Not knowing what

else to do, I implored him to leave them still another year, to cultivate and dig around them, and if they still persisted in remaining unfruitful, to obey the mandate of the Scriptures and cut them down and cast them in the fire.

In southern Wisconsin it is considered entirely hardy. There has been practically no winter killing since the disastrous season of 1899, and that was the dry condition of the ground as much as the severe cold.

But how about its quality? And right here is where we part company. I am speaking from the view-point of the home orchardist, and the home orchardist is entitled to the very best that can be raised in his locality, and he can well afford to sacrifice quantity for quality. It will take some experimenting to find out what the varieties are but that should not deter us. I planted Northwestern Greening to get acquainted with it, and I must say that our acquaintance never ripened into friendship. We certainly have three better apples for the State at large, and in my orchard it is not one of the five best.

Has it a place in the commercial orchards of Wisconsin? We think so. There are sections of the State where it does extremely well, notably in the Sturgeon Bay district, and as long as there are so many people to whom an apple is an apple, regardless of quality, there will be a demand for them and the demand will be supplied.

Is it a winter apple? Grown anywhere in Wisconsin it is and that is its strong point, for we have comparatively few of the long keeping varieties, and if it came in the same season as the McMahon, it would have no place in Wisconsin horticulture.

At the request of Mr. Coe, the President called upon Dr. J. W. Coon, of the Wales Sanitarium, to talk on the Northwestern Greening apple.

Dr. Coon: Whenever I see a Northwestern Greening I always feel sort of a proprietary interest in it. It seems like an old friend always, because, as was stated by Mr. Coe, I have had something to do with the first propagating of that apple which has now become so prominent in our Horticultural meetings and in fruit societies of every kind. It was, I believe in 1873 that Mr. Hatch of Iola exhibited the apples of this seedling tree; it was

then known as Hatch's seedling and Mr. E. W. Daniels bought the right to propagate it in the fall of 1873, I believe, and the scions were first brought in his nursery that fall and winter. I was then a young lad fifteen years old, and for about five or six years was making my home with E. W. Daniels, helping him in his nursery work, so that I think that I did the first grafting, perhaps all that was done for two or three years of this apple, which is now known as the Northwestern Greening. Mr. Daniels bought the right to propagate from this tree. There was also a little question between Mr. Hatch and Mr. Daniels, as to whether he had paid a fair profit. I believe he was to pay some royalty, but at any rate the tree was started at that time, in 1874, and has grown to what you all know as its great proportions at this time.

MR. A. J. PHILIPS.

"Is it a winter apple?" Yes. In sorting over a number of barrels last fall that I was selling, when I found a very nice one I put it in a barrel. That barrel is in the cellar yet with nearly all in it, and last Saturday, when I looked them over, I found only one apple that was too rotten to use out of a bushel and a half, after being kept in a common cellar. That is good evidence that it is a winter apple. I feel a great deal as Mr. Coon does, I have a little interest in that apple. Mr. Daniels said when they were pitching into him and the apple, that I was about the only friend he had and he made me a present of the first six trees I had, and I have those trees bearing yet. Now, Mr. Palmer says he puts it in the five best winter varieties for commercial purposes or for home use. I do both and I would put it in the three best for commercial purposes on account of its general appearance.

MR. M. S. KELLOGG.

I have listened with a great deal of interest to what has been said about the Northwestern Greening, and I regret that I shall be the first one to take a few knocks at it.

It is considered one of the leading varieties, but in our section of the state I would say, as far as production and profit go it is absolutely without merit, for the reason that on our black prairie loam, you get so little fruit, you wait so long for it, and when you

get it it is so poor, that you can grow more of other varieties that are practically as long keepers, that will take its place and will be more profitable for home orchards and commercial in our section than the Northwestern Greening. With us it needs a great deal of pruning and must be sprayed very thoroughly to get any fruit at all, and our experience has been in a series of years, that the fruit will decay on the tree before it matures, even with the application of the spray, unless you make four or five applications during the summer, the black spots will come on the sides of the apples from which cracks will radiate and in a few weeks' time the apple is decayed beyond any hope. It certainly is a winter apple grown on proper soil; with us it arrives at its maturity late in the fall and under our most favorable conditions we have kept them until Christmas, or a little later, but I have seen apples on our market shipped from the northern section of the state, grown on heavy soil, that have been in prime condition in the latter part of March and April. I would not include it in the list of five best varieties for the home orchard, but I would include it in the list of five varieties for the commercial orchard, but hardly in a commercial list of three for the southern section of the state. The tree itself is one of the most valuable varieties that we have in our nursery work, as the country throughout which it succeeds covers such a wide range, there is immense demand and ready sale for all the trees that can be propagated and while some of these things are to the detriment of the variety, it is one of our valuable apples.

MR. BINGHAM.

The standing of the Northwestern Greening apple, as I have observed it for the last fourteen years, is about as follows: I would not place it in a list for the home orchard, I would include it in a list of five best for the commercial orchard and I would give it about fifth place; I would not include it at all in a list of three best for Wisconsin. We find the Northwestern in the lake region and in Door county, especially, is very early about coming into bearing. It produces good crops annually, getting a light crop oft-times the odd year, or off year from the heavy crop. We find that it gets to be a good size; its keeping quality varies with different seasons. We often find it necessary to make three grades in packing in order to get as good results

as we would from other varieties with perhaps two grades. They are uneven in size, uneven in coloring, as to the quality, we all know. The tree is a good, hardy, vigorous and rapid grower; it needs thorough spraying and good orchard culture in order to make it do its best. We get more apples perhaps after the trees attain an age of twelve or fourteen years, more barrels per tree or per acre than we would of the Wealthy. It does not drop its fruit, but I think it will not stand up on the market with varieties that we have in Wisconsin today for yields, and the quality is such that I would not put it in a list of three best commercial and only include it in a list of five best commercial at the present time.

MR. W. H. MARSH.

The Northwestern Greening, as we have heard from different papers, makes a different showing in different places. In the Wausau orchard it made a very excellent showing. The only spot in the orchard where it did not come to what we might call absolute perfection was the north side of one tree where the limbs run out under a clump of plum trees which had no business there. Those were spotted, and I believe it as a fruit needs very open head work, needs air and sunshine. Some will do well without and others demand it. I believe the Northwestern is one that demands a free circulation of air and sunlight. It also needs thorough spraying. As we look over the fruit display here, we have no apple that shows up better, more rounded out than theNorthwestern Greening. We do not need gloves to handle it and it does not need any polishing to make it show up properly. It is uniform in shape, its color is all right, its quality and flavor are fair. We cannot expect everything in one apple. We can use it in January, February, March, April, May, June or July and it does very good service in those months. The tree up with us in Langlade Co. is proving hardy, excepting in spots where there is hard pan underneath and there I do not believe any tree has a fair chance to make a fair showing. It develops a cancer which proved very troublesome in spots. It has a tendency to heavy foliage, so I would suggest heavy pruning. It is decidedly a winter apple. I think it is possibly one of the longest keeping apples in the cellar or cold

storage that we can produce at this time, and it is a recognized apple, as Michigan found at the Land Show this year.

As to commercial varieties, I would possibly leave it out of the list of three, but very few of us have commercial orchards with three varieties, our tendency is to get too many instead of two few. Certainly in a list of five I should place the Northwestern Greening, giving it fourth place there, and I would by all means recommend heartily in our section of the country the old Northwestern Greening, as it will surely prove worthy.

MR. G. J. KELLOGG.

I think the finest presentation of this variety was by the last speaker, backed up with the apples that he has picked this year of that variety. There is one thing certain about the Northwestern, you must spray, or you will get imperfect fruit. In the first place, you have got to be on light soil; as my boy says, in the Southern part of the state we have not much good apple soil. If I had gone into the hills back of the cemetery at Janesville, established my orchard. I might have been a millionaire by this time, but I went onto the prairie and on that prairie it is not a success.

Now, I consider the Northwestern as worthy a place in the five and three commercial varieties. It must be in a favorable location. It does not succeed on low, black, prairie soil, it needs white oak and clay ridges, especially in our farmer's orchard. Woodman in Rock county writes me that it is only fit for kindling wood. He is on prairie soil, six miles from my own home and the Wolf River and the Windsor and most of the varieties are succeeding in his orchard, but I do not think he ever sprays, that is why the Northwestern went back on him. J. W. Porter of Cambridge says that it is a success on his farm, while I have seen some on that very orchard, a heavy crop and hardly a perfect apple in the whole lot. I was there to get some to send to St. Louis, and there was not a perfect apple, while there were twenty-five trees loaded with Northwestern Greenings, they had not been sprayed. There is the secret of its success, you must spray and take care of it. In Robert Schultz's orchard near Lake Mills it was formerly a failure, but now his son is in the Short Course and they spray and it is a success. Last season he made a very fine report of

the variety. The farther north you get it the better it does, unless you get up toward the North Pole where it is not hardy enough. It is not as hardy as the Duchess, but it is worthy a place in every orchard. It is losing favor in Minnesota, they are going back on it a little there. At Spokane there were thirteen growers who exhibited the Northwestern Greening; in 1323 plates there were thirteen that were Northwestern Greenings, but they were no better than we have, in flavor we know they were not so good; they were as large, but I think we can beat them in quality, even if it is a poor quality. I will put it in the best five, and I would name the best five, I would say Duchess, McMahan, Wealthy, Fameuse and Northwestern, and the best three, Duchess, Wealthy and Northwestern Greening.

Mr. Cheney: I desire to know something about it for the benefit of the people of our county. We have in our county jack pine regions that have good soil for certain things; we have ridges of good clay loam soil, sand loam soil and we have ridges of heavy clay soil. Now, I would like to know two or three things about that; First, will this tree do equally well on all soils, (leaving out of account those places having hardpan near the surface).

Mr. Palmer: I have eleven Northwestern trees where there is a little sand on the top. They have borne twelve to thirteen years, they have borne heavy crops since they were seven years old on that soil and the trees are the largest of any trees I have in the orchard. There is a little sand on the top, it is mostly clay soil.

Mr. Bingham: From our observation of the trial orchard in Barron county I consider it exceedingly doubtful if the Northwestern Greening will ever be a success in Barron county. My experience with the Northwestern Greening is this, we shipped about 500 barrels of Northwestern Greenings and we found that we could sell McMahan, Wealthy, Snow, Newell anl all other varieties of the orchard by the man's looking at those apples, but no commission firm in Chicago would tackle 500 barrels of Northwestern without first taking a sample and feeling of the market, and the fact that some of them have found out that they rot around the core has given it a black eye in the market.

Mr. Kellogg: A gentleman inquired in regard to different kinds of soils, I do not think he has been answered.

Mr. C. L. Richardson: I know of no place in Chippewa county where the Northwestern is succeeding on gravel or sandy soil; it is only on clay soil that at the present time the Northwestern Greening has succeeded. We do not have much hopes of making it succeed out of that territory.

The President: Mr. Melville is pretty well up toward the territory of Prof. Cheney and perhaps he can give the desired information.

Mr. Melville: I like the Northwestern Greening, I invariably take people into my orchard to show them the Northwestern Greening, but I do not believe in planting an apple that you cannot sell to the same man twice. I do not believe in planting an apple that I cannot recommend.

The President: I do not think we have actually touched on the hardiness of this apple; I would like to ask Mr. Melville in regard to the time when his trees were injured, what particular year was that.

Mr. Melville: It was about seven years ago. My trees were eight years old, it was the second year I planted them. It is pretty difficult to tell whether one has the right variety, and when people say they have the Northwestern Greening, they may not always have it.

Mr. M. S. Kellogg: I would like to ask Mr. Bingham what his observation has been as to the relative hardiness of the Northwestern Greening compared with the Duchess and Wealthy.

Mr. Bingham: I think the Duchess and Wealthy show off better as far as hardiness is concerned, than the Northwestern Greening.

Mr. M. S. Kellogg: Are they a quarter more hardy?

Mr. Bingham: Yes, I think I am safe in saying that they are. I think the Northwestern showed up in pretty bad shape, no good in fact, in the Barron orchard.

Mr. Palmer: The Northwestern is a tree that roots very deeply, and we have some other trees of that kind and such winters, I think, are likely to hurt those trees worse than they will others that do not. We noticed that same winter we spoke of the hickorys were hurt, they are a deep-rooting tree and I

think they are liable to be hurt such winters worse on that account.

Mr. Muhlenkamp: What kills our trees is the steady northwest wind for two or three weeks. I have watched the Northwestern Greening pretty closely and if we have another winter like the years 1894–95, there will be a lot of dead Northwestern Greenings in our state. At the same time I will plant it.

The President: We will now call on some of our friends from the other states. I think we have Mr. Wallace here, we will ask him to tell us about the Northwestern Greening in New York.

Mr. Wallace: It is not grown with us so much as the Rhode Island Greening; the Rhode Island Greening is one of the leading orchard varieties in New York state.

Mr. Pratt (Michigan): I have noticed since I have been here that you have a good many varieties that we do not have in Michigan. I am not acquainted with very many of yours, only two that you commonly grow and those are the Duchess of Oldenberg and Wealthy. I have also noticed this morning in your discussion of the Northwestern Greening that it is adapted to some localities, and some it is not. I believe that horticulture is becoming more of a science every day; that we have to learn what is adapted to one locality and what variety is adapted to another. We are learning that slowly in Michigan, and especially in the southern part.

Mr. Melcher: I had the pleasure of visiting the Michigan exhibit at the Land Show; it may have come from the northern section of the state, I do not remember the county, but they had as many boxes of Northwestern Greening and Wolf River as any other, and they seemed to be proud of it.

Mr. Cady: Mr. Kellogg has spoken of the Northwestern in Minnesota; I think it is losing favor quite rapidly, but it is with them about the same as with you here, the fellow that has the right sort of land and right sort of location for it is getting a good crop and likes it, the fellow that has the wrong soil objects to it; Wisconsin and Minnesota are both large states and there are probably locations that are not fit for the Northwestern. Perhaps it is better in making up a list, to make a list for different sections of the state, varieties adapted to that section, better than to give five or three varieties for the whole state. A few years ago we put a barrel of the Northwestern Greening

into the cellar and kept them until some time between the 1st and 10th of June, and they came out in good shape.

The President: I will call attention to the fact that the Northwestern Greening sells on its appearance rather than reputation. I think we rank red apples too highly; the Northwestern Greening will sell on sight better than any red, so will the White McMahan.

SPRAYING

ARSENATE OF LEAD.

The President: We will now be glad to hear from Mr. Tuck, who will give us a ten minute talk concerning arsenate of lead.

Mr. Tuck: I might add a word about the Greening apples. I have been at every exposition of apples pretty nearly at horticultural meetings from the New England show to the National show at Spokane, and I have not seen any better Greenings than right out here on those tables, all the way around. Some of the red apples at Spokane were a little bit larger and better looking, but even so, I do not believe they tasted much better.

What I did want to talk to you about this morning is arsenate of lead; I talked to you last summer on lime and sulphur. I am going on the supposition that you use arsenate of lead. Any farmer who is not spraying with arsenate of lead for codling moth or curculio is running desperate chances of soon losing his orchard. There are two kinds of arsenate of lead and only two, two definite chemical formulae. I have here a solution of sodium arsenate and here a solution of lead acetate. I will precipitate these to what is known as a concentrated solution. In so doing I am able to press the water out of my solution easily and give you a high percentage of arsenic oxide, but I want to show you that is not the proper way to make arsenate of lead. (The speaker here illustrated methods of mixing.) On examination you will see that is exceedingly coarse in structure, in that way it loses its spreading power, it will not spread over the leaves. When a man goes around and guarantees you high percentage oxide arsenate of lead, he is either giving you an acid arsenate of lead, or he is giving you a solution more concentrated which lessens its covering qualities. There are only two kinds of

arsenate of lead, there is the acid kind and the neutral; the difference is that one contains an acid atom in its molecule and it will surely break up if it is not combined or neutralized by the lead, it also contains a lower percentage of lead. The neutral kind is absolutely neutralized by twice as much lead present, so that there can be no breaking of the molecule whatsoever and there is no danger of injury to your trees after it falls onto the ground. That has been the strongest point that has ever been put out in the states of Washington and Oregon where the alkalinity of the soil has the tendency to break up any chemical of any kind. The proper arsenate of lead for a man to buy is that which guarantees you 12½ per cent arsenate oxide. A man that guarantees you higher that 12½ per cent arsenate oxide in a test must be doing one of two things, either he is giving you an acid arsenate that will burn your foliage and injure your trees in time or he is giving you an arsenate which has made the concentrate solution and you are not getting full value, it is not the properly made stuff. In time that will get down in your settling tank and pack hard, and the next morning, of if you let it stand over Sunday, you will have hard work with your agitator in the tank. The other will settle in time, but it will never settle hard, the slightest agitation will throw it immediately into solution in your barrel. This has been a matter of experiment for years. In fact, I am given to understand that arsenate of lead made in this way, containing 12½ per cent arsenic was used on the Wausau orchard las year and everybody has heard of the wonderful results there, less than one per cent wormy fruit. The whole thing is, if you are going to spray, go out and buy the best materials, if you buy arsenate of lead, buy from a reputable firm, no matter if it does cost a half a cent more, because what is $5.00 a year to a man that is getting $600 an acre for his fruit?

Mr. Foley: Is there any one who can tell how often this arsenate of lead was used in the Wausau orchard, how many applications this year?

The Secretary: Three applications this year. In regard to arsenate of lead in the Wausau orchard, we have used a new brand each year. We used Disparine the first year, Swift's the next, Graselli's the next year, Sherwin-Williams this year and next year we will use Vreelands. We are going to be impartial, and I want to say that after studying the matter closely, I can-

not see any difference between one compound and the other in regard to its effects on the codling moth in the Wausau orchard; one has been as efficient as the other and none of them has ever injured the foliage as far as I can see. It is fair to say that the material used has always been contributed by the manufacturers, for which of course we are duly thankful, we appreciate that compliment; they have contributed very generously indeed.

In regard to the quantities used, I have never used as much as the manufacturers recommend, or as much as is commonly recommended in bulletins. The amount that we have used is about two pounds to 50 gallons, sometimes two and a half pounds, and we never have any wormy apples.

Mr. Crawford: Is Paris green used very much for spraying?

The Secretary: It is not used so much now as arsenate of lead. We have never had any check in the Wausau orchard; by that you will understand, we have not reserved any trees that were not sprayed, so it is barely possible that there would not have been any codling moth, any wormy apples anyway, but we have never had any there. I doubt if there was one per cent of wormy apples in the Wausau orchard this year, and the effects with spraying with Bordeaux have been very marked indeed, the crop is practically free from scab.

Mr. M. S. Kellogg: Are you sure you catch the curculio with the arsenate of lead?

The Secretary: I cannot say positively, but I think we have reduced the injury.

Mr. Kellogg: In my opinion it is practically impossible to eliminate the curculio with the poison, although I may be mistaken.

The President: I would like to say that after two years experience I am well satisfied that spraying with either Paris green or Arsenate of lead reduces the number of curculio and gougers very materially.

Mr. Palmer: I have sprayed this year and last year on the Duchess trees where the curculio work the worst, putting the poison on before the leaves start, and I think it has had a pretty good effect, at least I did not have any curculio.

Mr. Tuck: Mr. Quaintance of the U. S. Bureau of Entomology has recently written a bulletin on Deciduous Fruit insects wich will answer all those questions. He states that arsenate of lead is an absolute control for the curculio and gives

the evidence from the farm where he made his experiments, and also codling moth.

The Secretary: Should we mix the arsenate with the milk lime?

Mr. Tuck: Yes.

The Secretary: Is it not sufficient to pour it into the Bordeaux?

Mr. Tuck: You can put it into the Bordeaux afterwards, only, if you put it into your lime before putting it into the Bordeaux mixture, your arsenate of lead will remain longer in suspension.

A Member: Can you give us some recommendations in regard to Bordeaux mixture?

Mr. Tuck: For a 4-4-50 Bordeaux mixture, the first recommendation I can give you is to slake the lime carefully, that is an important point, do not brown your lime, get it carefully slaked, then dilute it to 25 gallons, dissolve your blue stone and dilute it to 25 gallons, then pour the two solutions together, pour the solutions simultaneously together.

Mr. Bryant: May I say a word in regard to the application of arsenate of lead for the plum curculio? Our Illinois entomologist tells us that the plum curculio early in the season, before the apples are of any size, feeds upon the leaves, that the effect of the application then is to poison them when they feed upon the leaves, not by spraying the fruit.

Mr. Tuck: The first spray of arsenate of lead is the most effective spray, most important, just before the blossoms fall, just before the cup of the calyx closes, to get some of the poison into the cups of the calyx will do away with probably 95 per cent of wormy fruit.

LIME SULPHUR AS A SUMMER SPRAY.

PROF. ERRET WALLACE, Cornell Univ.

Before beginning my paper I would like to say a few words concerning the reason why a certain Wealthy tree had been injured by the Bordeaux mixture while the adjoining trees had not.

There are three or four principal factors that are likely to control Bordeaux injury either to fruit to foliage, one is weather

(1) (2) (3)

Showing three stages of development of apple blossoms and fruit and best time to spray.

No. 1. Right for 1st application, Bordeaux.

No. 2. Right for 2nd application, Bordeaux and arsenate of lead.

No. 3. Right for 3rd application, Bordeaux and arsenate of lead.

conditions following the applications; another is the method of preparing the mixture and both of those factors seem to be eliminated from this case. There is another, the condition of the tree at the time it was sprayed, the condition of the foliage or the fruit, or the variety, either natural or artificial conditions. I was called on to diagnose a case in Western New York this summer of severe Bordeaux injury on foliage that occurred from early spraying, and I found that the leaves had been killed quite extensively and especially in patches over the leaves. I examined microscopically a large number of those killed areas on the leaves and found in every case that particular surface of the leaf had been previously attacked by the fungus and it had evidently destroyed the protective cuticle of the leaf, making it more susceptible to Bordeaux injury, and I found a difference in the varieties of trees; trees that were more susceptible to scab also had been more severely injured in this way. I do not know positively that the Wealthy is more susceptible to scab on the leaves than the other trees that were in question in this case, but it simply shows that there are a great many factors like that that might explain an apparently contradictory case of this kind.

The use of lime sulphur preparations as a substitute for bordeaux mixture in controlling fungous diseases of plants is a very live topic among fruit growers at the present time. Bordeaux mixture has in the past been recognized by practically all authorities as the leading fungicide, and though very efficient it has in many cases given considerable dissatisfaction on account of the injury to fruit and foliage resulting from its use. Bordeaux injury has been carefully studied by investigators, for several years past. All agree that many cases of injury may be due to carelessness in making or applying the mixture; yet frequently such injury is without doubt due to certain weather conditions following the application, and may occur after all known precautions have been taken. Those wishing to follow this phase of the subject further, are referred to Bulletin 287, N. Y. (Geneva) Agr. Exp. Sta., '07, and Illinois Bulletin 135. The authors of these bulletins agree that rain following within a few days after the application of bordeaux mixture is likely to induce injury. This fact places it largely beyond our control. We cannot afford to delay the application until after the rain for it is *before rain* and *not after* that the spray should be applied. I wish to emphasize this point very strongly. Do not wait for wet weather to come

and pass by for fear that the rain will wash off the spray. There could be no more certain way to defeat the object of spraying than this. Remember that each scab spot starts from a spore of the fungus which can germinate only in the presence of moisture. It is as impossible for these spores to germinate on a dry leaf or apple, as it is for a wheat seed to germinate in soil devoid of moisture. We find that these spores can germinate in four or five hours. Any infections thus started during a day or less of wet weather, will continue to develop regardless of any spray that might be applied the day after the rain.

This being true it would be a decided advantage to know of some efficient spray that can be applied when it is most needed without danger of injury. Thus far there are strong indications that some form of lime sulphur preparation will in the near future satisfy this demand. We have in use at present several distinctly different kinds of lime sulphur preparations. First the home boiled solution prepared in dilute form for immediate application as used for scale. Second, the self-boiled mixture as prepared by Professor Scott, Bureau of P. I. as a summer spray for peach rot and other fungus diseases. Third, the commercial concentrated lime sulphur solutions, and fourth, the home boiled concentrated solution as prepared by Cordley of Oregon and Stewart of Pennsylvania. Aside from these some proprietary preparations such as Pratt's sulfocide are now on the market. Experiments up to the present time seem to indicate that each of the above mentioned preparations has fungicidal value. Just what form will prove best for summer spraying yet remains to be determined. The preparation and treatment for each disease must be worked out individually. For example, while self-boiled lime sulphur may be the best remedy for peach rot, the commercial or home boiled concentrated solution may prove to be most desirable for apple scab. There is also great variation in the concentration required for different diseases.

The experiments at Cornell during the past season were limited to the commercial solution. They were carried out on the farm of L. B. Frear near Ithaca, New York, under the general direction of Professor Whetzel of the Department of Plant Pathology. For the work on apple scab, the experimental plat consisted of a block of Rhode Island Greenings and it was so arranged that we had various combinations as to time and number of applications with both bordeaux and lime sulphur. We used the Niagara

Brand, heavy grade, i. e., containing the sediment, diluted 1–30. No comparison of this with the clear solution was made this year. Arsenate of lead was used with both bordeaux and lime sulphur three pounds to fifty gallons, and the application was very thoroughly made with a gasoline power sprayer using quite high pressure, 125–150 pounds. Since we were uncertain as to what the results would be, only a small number of trees were sprayed with the lime sulphur solution. The experiment was not therefore ideally laid out, but the results were so striking as to make them of value. The table summarizes the condition of the crop from plats variously treated.

Table Showing Comparative Results of Spraying During 1909 with Bordeaux and Lime Sulphur.

Treatment.	Sound fruit. per cent.	Russeted fruit, per cent.	Scabby fruit, per cent.	Wormy fruit, per cent.
Unsprayed	2.5	29.7	42.3	25.0
Sprayed lime sulphur 1 to 30 with arsenate lead	5.2	3.7	3.6	1.5
Sprayed Bordeaux with arsenate lead	9.9	82.2	3.0	3.3

Table Showing Comparative Value of the Different Times at Which the Applications Were Made in This Particular Experiment, 1909.

Treatment.	Sound fruit, per cent.	Russeted fruit, per cent.	Scabby fruit, per cent.	Wormy fruit, per cent.
Spray Bordeaux only before blossoms open	6.6	33.4	41.1	14.2
Sprayed once after blossoms fall, lime sulphur	60.7	5.7	5.7	1.9
Sprayed once after blossoms fall, Bordeaux	8.5	77.4	4.5	6.6

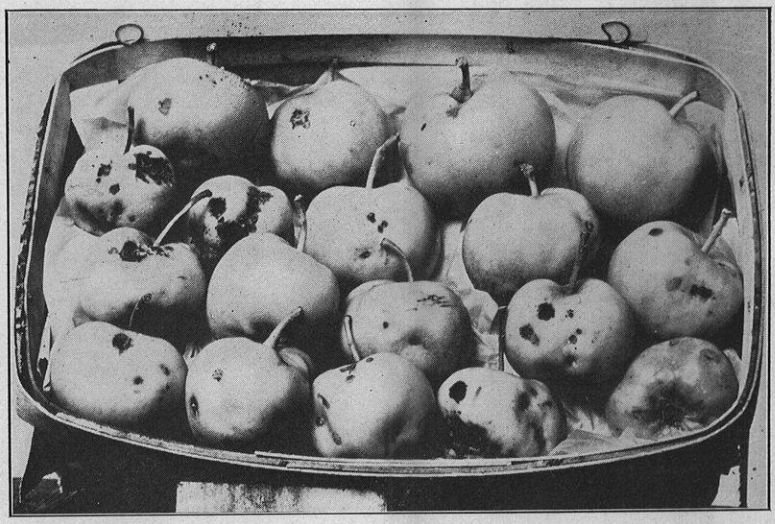
The attack of scab was not as severe as sometimes occurs, owing to the dry season. Forty-two per cent, however, of the unsprayed fruit was more or less affected. This was reduced by Bordeaux 3–4–50 with arsenate of lead to 3 per cent and by lime sulphur diluted 1–30 with arsenate of lead to 3.6 per cent. In this case the application just after the petals fell was the all important one and controlled the scab almost as well as where more were given. It would not be safe, however, for growers to depend on a single application of the fungicide since the season being dry

was especially unfavorable to later infections. Ordinarily about three applications will probably be necessary to control apple scab in New York State. One before the blossoms open, another after the petals fall, and a third from ten days to two weeks later.

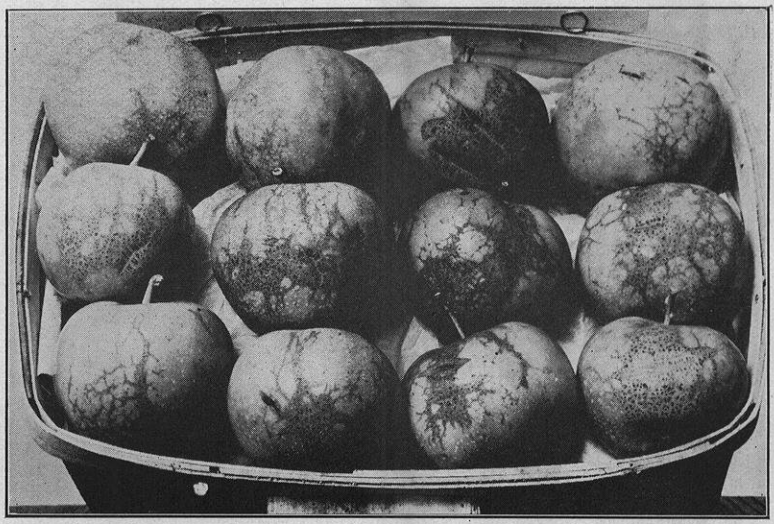
The table shows that eighty-two per cent of the apples sprayed with Bordeaux were russeted; and many quite severely. For this reason we had only 9.9 per cent of sound fruit in the plats thus treated, while on those sprayed with lime sulphur 52 per cent were free from any blemish whatever. The fruit was entirely free from any form of spray injury. The apples were much more perfect in form and color and possessed a waxy finish, giving the fruit a quality superior to that otherwise treated.

We do not wish it to be understood that this difference should be expected in every case. It has already been pointed out that Bordeaux injury may or may not occur, depending largely on weather conditions. If we can avoid the risk of its occurrence by the use of an equally efficient substitute we are certainly benefited by so doing. I am well aware that some growers claim that bordeaux injury can be entirely avoided if certain precautions are taken. Even if this were true it would not alter the nature of the case. The fact remains that a large percentage of the apple crop for 1909 of New York State was russeted to an extent that would render it unfit to be classed as No. 1 fruit in a first class market. The loss occurred and will occur each year while bordeaux mixture is universally used. If this loss can be avoided by the use of a substitute that gives as good results and requires less skill, we are certainly gaining one point.

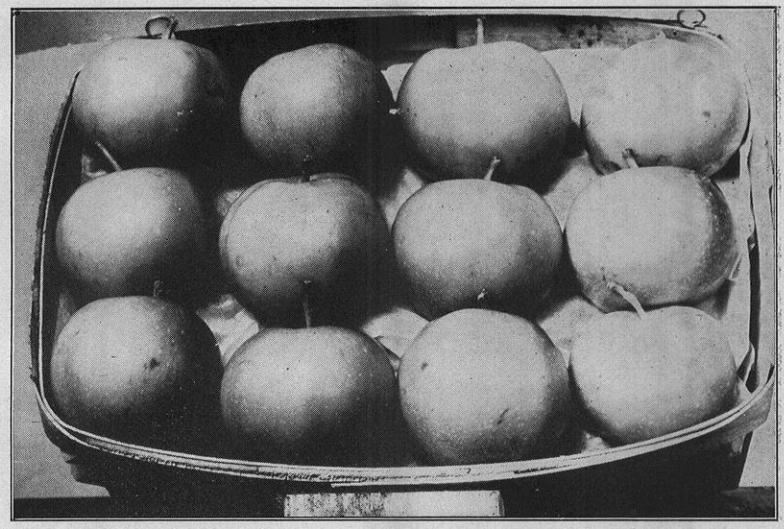
The use of arsenate of lead with lime sulphur solutions to control the codling moth has been a much discussed and unsettled question. When mixed, a chemical reaction takes place and we are not, therefore, spraying arsenate of lead onto the trees, but a new arsenical compound formed as a result of the chemical change. It has been feared that this reaction would destroy the insecticidal value of the arsenate and that it would cause burning of the foliage. In our experiments there was no foliage injury whatever, and that its insecticidal value was not decreased is evident from the fact that the wormy fruit at picking time was reduced from 25to 3. 3per cent on the bordeaux and 1.3 per cent on the lime sulphur plats. It is possible that other arsenicals could be used as advantageously as arsenate of lead. Professor Stewart of Pennsylvania favors the use of white arsenic added as



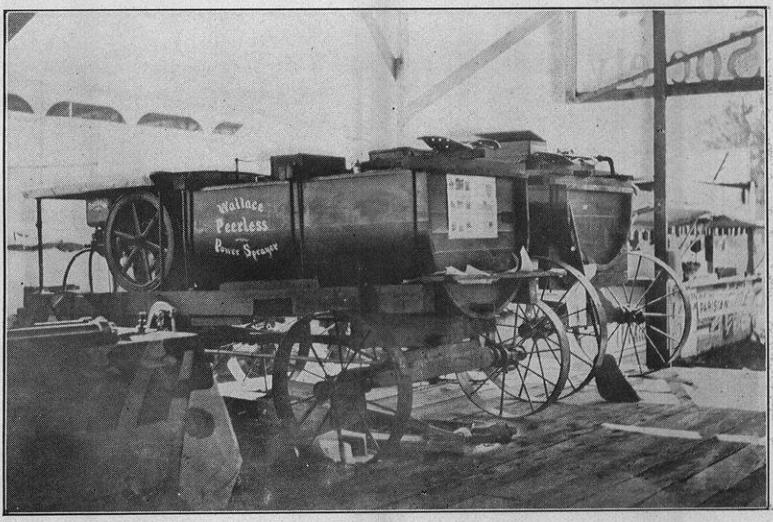
Unsprayed.



Sprayed with Bordeaux and arsenate of lead.



Sprayed with lime, sulphur and arsenate of lead. From photographs furnished by Prof. Wallace.



Power sprayers, State Fair Exhibit 1909.

arsenite of lime. He believes there is no advantage in using the more expensive arsenate of lead since it is broken up anyway. This is certainly worthy of trial, but so far as I know has not been tested in actual practice.

I have given, thus far only a brief account of our own experiments conducted in one orchard, and for a single season. This should not be considered alone but in connection with the work that has been done by others. It is a remarkable fact that the reports from those who have properly tested lime sulphur for apple scab, are almost universally favorable. Professor Cordley of Oregon, has experimented along this line for the past three seasons. Here are abstracts from two of his letters written to Professor Whetzel:

Feb. 18th, 1909. "Replying to your letter of Feb. 8th, will say, that we have used lime sulphur spray as a substitute for bordeaux in controlling apple scab for the past two seasons with most excellent results. Not only have we a considerably larger percentage of fruit free from scab by the use of lime sulphur, but there is also the advantage that no spray injury is produced as by the use of bordeaux."

In another letter dated Nov. 30th, '09, he states that the attack of scab during the summer of 1909 has been light; but that "the results, such as they are, verify the conclusions arrived at as the result of the previous two seasons' work, that is, the lime sulphur has given decidedly better results than bordeaux, and has produced no injury whatever in the fruit, even when used strong enough to injure the foliage considerably.

We also have reports of Professor Scott of Washington, D. C. In Circular 27, Bur. Pl. Ind., he reports that the self-boiled mixture prevented early infections of scab, but heavy rains soon washed it off and allowed some late infections to take place. The commercial solution adhered better and remained effective longer than the self-boiled. The use of arsenicals in the commercial lime sulphur, he states is an unsettled question. They are broken down by the sulfids and theoretically would be injurious to foliage.

In a recent letter concerning the work of the past summer, he writes "in our Virginia work we used commercial lime sulphur at the rate of 2 gallons to 50 gallons of water and 2 pounds of arsenate of lead, with only a very slight injury to the foliage. The same strength of mixture with Paris green burned the foliage

badly. The mixture at this strength controlled apple scab, but unfortunately scab was not very bad in any of the orchards treated. I am not sure, therefore, that the mixture would control the disease under conditions favorable to a severe outbreak. The self-boiled lime-sulphur prevented scab and leaf-spot just as well as the commercial preparation and the foliage sprayed with this mixture was in better condition throughout the season than that sprayed with the commercial brands. Here, again however, I am in doubt because the conditions were not favorable for a severe outbreak of scab and I would not consider results conclusive."

In addition to these we have favorable reports from Professor Brooks of New Hampshire, and Professor Battie of Washington. Quite a number of growers have used lime-sulphur as a summer spray during the past season and their reports are almost universally favorable. This, I think, summarizes briefly the most important evidence concerning this very important subject. We do not wish to urge any one to rush hastily into a new practice. We are not absolutely sure that the results will be as favorable every year as they have been in the past. They may vary with weather conditions. We do not wish to make positive recommendations. All we can do at present is to lay the facts before you and allow each individual to decide which risk he will choose to take. The whole problem is as yet in an experimental stage, but the indications are certainly favorable. There is much that we do not know, but give us time and a chance to work and we are going to find out.

The President: What about convenience in handling, and how does it compare in price with the Bordeaux?

Mr. Wallace: Is there any one here that can tell me about how much a gallon of Bordeaux mixture, as ordinarily prepared for spraying for apple scab would cost?

Mr. Bingham: About two-thirds of a cent a gallon.

Mr. Wallace: The commercial solution, that we use, and I believe the solutions that are put up by most of the companies are sold for about 20 cents a gallon, buying them in 10-gallon casks. Now, these are diluted 1–30, that would make the cost about two-thirds of a cent per gallon of your spraying mixture as you put it on the tree, that is not including the arsenate of lead. I think we can make Bordeaux mixture a little cheaper than that in New York state.

Mr. Wallace: About two-thirds of a cent would be what this

would cost, diluted 1 to 30, and of course the trouble of making would cost, diluted 1 to 30, and of course the trouble of making it is nothing, you simply dilute it. Now, if any of you choose to go to the trouble of making a home-boiled concentrated solution you want to adopt some very uniform method for preparing the spray. I would advise any one to write to Pennsylvania State College for Bulletin 92, by Prof. Stewart on the preparation of lime-sulphur. He prescribes a method of preparing a home-boiled concentrated solution that will cheapen it as far as material is concerned, whether it would cheapen it as far as work is concerned, if you concluded to pay for the work, I cannot figure that out.

Mr. M. S. Kellogg: I would like to ask if the union of the arsenate of lead and these other arsenicals is as complete with the lime sulphur as with the Bordeaux mixture, is it as sympathetic?

Mr. Wallace: They seem to be a little more sympathetic because there is a chemical reaction takes place very rapidly when you mix the two together and I said in my paper, you are not putting arsenate of lead on your trees, but a new compound form of the sulphates, probably some that are unknown, but all we can say about it is that in this case and in all the cases which I have heard reported thus far, that we have no bad results from this chemical reaction, and the control of the codling moth has been good.

Mr. Kellogg: Do you get the same arsenical result, the same poisonous result?

Mr. Wallace: Well, we did this year, certainly.

Mr. Moore: I would like to ask, if you have a change in your chemical compound, in your arsenate, whether or not there is any danger from that becoming more soluble than the arsenate of lead and resulting finally in the arsenical poisoning of the tree.

Mr. Wallace: That is a danger that has been predicted by chemists, and from the theoretical standpoint there would be danger from that point. All we can say is, thus far we have not heard of any such a thing happening in actual practice.

Mr. Moore: Have you used them long enough to be certain?

Mr. Wallace: No, I say, in our own case we have only used it for the past season, but Prof. Cordley has used it for the past two or three seasons, but as I said, there is a great deal that we do not know about this and there is almost nothing that we are sure of as yet.

Mr. Moore: In using your concentrated solution of lime-sulphur, do you use just the clear solution, or do you often find a sediment?

Mr. Wallace: In our experiments we used the solution with the sediment in it, mixed them up and used the two together. The reason why we used that particular kind was that Mr. Freer with whom we were working had already purchased enough of it to do the spraying for the whole season. We do not know yet what the value of that sediment is as a fungicide. We are working along that line now and hope to have some information.

Mr. Moore: You cannot recommend it one way or the other?

Mr. Wallace: No. I do know absolutely that Prof. Cordley of Oregon and Prof. Scott of Washington have used other brands and brands that were only a clear solution, the Niagara put out both, a clear solution and one with a sediment in it, but I know Prof. Scott and Prof. Cordley have used other brands that were in a clear solution and got as good results as we did.

Mr. Tuck: There is nothing very obscure about it, as a matter of fact, lime-sulphur in combining forms pure sulphites and sulphates; these sulphites are of no value as far as anybody can determine, and I believe Prof. Stewart determined they had no value as far as poisoning is concerned, they are not poisons from a chemical standpoint in any way. Prof. Stewart of Pennsylvania sprayed some trees with this so-called "mud," this sediment, and he stated last year it had no value, I believe, did he not?

Mr. Wallace: I think that is the conclusion that Prof. Parry has come to with reference to the value of the sediment as a scalicide. Now, of course no one knows in regard to the value as a fungicide; the principle is entirely different; in controlling scale you are controlling animal life; if you are controlling fungi, you are controlling plant life.

Mr. Tuck: You think there is some value as a fungicide?

Mr. Wallace: I do not know.

Mr. Moore: That is the point I wanted to bring out, whether the sediment had any value as a fungicide?

Mr. Wallace: I have some opinions on that line, but I would not like to express them until I am more certain than I am at present.

The President: Does not the lime-sulphur kill by contact?

Mr. Wallace: Yes, it kills by contact, it is not a poison.

The President: This other question as to comfort in handling, is it fully as disagreeable to handle as the ordinary Bordeaux mixture?

Mr. Wallace: I did not mind it at all. It is a little uncomfortable if you get some of it in your eyes, makes them smart, but you can see more clearly after they get over smarting.

NOTES ON THE LIME-SULPHUR MIXTURE.

By A. L. HATCH, Sturgeon Bay, Wis.

Perhaps the most salient feature of lime-sulphur as a summer spray will be the probability of its serving as a plant stimulus. If with its use foliage is made more vigorous instead of being depressed or absolutely injured as is so often the case in the use of Bordeaux mixture, its use will mark a great step in advance. If also it will of itself have an insecticide effect upon aphis, thrips and young scale lice it will have a marked advantage over Bordeaux mixture. Both of these are well within the known effects of sulphur and worthy of careful experiments.

In order to be acceptable to fruit growers the spray must be capable of carrying an insecticide so the operation will not need to be duplicated to prevent fungus and insect injury. While chemistry shows the effective part of lime-sulphur spray to be a delicate combination it is not probably much more so than that of Bordeaux mixture. There is probably some form of arsenate that will coalesce in such a way as to be fully efficient, even if arsenate of lead can not be used.

The new form of arsenate brought out by French scientists recently possesses some apparently great advantages over any other form now known and if it will combine with lime-sulphur without discord promises to be the acme of spraying mixtures. For this arsenate it is contended that by substituting iron sulphate for lead acetate in the making of arsenate it is expected to remedy the toxic effect of cumulative sprayings. If by the use of lime-sulphur we eliminate copper from our fungicide and by the use of iron sulphate eliminate the lead from the insecticide a further step is taken toward what is desired.

The general use of kerosene barrels in spraying has established the spraying barrel at 50 gal. This is what we may now regard as the liquid spray unit. Recently I made examination of several bulletins and found that the arsenical units for 50 gal. varied from one and 2-5 oz. to 7 2-10 oz. In other words there were five different quantities mentioned for the same purpose. Surely so wide a variation shows error somewhere. One professor in discussing lime-sulphur wash as a summer spray suggests that the stock solution be measured by Beaume's scale—28 degrees being a strength to require a dilution of 18 to 1. Here again we should meet with difficulties. It is not easy for common fruit growers to obtain hydrometers with Beaume's scale and it is not desirable that it should be used. The specific gravity can be better determined by weighing. Since, however, authorities differ in the amount of lime desirable to use in dissolving the sulphur it is evident the specific gravity of the resulting solution wash must vary with the amount of lime used. As the dominant force is sulphur and not lime it is evident that here too we need a definite sulphur unit. With the amount varying from 3-4 lb. to 1 1-2 lbs. of lime for one of sulphur there can be little uniformity of results. Unless shown to be better otherwise equal weights of lime and sulphur and so made as to have a specific gravity of 1.25 would give a definite sulphur unit. Whoever establishes definite spray units will confer a benefit on horticulture.

HOW TO MAKE BORDEAUX MIXTURE.

M. W. RICHARDS.

You undoubtedly thought it queer when you glanced over your program and again saw there the subject of Bordeaux mixture. This subject, however, is like numerous other horticultural subjects, it never grows old and we never know all about it. Formulae for Bordeaux Mixture and descriptions for making it have been published so often that the subject ought to be well understood; yet many inquiries are made regarding it every year and very much trouble results from an improperly made mixture.

In making Bordeaux Mixture the first thing to take into con-

sideration is the materials. It is made of Copper Sulphate commonly called blue-stone or blue vitrol, stone lime and water. To make a satisfactory mixture the best materials it is possible to obtain should be used. Copper Sulphate often contains small percentages of iron sulphate but rarely in excess, or in sufficient quantities to interfere with the efficiency of the Copper Sulphate. If first class sulphate is bought very little difficulty will be experienced as far as it is concerned. The lime, however, often offers serious difficulties. Lime contains more or less impurities. If the percentage of calcium oxide is high the lime is technically known as a "fat" lime; this on addition of water, slacks quickly and completely and will perform its office in the compounding of Bordeaux Mixture in a satisfactory manner. If on the other hand the lime contains a large percentage of magnesia, clay or sand, it is known as "poor" lime. Such limes slack slowly and incompletely and do not make satisfactory Bordeaux.

Air slaked lime should never be used as mixtures made with such lime are not only extremely injurious to foliage but are less adhesive and do not remain in suspension as long as mixtures made with fresh stone lime. The water used in preparing the mixture has very little to do with the efficiency of the Bordeaux. In spraying large commercial orchards large quantities of water are necessary and it is essential that the supply be ample and conveniently located.

For the commercial orchard, wholesale quantities will be needed and the local drug store should not always be depended upon to supply the demand. Buy your materials from some reliable dealer and in quantities large enough to take advantage of wholesale prices.

The cost of materials will depend largely on the amounts bought, and the grade.

The amounts needed will depend upon the size of the orchard, age of trees, number of times the trees are to be sprayed, and the season at which they are sprayed. On the average, one barrel (50 gal.) will cover twenty, 20 yr. old trees. At the present prices—8c per lb. for Copper Sulphate and 1c per lb. for lime, 50 gal. Bordeaux Mixture will cost about 36c or 1.8 cents per tree. A 10 acre orchard with 104 trees per acre will require 50 to 60 bbls. or from 200 to 250 lbs. Copper Sulphate and the same amount of lime for one spraying. These figures cannot be made absolute because they are based on estimates

and the amount of spray used will vary with the leaf development of the trees.

After the materials are at hand the next thing to consider is the proper utensils which are to be used in compounding the mixture. If only a small amount of spray material is to be made we will need three 50 gal. barrels, 2 large wooden pails, such as candy pails, and a few gunny bags. If the mixture is to be made on a large scale, as for a commercial orchard, larger and more pretentious utensils will be needed. The tanks should be elevated so that the materials will not have to be lifted but may flow by means of gravity. In making Bordeaux Mixture use only wooden or earthen utensils as the Copper Sulphate corrodes metals.

There are numerous formulae for the manufacture of Bordeaux Mixture and they will vary as the use to which the mixture is to be put. The formula generally used and the one we will use as an example is the 4–4–50 formula. It must be remembered, however, that the ingredients of Bordeaux Mixture unite in certain definite proportions and that the proportions are designated by the formulae which should always be followed closely.

In making small amounts of Bordeaux Mixture the quantities of materials called for in the formula are weighed out and the Copper Sulphate is dissolved in water. The lime is slaked and the two then diluted each to 25 gals. They are then poured simultaneously through a gunny bag into a barrel. The resulting mixture is Bordeaux.

If any quantity of mixture is to be made, however, stock solutions are resorted to. Certain definite amounts of materials are weighed out and made up to certain volumes. As 50 lbs. Copper Sulphate made up to 50 gal. water and 50 gal. lime also made up to 50 gal. of water. Then 1 gal. of the stock solution contains 1 lb. of the material. In dissolving, the 50 lbs. are tied in a gunny bag and suspended at the top of a barrel of water. As the Copper Sulphate is heavier than water it sinks to the bottom as it dissolves and the water around the bag is thus always in an unsaturated state. The lime is slaked in a slaking box as in the shallow box it is easier to handle than when in a barrel. The lime should have enough water on it to keep it from burning but not enough to "drown" it. If lime burns or "drowns" all of it does not slake and the stock

solution will be lumpy. In using these stock solutions for the 4–4–50 formula 4 gals. of each are taken and diluted to about 10 or 15 gal. This dilution is done because it has been found that the materials when mixed in a concentrated form make a poor mixture and the resulting Bordeaux does not remain in suspension well. The diluted Copper Sulphate and lime are then poured into a third vessel through a gunny bag sieve and the result is Bordeaux.

Another way of making up stock solutions is by using a saturated solution of copper sulphate. This solution is obtained by using enough of the sulphate in the gunny bag which is suspended in the stock barrel so that the solution will become saturated. It has been found that 1 gal. of a saturated solution of at the average temperature contains 3 lbs. of sulphate. The lime stock solution is made up by slaking no definite amount of lime and making up to no definite amount in the stock barrel. The mixture is made by taking 1 1-3 gal. of the sulphate solution diluting it and mixing it with an amount of diluted stock lime. The resulting mixture is then tested with potassium ferro-cyanide or as it is commonly called yellow prussiate of potash. When a few drops of the potassium ferro-cyanide is dropped on the mixture if an excess of copper is present a dark brown precipitate will be formed. More lime should be added if this brown precipitate results. When enough lime has been added to neutralize the effects of the copper no brown precipitate will result upon adding potassium ferro-cyanide. The advantages of this method of procedure are that it is less trouble to make the stock solutions and that they will keep indefinitely with no danger of their changing strength.

In conclusion I will mention a few precautions to be exercised in the preparation of Bordeaux Mixture.

1st. Use good materials.

2nd. Do not use air-slaked lime.

3rd. Do not mix in a concentrated form.

4th. Do not use metal utensils.

5th. Always test mixture for free copper.

6th. Always make according to some well established formula.

If these precautions are observed satisfactory Bordeaux is sure to be obtained.

A SUMMARY UPON ORCHARD SPRAYING EXTENSION.

J. G. MILWARD.

Wisconsin apple growers still find difficulty in applying spraying methods in their orchards, for the control of the codling moth and apple scab. To meet this difficulty, the Horticultural Department of the Experiment Station has for the past two years conducted spraying demonstrations in five counties in the state. Relative to this work, it is important to emphasize the following:

First, the work has been done under actual orchard conditions. Equipment has been selected and methods used such as would be adapted to commercial and farm orchards in Wisconsin.

Second, careful attention has been given to get an accurate estimate of the losses due to attacks of the codling moth and apple scab in unsprayed orchards. A comparison of these results has been made with results taken from sprayed trees in the same orchard and upon the same varieties.

Third, the above has been taken as a basis for recommending spraying as a profitable investment and insurance against attacks of the codling moth and apple scab.

The writer has made estimates of the damage done by the apple worm both upon single unsprayed trees and upon the collected fruit from unsprayed orchards. These tests have included largely such varieties as Longfield, Fameuse, McMahon, Wealthy, Northwestern Greening, Newell's Winter, McIntosh Red, and Wolf River. A crop of about forty barrels of Northwestern Greenings taken from twenty trees in Kewaunee county—unsprayed in 1909—showed about 95 per cent of apples infested with the apple worm. The percentage of unsound fruit in this orchard on Wolf River, Fameuse, Pewaukee ranged from 50 to 95 per cent. During 1908 and 1909, similar tests were made at Richland Center, Richland county; Baraboo, Sauk county; and Oshkosh, Winnebago county. The percentage of unsound fruit on unsprayed trees ranges from 40 to 90 per cent.

Orchard spraying has been done in the orchards where the above conditions were found. A block of trees from two to five acres has been sprayed and the percentage of unsound fruit calculated. From 60 barrels of Northwestern Greenings taken from

R. T. Smith Farm, Oshkosh, 1909. Wealthy apples, unsprayed, showing: 2¾ baskets sound apples; 3¾ baskets unsound.

Field Meeting Oshkosh, 1909. University Extension; Spraying.

sprayed trees at Baraboo in 1909, fifty-four barrels were sound and seven barrels unsound, making a percentage of unsound fruit of 11 per cent. From 145 barrels of McMahons harvested from sprayed trees on the farm of Henry Dworak at Casco, Kewaunee County, 135 barrels were estimated sound and ten barrels unsound, giving a percentage of unsound fruit of 7.2 per cent. At Oshkosh in 1909, on the farm of R. T. Smith the average precentage of unsound fruit on sprayed trees, all varieties, was 6.5 per cent. The average percentage of unsound fruit from unsprayed trees was 81.7 per cent.

The above figures represent only in part the data collected but will give an idea of average conditions. The beginner in orchard spraying must understand that orchard spraying means making a business-like investment and giving close attention to such details as 1, selection of desirable equipment and spray materials, and 2, timeing the applications in accordance with the development of the pests in the orchard.

The following estimate of complete equipment is given using 200 bearing trees as a basis. The reader is asked to notice that all material and equipment is purchased new, and that on the average farm there is considerable chance to economize upon the statement given. The average orchardist shows a tendency to neglect the work by selecting equipment and material unsuitable for the purpose and otherwise neglecting essential details.

Total Investment for Spraying 200 Bearing Trees.

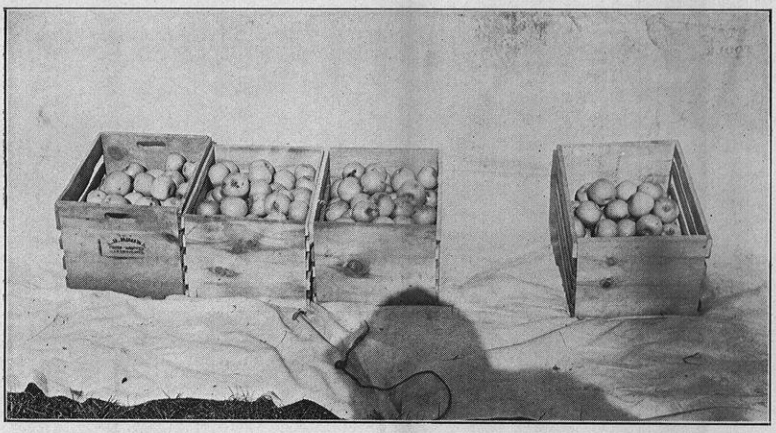
Barrel pump	$20 00
25 feet ½″ hose, 5 to 7 ply	3 00
Bamboo extension rod	2 00
Vormorel nozzle and attachment	2 00
1 pump barrel	1 00
3 mixing barrels	3 00
2 stock solution barrels	1 00
2 mixing pails	20
Blue vitrol, 160 lbs.	12 80
Lime, 200 lbs.	80
Poison	10 00
Total	$55 80
Additional for 100 gallon tank	10 00
	$65 80

VEGETABLE GARDENING.

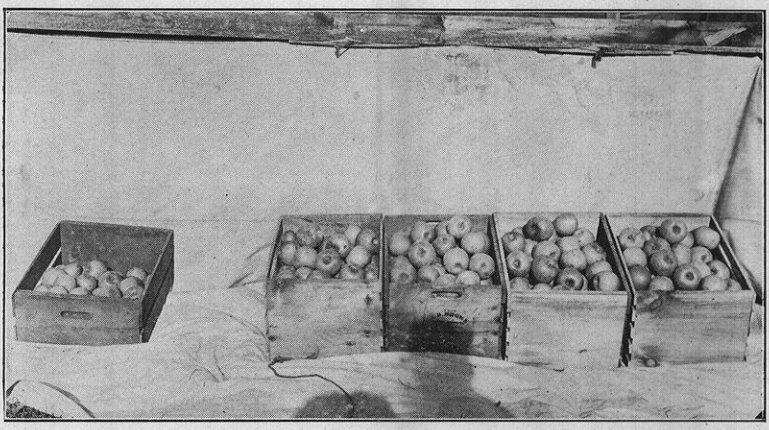
THE FARMER'S GARDEN.

A. J. PHILIPS, West Salem, Wis.

A Mr. I. W. Ingham of Bradford county, Pennsylvania, sent a paper on the above subject to be read at the summer meeting of this Society at La Crosse last summer, which varied so much from my idea of a Wisconsin farmer's garden that I am asked to reply to it. And in order to do so I will have to give some of his main points so my audience can understand this paper. *First.* He says the discoveries and improvements of each member tend to stimulate to greater effort by contact with each other. This I am free to admit is so. *Second.* He claims that a majority of the farmers have poor gardens. I will amend this by this change: that the minority have poor or no gardens. *Third.* He said that the late Waldo F. Brown of Ohio said that a majority of farmers fall below their privilege in not having a good garden.. He answered that by saying that farmers had the privilege of going to summer resorts or to the seaside but they did not go because they had not the time or money to spare. I reply to this by saying that no class of people have more time and money to spend on vacations than the Wisconsin dairy farmers for from my station more farmers went to the Chicago, Omaha and Seattle expositions than did any other one class of men. *Fourth.* He says the field crops are the farmers' main dependence while his garden is not. I reply by saying that no place on the farm of the same size and run by the same expense affords the farmer and his family more of the necessaries and maintenance of his family and friends than does the garden, for when company comes unexpectedly, when threshers come, when corn shredders and silo fillers come, when carpenters or masons come to make improvements or repairs during the summer and fall, what is the first thing his good wife does? She may scold a little on the side because she has not had more time to prepare; then she sends some one for a few groceries; then to help out in supplying a bountiful meal, she gets a move on and sends the hired girl or hikes to the garden herself for the bulk of her supplies, and she usually gets it without first mowing down the weeds



A. D. Brown Farm, Baraboo, 1909. N. W. Greening from unsprayed trees showing: 2¾ crates unsound; ½ crate sound.



A. D. Brown Farm, Baraboo, 1909. N. W. Greening, sprayed, showing: 4 crates sound; ½ crate unsound.

as Mr. Ingham suggests, though I admit in some cases she may have been obliged early in the season to do some hoeing or planting herself in order to have a garden to fall back on. *Fifth.* He says according to his experience a family will eat nearly as much bread, butter and meat and drink as much tea and coffee and consume twice as much sugar when they have a good garden with plenty of pie plant and berries. And he further says a garden is a luxury, not a necessity. This is the story a farmer related to me when I was advising him to plant fruit trees. He said apples did not save anything on a farm. "Why," said I. And I will answer Mr. Ingham the same way. Fruit and vegetables, though they are composed largely of water, are appetizers; they aid in the digestion of heavier foods and preserve the stomach, that necessary organ, to carry a person beyond their three score and ten years well and healthy. *Sixth.* He says some claim a garden saves doctor bills. He answers by saying there is no proof of that as there is more sickness during the garden season than in winter, and says summer complaint originates in the garden. In this statement I think he is wholly mistaken. My own opinion supported by the opinion of a skilfull practicing physician here is that more summer complaint is caused by a lack of fruit and vegetables which aid digestion than by its use. The doctor informs me he dreads the winter cholera when the garden and berries are dormant among his patients more than he does the summer complaint when the garden is at its best. *Seventh.* Mr. Ingham says that farmers don't have good gardens which is prima facie evidence that good gardens don't pay in dollars and dimes, and he further says he has had long experience in gardening and farming and he can say deliberately that he can plow and tend 10 acres of corn at less expense than he can tend a half acre of garden. Well, at my age I had rather for pleasure or profit tend the garden. Mr. Ingham says if he lived near a village so he could sell his surplus from the garden the results might be different. But let me ask after a farmer's wife has supplied the average farmer's family through six months of summer with fruit and vegetables from half an acre garden how much would the surplus bring? I answer, not much. *Eighth.* He says that he once had a rich neighbor that hired an English gardener to make and attend to an half acre garden, that was all he did for six months at thirty dollors a month or $190.00 for the summer. He said that garden was a luxury, and I think so.

That kind of work might do in Pennsylvania but it would not work in Wisconsin. A good Wisconsin farm hand could plant and attend to a garden of that size by using a horse and a garden cultivator by working on it six days in every month, then have twenty days each month to raise other farm crops. That Englishman was either a poor man to hire or he had an awful good garden. *Ninth.* He says a farmer should have as good a garden as he can afford to. I agree with him here. He says fruit trees should not be planted in the garden. I agree in this, too. He said his father damaged his garden by planting cherry, peach and dwarf pear trees around the outside of it. Well, I think such trees with plum trees and a few top-grafted apples around the outside will pay in fruit and pleasure as much as any like amount of land located in any other place on the farm. Mr. Ingham does not mention flowers in the Farmer's Garden, but does say that a nice bed of asparagus on the side will furnish tender, delicious and healthful food in the early spring. Mr. Ingham's idea seems to be that the farmer's garden does not pay in dollars and dimes, but I think it does. I also think in Wisconsin the farmer and his family have something else in view besides the dollars and dimes; they desire some pleasure which is testified to by the finding in so many farmer's gardens, and in the grounds adjoining them, beautiful flowers. For example, the writer has attended funerals in a farming community remote from cities where the coffin of the departed parent or child was profusely covered with flowers that all came from farmer's gardens; there was no dollars and dimes, but it expressed more; it manifested sympathy, kindness, neighborly love and affection. I have in mind a farmer's garden, not an isolated case, but one similar to many I know, where some beautiful peonies are along the front, their deep green foliage is nice when they are not in bloom; then along the outside is or was a long row of dahlias which are beautiful as colder weather approaches; then at one side a long row of sweet peas supported by wire netting at a small cost; then from a half to a dozen rose bushes that when in bloom are so fragrant; then a nice pansy bed for the children to admire and pick and these flowers in addition to the early potatoes, sweet corn, lettuce, radishes, onions, string beans, tomatoes, cucumbers, early and late cabbage, parsnips, celery, a bed of carrots so useful and healthy in a boiled dinner, all work in beautiful to round out the farmer's garden, which,

though it may be a healthful luxury, is in my mind the most pleasurable and profitable cultivated spot on the farm.

Farmers, don't give up the garden.

Mr. G. J. Kellogg: I do not suppose there is a man here that would admit that he had not a good garden. A large proportion of these men are horticulturists, and I know the ladies here would have a good garden anyway. If there are any farmers here that have a poor garden, let me see your hands. I would have in the farmer's garden, on the sunnyside, a row of grapes clear across and I would not have a farmer's garden less than ten rods long, next I would have sweetbrier bushes, and if I could not fill out the whole row with one kind, I would fill out with two or three kinds, then I would have the currants, then strawberry bed, then the vegetables. There is no trouble in that way, with the long garden, it can be cultivated with horses, and if the wife takes hold of it and does the planning and planting, and the boys do the work, it is more often a success than if the old man goes at it.

Mr. Rasmussen: I agree with Mr. Kellogg and do not quite agree with Mr. Philips; the majority of farmers may have what they call a garden, but if they did not have any at all, they would be better off, because it is only there as an excuse, because they do not get any benefit from it, on a great many farms. I know almost every farmer in Winnebago county. Certainly the majority of farmers there have no gardens at all worth mentioning.

Mr. Coe: I would like to have Mr. Rasmussen live in Jefferson county; the farmers there have pretty good gardens. I would not think of living on a place without having a good garden; it is not a luxury, it is a necessity, and we ought to so consider it. It seems to me that there is no spot on the farm that is so profitable as the garden spot. Then too, we ought to grow flowers. Flowers have a refining influence upon the members of the family and a refining influence upon a community. For me, I want my own home to be such that when my children come to leave it, as they may, they may look back to that home as the dearest, sweetest spot on earth, and you cannot have that if you run it entirely on a dollars-and-dimes principle.

Mr. Morse: We have a good garden and I plant it myself and take care of it myself and do not grudge the work. I have done it before breakfast and after supper and we have had a good garden and raise many berries, but the garden part of it does not take any time at all.

The President: We raise a great many peas and people in town wonder why we do not sell them, for we have a surplus, but we can not spare the time to take them to market, but we can and do spare the time to look after our family. As to sweet corn we raise not only enough for the summer but raise enough to put away in the winter. We also pack away green beans for the winter. Our strawberries rotate among other crops and we always have a surplus. I have sometimes wondered if it would not pay farmers to co-operate, for whatever we undertake to raise we always have more than we need. About the only thing we sell in town is asparagus, but we always see that our own family is supplied first.

Mr. Howie: The farmers in my neighborhood as a rule have gardens, there are very few that have not, and the majority have good gardens, so that I believe it is an error to say that farmers do not have gardens.

Mr. G. J. Kellogg: Celery was spoken of. For the last two winters I have gathered my celery crop and put it in washtubs in about three inches of water, there was no dirt on it, and it has kept on growing all winter and becoming more and more tender. I just cover it with paper if the cellar is not dark and it is one of the best ways I know of to keep celery for family use.

Dr. Loope: I am a horticulturist, I am not a farmer; I see considerable of the farmers and I agree with my brother from Winnebago county, that the majority of farmers do not have very good gardens. There are some farmers that have excellent gardens and take care of them. I have a good garden, I cannot tell you what is raised in it, my wife could tell you that better than I can.

The President: I should like to call Mr. Philips' attention to one point, I did not notice that he brought it out; the main point of this paper was to prove that farmers could not afford to raise their own vegetables, that they had better get them from market gardeners. I do not think there are many in this audience that believe that. They all realize that the fresh vegetables and strawberries right from their own garden, lettuce, peas, sweet corn and all our other home grown vegetables have a quality that cannot be had by taking them out of the grocery store.

Mr. Philips: I think I said his talk did not apply to the farmers of Wisconsin, because nine-tenths of the farmers of Wisconsin do not live where they can go to a village and get vegetables, they have to depend on the garden.

CELERY.

H. C. CHRISTENSEN, Oshkosh, Wis.

The large and rapidly increasing demand for celery makes it well worth while for the trucker to give his attention to the growing of this excellent vegetable.

There are two points that especially recommend it to the market gardener—the large cash returns that may be obtained from a small area and its adaptability as a second crop. In our latitude, planting may be delayed as late as the first week in August and still a full crop be harvested; so that land that has been previously occupied with potatoes, strawberries, peas, spinach, carrots and other early vegetables, may be turned to good account by planting to celery. While a muck or deep black loam is preferable for its growth it is not essential and celery of a superior quality may be grown on heavier soils.

Methods of culture vary somewhat. Those which I shall give are those we employ in raising it at Oshkosh. The first thing to be considered is the raising of plants. For early celery, the seed is sown in flats in the hot-bed about the first of March. A soil composed of two-thirds good garden loam, one-sixth well decayed manure and one-sixth sharp sand is used for sowing the seed in. It is run through a half inch mesh sieve so as to thoroughly mix and pulverize the soil. Flats three inches deep are filled two-thirds full. It is pressed firmly and smoothed off with a board. The seed is sown and covered to a depth of one-eighth of an inch with clean sand. The covering of sand lessens the liability to damping off. When the plants have made three or four leaves they are transplanted into flats an eighteen by twenty-two inch flat holding two hundred. Here they grow until ready to set out in the field. Proper attention being given to shading and ventilating in sunny weather. For later use, seed is sown in cold frames with glass or cloth covering and for still later use it is sown out of doors as early as possible in rows one foot apart in finely prepared soil. The seeder is regulated so as to sow the seed shallow, celery being slow to germinate it is sown thickly so as to secure a good stand. A little cabbage or cauliflower is sown with the celery to mark the rows so that they can be wheel hoed before the celery makes its appearance. They are kept weeded and

wheel hoed the same as carrots or onions. They are cut back once or twice to induce a stocky growth, a sythe being used for this purpose.

As most of our celery is a second crop the soil is not plowed, except when following strawberries, but cultivated to a depth of five or six inches. A dressing of well rotted manure is applied in the row before cultivating. A twelve-tooth Planet, Jr. curtivator is used for finishing. This leaves the soil fine and mellow. In setting transplanted plants a trowel or the hand is used, but plants with a straight a-tap root may be more quickly set with a dibble. Blanching with boards is mostly followed. For this method, the plants are set in double rows, that is two rows are planted ten inches apart and a space of three feet between these and the next two is allowed for cultivating.

The plants are set six inches apart in the row. When earth is used for blanching, single rows five feet apart are used so that there may be plenty of soil for hilling.

When planting in hot or dry weather a mulch of marsh hay is placed on the plants. This is removed when the plants have become well established. After setting, the soil about the plants is kept well stirred with a harrow cultivator until the plants have attained considerable size. When a shovel plow is run through the rows hilling the celery slightly. From three to five weeks before the celery is to be marketed the blanching process is begun. For this, ten inch boards are used. Sixteen foot lengths being preferred. These are placed along the rows with a stake at each end to keep them from falling out, the top holding them on the inside. One thousand feet of lumber will blanch about twenty-two hundred stalks in double rows. After the boards are up, a mulch of stable litter is placed between the rows. This keeps the soil moist and does away with further cultivation. Late in the season some of the celery is hilled with earth. After the shovel plow has been run as closely as possible to the celery, without covering the leaves, the stalks are brought into an upright position by bringing the earth about the plant either by hand or with a steel rake. After the first handling, a shovel is used for further hilling. The back of a wooden rake is used to keep the leaves in an upright position while shoveling so as to protect the heart.

It will hardly pay one to attempt to raise celery to any extent without some means of watering in dry weather. An abundant supply of moisture being necessary for a crisp succulent growth.

We use a windmill, tank and piping, applying the water directly to the plants through a garden hose. This is a job the boys delight in doing.

In preparing for market, a sharp stiff knife is used for cutting. The plant is stripped down to the edible portion and the butt end neatly trimmed. It is then tied in one fourth dozen bunches and washed. As all our celery is disposed of in the local market no boxing is necessary.

When storing the celery, the outer stalks are stripped off and the longer leaves trimmed in somewhat. It is then packed closely in pits, which are made by making a frame of ten inch boards fifty inches wide and sixteen feet long with two cross pieces. This is placed on level ground and the dirt within removed to a depth of eight inches and banked about the outside. After the pit is filled, water is run to a depth of four or five inches to thoroughly moisten the roots and prevent wilting. A double covering of boards is then placed over the pits. This will keep out considerable frost and if an extra covering of coarse litter is given, celery may be safely kept here until well after Thanksgiving. In our section it is not considered safe in the ground after the twentieth of October. In cellar storage the plants are not packed so closely, some earth being placed about the roots when setting down.

As to varieties, we use mostly the self-blanching. For the general market we still prefer a good strain of White Plume to any of the various sorts of that variety. Golden Self Blanching is much superior in quality to White Plume but is of slower growth and more susceptible to blight and rust. It also requires a richer soil. For keeping qualities the green celeries excel. Evans Triumph Giant Pascal, Winter Queen, Noll's Magnificent are all good varieties. The green celeries require hilling with earth to blanch properly.

MY EXPERIENCE IN RAISING MUSK MELONS.

WM. NELSON, Oshkosh.

I have had about 14 years experience in raising musk-melons, raising about 6 acres each year. I have tried several varieties, but have dropped all except the Emerald Gem, Osage and Honey Dew, as I raise them only for home market.

I have only had one year experience with the Honey Dew, but I find it a very good yielder, also a good seller, owing to its large size and fine quality; and quality is what we want.

These three varieties each have a deep yellow flesh, fine grain and are very sweet. The Osage and Honey Dew are large sized melons, and we sell them by the dozen while the Emerald Gem is a small melon, which we sell by the basket.

The land upon which I raise melons is mostly sand. I plant the Emerald Gem on the lightest sand, which is very high land and faces the south, while the Osage and Honey Dew seem to do better on a lower and heavier sand.

I have not had good success with the Osage on the high light sand where I plant my Emerald Gem, because in a dry time or dry season they become tought and leathery, also somewhat one-sided. I usually plant about 4 acres of the Emerald Gems, putting about half of them in the same ground where I raise radishes. This land upon which I raise my radishes, I fertilize very heavily with well rotted horse manure, spread broad-cast; then plow very deep, plowing clear to the beam, this being the secret of raising good radishes; because the radish requires a deep soil, and the deeper the soil is loosened the longer the radishes will be. I usually get about $300.00 worth of radishes from this 2 acres.

Now the other 2 acres where I plant Emerald Gems, I fertilize in hills. I plow as you would ordinary ground, harrow it, then make deep furrows with the plow about 5 feet apart. Then I mark across these furrows with a light 3 foot marker, going across the ground where I already have my radishes sown. This furrowing with the plow is far ahead of the old fashioned way of making hills with a shovel, it being much quicker and better.

These furrows are the same width apart as the wheels on a lumber wagon, thus making it convenient in driving through with the fertilizers, as one wheel can run in each furrow.

Now in filling these hills, I have two men on the wagon, the man in front can throw the fertilizer, in the furrow, on each side of the wagon, while the man behind can fill the two furrows, in which the wheels run, putting a good fork-full in each hill.

Next using a spade-fork I mix the fertilizer with the sand; thus,—forming a hill, in the furrow, of course making sure to get the hill in line with the cross-mark; mix thoroughly and have at least 3 inches of clear sand on top of the hill to prevent the

young and tender plant from drying up, in a dry time, as it is apt to do, should you have the fertilizer too near the top.

I get these hills prepared as early in the spring as possible, then they are all ready to plant, as soon as the weather permits. I usually begin planting about the 15th of May, and have planted as late as the 15th of June. I always plant plenty of seeds, having from 8 to 10 plants in each hill; because the bugs are apt to destroy part of them, planting the seeds from 1 inch to 1½ deep. As soon as I finish planting the ground that is in hills, I mark the ground where I have my radishes, the other way and plant that. The radishes make these melons about two weeks later than those in the hills, so that I do not rush them all onto the market at the same time.

Now the land where I plant my Osage and Honey Dew, I plow in narrow lands about 16 feet wide, so as to drain it well in a wet time; as this land is somewhat springy, and the Osage and Honey Dew seem to do much better on this kind of land, since they will not dry out and so grow much larger.

I also furrow this as I did for the Gems, putting 3 furrows on each land, mark it crossways and mix the hills in the same way, only I mark the rows 4 feet apart crossways instead of 3 feet as I did with the Emerald Gems. As soon as I finished planting, I begin cultivating crossways, to fill up the furrows between the hills. If we happen to have a hard rain that forms a crust before the seeds are up I have men rake over each hill with a common garden rake, this kills all the little weeds, just starting around the hills and gives the tender plant a better chance to come through.

As soon as the plants are through the ground, we must watch very carefully for the striped bugs and little black fleas, also for the cut worms, for these are our worst enemies in raising melons. The striped bugs and little black fleas can be kept off the young plants by keeping them well dusted with land plaster and ashes, but I have found no remedy for the cut worm.

As soon as the danger from bugs is over, we thin out the weaker plants and the last time we hoe thin down to two or three plants in each hill.

Of course we all know the more we cultivate the faster and more thrifty the plant grows and it also prevents the soil from drying out. I always cultivate my melons as long as it is pos-

sible to get through the vines, the last two or three times I have them turned ahead of the cultivator.

Now being through cultivating, we can begin to look for the ripe melons. The Emerald Gem ripens first, and we pack in baskets and sell as peaches are sold.

When we first began packing in this way, we used common market baskets, putting 16 melons in each basket and selling them to the stores for 40c to 50c per basket, but we discovered that these baskets were too large for the dealer to sell to private families by the basket, so we now order baskets from a factory to be made half the size of a market basket. This basket holds 8 melons instead of 16 and we get the same price for the 8 melons in the small basket that we did for the 16 melons in the market basket.

The Osage and Honey Dew I sell by the dozen, usually sorting them into 3 grades, according to their size and quality, ranging in price from 60 cents to $1.50 per dozen.

My melons usually bring me about $200.00 per acre.

THE TOMATO.

N. A. RASMUSSEN, Oshkosh.

I am pleased to have the honor of addressing you this afternoon in behalf of the much neglected fruit, the tomato. We have heard discussions of all kinds on apples and berries, and, in fact, almost every kind of fruit grown in our climate, but not one word has been said about the most wonderful fruit of all, the Tomato.

Why do I call it the most wonderful fruit of all? Because it can be grown in more climates, on more kinds of soil, in a shorter period of time, on a smaller space of ground, bring larger returns for what has been given and, after it has been grown, be put to more uses than any other fruit grown.

The tomato is one of the few garden vegetables of American origin holding high rank as a commercial crop which has come into general cultivation within the last century. This plant, because of its relation to the night shade family, was for a long time held in disrepute by gardeners and people generally. For

at least a century after the tomato was familiar to botanists and gardeners it was very sparingly cultivated, and when grown at all, was used chiefly as an ornamental plant. Its cultivation was, therefore, markedly delayed, and it was not until after the strong prejudice that the tomato was poisonous was broken down, that its use became general. The cultivation of the tomato in England and the United States came much later than it did in the countries bordering the Mediterranean. Climatic conditions undoubtedly had much to do with this. Because of the warm climate and otherwise favorable conditions existing in the Mediterranean countries the tomato flourished there. In England, however, because of the comparatively short season and small amount of heat during the growing period, the cultivation of this plant gained slowly. Even now the cultivation of the tomato in Great Britain is chiefly confined to house and protected walls. In the United States, after the plant was once introduced and its poisonous effects were discredited, its cultivation grew rapidly, and now we find it among the most generally cultivated of our garden vegetables. As before stated, the tomato is of American origin. The exact location from which the plants first carried to Europe were secured is not definitely known, but historical evidence indicates that these plants were taken from Peru.

Whether they came from Peru or from China, they are here in Wisconsin and are here to stay. They are very extensively used by all classes of people and for the two reasons following, they may be rightly named "Poor man's fruit". First, they may be bought very cheap in comparison with other fruit; second, if a man has a piece of land 1 ft. square, he may grow them. One square foot of land is large enough for the root and the top may be tied to a stake or a fence or it may be trained to the side of a house where it will be ornamental as well as useful. Three plants handled in this way will supply a family with plenty of choice fruit for the table. As poor men are very numerous in Wisconsin, especially among the horticulturists, let us, poor men, continue to raise and improve this fruit. I may as well add right here that when President Taft's committee gets around investigating the cause of the high prices of food stuffs they surely will find no fault with tomatoes at 50c per bushel, which at this price brings good profit to the grower.

Let us hope in the 25 years to come they will be improved

as much as they have been abused in the 25 years past. You all know that today you can not buy seed from as good a strain of tomatoes as you could 25 years ago. What can be done? Go to your field in fruiting season, mark a few of the very choicest plants and from these plants save the best earliest fruit for seed for the following year; thereby your fruit is improved remarkably. This has been proven by the tomato known in our locality as the "Buckstaff." This tomato was originated by C. D. Buckstaff, Oshkosh, 5 years ago by crossing the Beauty tomato with some other unknown variety, and it has been carefully improved by Mr. Buckstaff and the gardeners at Oshkosh. Although the Buckstaff seed has never been placed on the market, I think today it is far superior to any early tomato grown.

Now we take these seeds we have so carefully selected, sow them for early fruit in hot beds about March 10; when the plants have formed their second leaves we transplant about 2 inches apart each way and again when 3 inches high, this time in cold frames 4 inches apart each way, always keeping the soil well stirred and free from weeds, give plenty of fresh air and, in fact, when the weather will allow, we remove the sash entirely. By the last days of May, these plants are about 12 inches high, have a strong thick stem, are well branched and full of blossoms. A great many of the plants have small green tomatoes on which, if properly handled, we should lose very few.

Now remove these large plants to the field without injury. We take a large heavy knife and cut between the rows of plants both ways, through the dirt and about 1 inch into the manure. In this way, the plants having been well watered the previous evening, a solid mass of dirt and also a little manure will stay on the roots of each plant. They are then lifted, placed on a stone boat, and taken with a horse to the field, which has been previously prepared.

Although they will grow on almost any kind of soil, they prefer a light clay with a gravel subsoil with just enough slope to take away all surface water as they do not want wet feet.

A light sod plowed the previous fall, well disked, harrowed and crushed until in the best possible condition makes an excellent home for the plants. We now mark in rows 4x5 feet more or less, according to the richness of the soil. One man will dig the holes about 8 inches deep, another follows, carefully placing the plants in the holes, while a third man draws the loose dirt

around the plant. At the same time one man with a boy to help him is working at the hot beds, another boy leads the horse to and from the field. Two stoneboats are used. With this crew an acre of tomatoes can easily be set in a day. While plants started 3 weeks later transplanted only once, 2 or 3 inches apart can be handled much faster, also produce an equal amount of fruit, they will not be as early and it is the early fruit that brings the large prices.

Cultivating begins immediately after planting and should continue until a horse can no longer pass through the rows without injuring the plants. At first a heavy cultivator is used but as the plants grow and fill the ground with roots, only a light fine tooth cultivator is employed.

Now as to picking. By July 15, tomatoes should be ripe and at a good market will bring 8 to 10c per pound. The price will, of course, drop gradually, but the yield will increase thus bringing in good profit continually.

After the tomatoes are picked, they are all carefully wiped, sorted in 3 grades, packed in 12 pound baskets, turned stem down, hardest in the bottom, and ripest on top. Later in the season, as the yield increases they are packed in bushel crates for the home market and in flat half bushel baskets for shipping.

For shipping they are picked a trifle greener and covered with red net. We pick the patches on alternate days, until frost comes when we gather everything ripe and green, and place in a room that can be heated. In this way we can ripen most of them and continue to sell ripe tomatoes for almost a month longer.

Last year we picked from 1 acre, which contained 2,200 plants, 49,500 pounds or 720 bushels an average of 22½ pounds per plant. This amount of fruit brought $421.60 or almost 1c per pound for the entire crop. At one time we counted on a single plant over 200 perfect tomatoes. The first ripe fruit was picked July 13, and sold at Oshkosh for 10c per pound by the basket gross weight.

In this way, you see, we get back money expended for baskets. It is also a much handier and neater way of selling and your fruit is not culled over by the purchaser.

For the home garden I prefer the single stem culture which is done by driving a stake 2 inches square and 5 feet long by each plant. To this the plant is tied and all side shoots pinched

off allowing only the center leading stem to grow. In this way plants may be set 18x30 inches. Twelve plants well cared for in this way will supply a family with plenty of fruit for the table, also an abundance for pickling, canning and preserving and a liberal quantity to give to friends.

A Member: There is one question that bothers me a great deal; in the paper the tomato was called a fruit. I have heard it called a fruit and I have heard it called a vegetable.

Mr. Rasmussen: From everything that I could find in looking up the plant in all the books I could secure, I can bring you all the evidence you want that it is a fruit, also that it is a vegetable.

Mr. Irving Smith: I have been in several discussions on that very question and it is a very interesting discussion too. We have come to the conclusion that it is a fruit used as a vegetable, that is the only decision we can come to.

The Secretary: We have a botanist here, Prof. Cheney, no doubt he can enlighten us on that subject.

Prof. Cheney: Briefly, I should say it is simply a matter of usage. A fruit, botanically, is the ripened seed case of a plant, and in that sense a tomato is a fruit, but without question it is used as a vegetable. I should say it is a matter of usage. The term vegetable, in a broad sense, includes everything that grows out of the ground, but that it is not the way you would use it, of course, in gardening, the term is used as applying to carrots and potatoes and that sort of thing generally, and there it applies as well to the tomato.

A Member: I would like to ask the tomato grower whether he has tried putting his plants down, to lay them down instead of setting them upright.

Mr. Rasmussen: I have on occasions, but the roots formed along the stem, formed to grow a new plant before I had any material to grow fruit from.

A Member: So you would not recommend that?

Mr. Rasmussen: I would not recommend that kind of planting, it is growing too fast.

CONTRACTS.

C. L. RICHARDSON.

A contract as commonly accepted, is an agreement between two or more parties to do or to refrain from doing a certain thing. In order that it may be made, certain things—the elements of a contract—must exist. There must be the two parties to the agreement to do mutual things or exchange mutual promises; a thing or things to be contracted for; a consideration to support the contract; and the assent of the contracting parties.

It is a common expression in the law of contract that the minds of the parties must meet—meaning that they must have in mind and agree to the elements and all important particulars of the transaction, including the identity of the other party and of the thing contracted for, the consideration and its manner of payment, and the terms of the contract. Matters which are thus essential are said to be "of the essence of the contract," and are largely determined by the parties themselves—among the most common being the place of payment, and the effect of delay on the contract, in causing the delayer to pay damages, or by allowing the other party to abrogate the contract entirely.

The assent of the parties is another vital element, as it is the outward, visible sign that the minds of the parties have met on the terms. Assent is usually expressed by words or letters in answer to a spoken or written proposition, but any other means of communication will answer as well. Thus telegrams, telephone conversations, acts, gestures, and in rare cases, absolute silence under an obligation to speak, may signify assent and so bind the parties to perform the contract.

The essential acts in the formation of a contract are (1) An offer by one party, and (2) An acceptance by the other. Compliance with the offer must be with knowledge of it. Accidental compliance does not make a contract; the minds of the parties never met. Acceptance must be in precise compliance with the terms of the offer. In a leading Wisconsin case an offer to sell land, payment to be made in Connecticut, was accepted with the reservation that payment should be made in Wisconsin, and it was held not to be an acceptance in terms so as to bind the contract. In other words any material alteration in the terms of ac-

ceptance is treated as a counter-offer and breaks the original offer as would a refusal, so that it cannot afterwards be accepted unless renewed. An offer takes effect from the time it is presented to the mind of the offeree, and is considered as continuing until it is either accepted, revoked, rejected or expires by lapse of time. An offer must be accepted within a reasonable time, although what constitutes a reasonable time is not fixed by any rule of law but depends on the circumstances of each particular case. Nine or ten days' delay has been held unreasonable. Four days has been held too long a delay. The strict cases have allowed the offeree the day of the receipt of the offer to consider, and have held that an answer by the first mail of the following day was binding. In the absence of instructions to the contrary, the acceptance is presumed to be made in the same manner as the offer, but the parties can stipulate for a different manner of acceptance, as by telegram, shipment of goods or otherwise.

The acceptance differs from the offer in some marked respects. Thus while the offer is not effective until it reaches the offeree, the acceptance is valid and binds the contract from the moment it is made, although not known to the offeror until later. The acceptance of a contract by mail is binding as soon as the letter, properly addressed and stamped is placed in the mail, although knowledge thereof may not reach the offeror for some time, or even although the letter never reaches its destination. A letter is "in the mail" when deposited in the post office or in a letter box. Whether an R. F. D. box is included is not yet adjudicated, but as the letter is not beyond control of the sender there would seem good reason to believe that a letter deposited in a rural letter box is not "in the mail." While acceptance is effective as soon as mailed, the revocation of an offer is not effective until it reaches the party intended. Thus A in Boston may make an offer to B in San Francisco. The offer may be sent on Monday, and received on Thursday. On Tuesday A may revoke the offer, but the letter will not reach B till Friday. So if B accept the offer Thursday or any time before the revocation reaches him the contract will be formed, though A's revocation has been three days on the road.

A contract requires a consideration to support it. By this is meant that gain or benefit to one party or that loss or detriment to the other which is the moving cause of the transaction. It may be money, a promise, or the doing or forbearing to do a certain

thing. A promise, or forbearance, or performance on one side may be the consideration for any of these on the other side. The contract to be binding must be mutual—in order that one party may be bound both must be bound.

Care should always be taken not to construe as an agreement letters which the parties intended only as preliminary neogtiations. Thus in a leading Wisconsin case the defendants offered, through a circular letter, salt at a low price in carload lots, whereupon plaintiffs telegraphed an acceptance for 2,000 barrels, and when delivery was refused, began action. The court was of the opinion that the letter offering salt was a circular, a mere preliminary advertisement intended to attract patronage, and that the telegram was not the acceptance of an offer to sell but an offer to buy, which must be accepted by the other party before a binding contract came into existence.

This case has a direct application to every nurseryman and fruitman in the state, as it establishes the rule that a circular, price list, or catalog is not an offer to sell but a preliminary advertisement intended to attract trade. Hence it follows that an order for nursery stock from a prospective customer for certain amounts, varieties, etc., is an offer to buy these goods only, and whether considered as an offer or a counter-offer abrogates all terms of the trade circular with which it may conflict. When taken in connection with the letter of acknowledgment, and retention of the purchase money it amounts to a contract of purchase and sale, subject it would seem to the implied condition subsequent that the nurseryman has the stock on hand when the time for delivery arrives. It then becomes the duty of the nurseryman to fill the order exactly as ordered. If the order reads "do not substitute" or "in case you are out of..... (a certain variety) you may substitute ..... (a certain other variety) only," it must be filled as ordered. In the absence of provisions to the contrary it would seem to be in the minds of the parties that the order should be filled as far as possible, and substitution allowed. If substitution were attempted in a "do not substitute order" the purchaser might at his option refuse the stock and demand back the purchase price and transportation charges.

It will avoid difficulty if the purchaser will give the date of shipment as this is often a material element, "of the essence of the contract." While it is reasonably clear that undue delay in ship-

ment is cause for avoiding the contract, there is no precise definition in law as to what constitutes undue and unreasonable delay. Three weeks has been held an unreasonable delay in shipping a carload of beans. Probably ten days or two weeks would be an unreasonable delay in forwarding nursery stock, depending on the stock, the time of year, the injury caused and the surrounding circumstances. In the absence of express terms making shipment by a certain day necessary, the purchaser would probably be deemed to waive the delay unless he notified the vendor that on failure of the stock to arrive he elected to rescind the contract, and demanding return of the purchase price. It will avoid misunderstanding, where time is essential if the order contains a direction that the stock shall be shipped by a certain day or else the money is to be returned to the purchaser. It would seem that such contracts for future delivery are made, if not otherwise specified upon the implied condition that the vendor shall actually have the stock when time for delivery arrives, and he is freed in case of destruction of his stock or in case he is previously sold out.

Often when the stock arrives it is found to be deficient in size, amount, quality, etc., failing to fulfill the representations or warranty under which it was sold. Under such conditions the purchaser has the right to inspect and examine the stock before accepting it. This right is not waived by payment of the express or freight charges, or even the entire price of the stock if this is necessary before the carrier will give possession thereof. If upon such examination, the stock fails to meet the express warranty (size, condition, quality and any other standard it was guaranteed to attain) under which it was sold, or the implied warranty that it is suitable to the purpose for which it was sold, the purchaser may within a reasonable time notify the vendor of these facts and refuse to take it, demanding repayment of the purchase price and freight. Or he may separate the good from the worthless stock and make payment for the good portion only, or in case none of the stock be worthless but merely defective or below grade, he may notify the vendor of such condition and refuse to pay full value therefor. In that case he is only liable for the fair market value, and if sued for the full purchase price he may set up a claim for damages to the amount of the difference between the market value of the property which was received and the market value of that contracted for, besides special damages

arising from the failure to perform, where such special injury was known or contemplated by the parties.

REPORT OF DELEGATE TO THE AMERICAN POMOLOGICAL SOCIETY.

J. G. MILWARD.

Through the courtesy of the State Horticultural Society, the writer was privileged to represent Wisconsin as delegate to the American Pomological Society meeting held at St. Catherine's, Ont., Canada, Sept. 14 to 17, 1909. The past convention was the first time that the Society met outside the boundaries of the United States.

The meetings of the Pomological Society have always been of national importance because of the opportunities to come in touch with the widely separate horticultural interests of the country. Your delegate, while in attendance at the meeting, had in mind two questions which have always been discussed at our Wisconsin conventions, (1) "What estimate should be placed on the commercial Wisconsin apples as compared with the apples of other commercial apple-growing centers," and (2) "Is Wisconsin horticulture progressive?"

(1) In connection with the American Pomological meeting a joint fruit exhibit was held with the local society at St. Catherine's. Your delegate entered an exhibit of apples to be passed upon for merit and for the Wilder medal. The exhibit included the apples of Wisconsin origin—Northwestern Greening, McMahon, Windsor Chief, Pewaukee, Wold River, Plum Cider, Milwaukee, Gem City and Newell. Professor Taylor of the Department at Washington passed upon the exhibit and awarded the Wisconsin State Horticultural Society the Wilder silver medal. Much favorable comment was passed by experts upon the apples exhibited, and the apples shown compared very favorable with any shown in the hall.

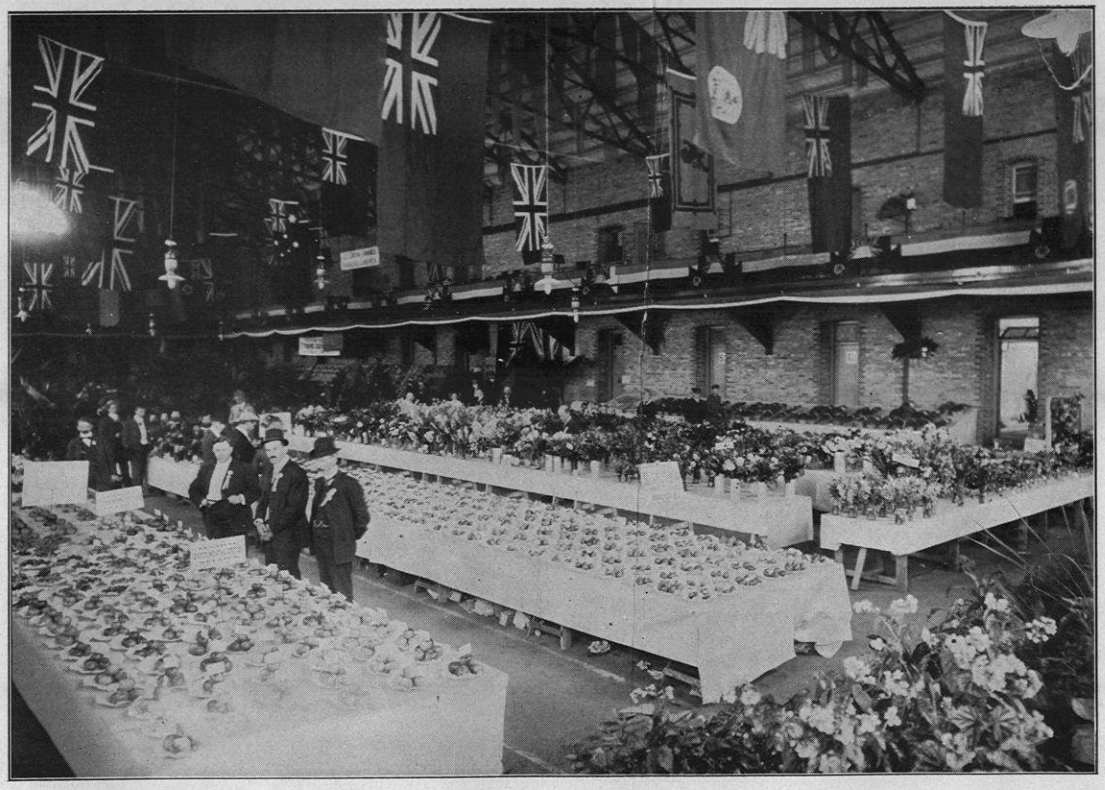
As a recommendation for future exhibits of this kind, your delegate would recommend that the exhibit be put up in commercial packed boxes, and that the display be made not only to include apples of Wisconsin origin, but also other varieties such

as the Wealthy, McIntosh Red, which are also grown commercially in Wisconsin.

(2) *Is Wisconsin horticulture progressive?* It gave your delegate much satisfaction to know that Wisconsin is keeping abreast of the times in adopting gradually the more progressive cultural methods. The source of satisfaction should not be taken as resting too strongly upon what has been accomplished in the past as upon the possibilities for future progress. It is encouraging to us that new developing horticultural fields are in a position to take up the more progressive methods and to profit by the mistakes of others, than some of the old districts where horticultural interests appear to be abating. Wisconsin horticulture should rise to the possibilities in the adoption of such methods as is making modern commercial fruit growing profitable. That is, including (1) improved methods of picking and marketing fruit, (2) intensive commercial spraying, (3) selection of commercial varieties, (4) adoption of intensive cultural methods.

In regard to the program at the convention, it might be well to say that the time was allotted to a discussion of a wide range of fruits, and hence not much time was spent upon fruits adapted to Wisconsin conditions. Probably two of the best subjects on the program were those of the sulphur sprays discussed by several experts, and the fruit marketing session which was handled very ably. Much of the time was spent in the considering of subjects of a somewhat technical nature such as the naming and classification of fruits.

Mr. D. E. Bingham of Sturgeon Bay was in attendance as a delegate also, and will report upon orchard conditions as he found them in the commercial orchards in the vicinity of St. Catherine's. Your delegate was treated very courteously by members of the local society at St. Catherine's, and also by officers of the American Pomological Society.



Portion of exhibit biennial meeting of American Pomological Society, St. Catherines, Ontario, 1909.

STUDENT JUDGING AND IDENTIFICATION CONTEST.

PROF. J. G. MOORE, Horticultural Dept., Univ. of Wis.

A new feature at the winter meeting of the Horticultural Society was the Student Judging and Identification Contest. For some little time there has been given in the Department of Horticulture, College of Agriculture, a course in pomology, which has as one of its objects the familiarizing of students with the common varieties of fruits grown in Wisconsin and other states. This work has been primarily confined to the apple.

For some little time there has been carried on in connection with the winter meeting of the Michigan State Horticultural Society, a Student Judging Contest. This contest seemed to create a great deal of interest in the lines of variety identification and judging, not only among the students in the College of Agriculture, but also among the fruit growers in attendance at the winter meeting. The writer suggested to the President and Secretary of the Society that the inauguration of a similar contest in Wisconsin might be expected to have similar results, and also increase the interest of the students in the Horticultural Society to which, in the past, comparatively few have had any definite relation.

The suggestion met with the hearty approval of the Executive Committee, and a sum of $20.00 was set aside as prizes for such a contest. It was divided in four prizes of $8.00, $6.00, $4.00 and $2.00 each. The contest consisted of the identification of fifty specimens of apples taken from among some thirty or forty varieties suitable for use in Wisconsin, and commercial apple culture in other state. The second part of the contest consisted of the judging of four variety classes of six entries each; the student being required to award four prizes and give the reason for the awards. The work required over three hours, and the results obtained were highly satisfactory. The final awards were made by Mr. D. E. Bingham who was selected by the President as judge of the contest. The final grade of the student was determined by taking the sum of the final ranks in both the identification and judging contest, in which the student had been placed first, second, third, etc. The student having the lowest grand total was declared winner. The prizes were awarded as follows: Miss

Vida French, first; Mr. Carl Muck, second; Mr. M. W. Richards, third, and Mr. W. Mueller and Mr. P. Lunde tied for fourth.

While this contest was only an experimient during the present year, the interest which it awakened among the students, members of the State Horticultural Society, and parties who read of the contest through the press, was so great that it would seem advisable that the contest be continued, and that the scope of the work covered be still further perfected in the future. One noticeable feature was the fact that those students who took part in the judging contest were more interested in the regular program than the average student who was not in the contest, being more regular in attendance, in fact, being present whenever the work at the University would permit.

The Horticultural Department feels very grateful to the Executive Committee of the Society for making possible this contest, and for its co-operation in trying to train the young people of Wisconsin along practical fruit growing lines.

WASHINGTON AND OREGON VS. WISCONSIN.

The President: We will now follow the suggestion of our Secretary and call on Mr. F. J. Toland of L Crosse to speak to us on the Western country.

Mr. Toland: I was invited to talk to you about Washington and Oregon and possibly can tell you some things that will be of interest. For a good many years I have been interested in fruit growing and the height of my ambition has been to own a good commercial orchard. With that object in view I have visited fruit growing sections in New Jersey, Virginia, Illinois, Michigan, Missouri, California, Oregon and Washington. I visited Spokane, Wash., the 2nd day of May, 1909, and left it on my return trip the 14th day of July. During that interval I visited nearly every advertised fruit proposition in Washington and northern Oregon. Quite a number I had visited in previous years and this was my fifth trip to the Pacific Coast. As I found conditions materially the same at all the advertised points, I will only mention some of those which are most prominently before the public, and as briefly as possible.

At Spokane I found numerous propositions that from a speculative standpoint were good, but I did not find anything in existence nor prospective that inclined me to believe that apples could be grown successfully or profitably in the vicinity of Spokane, Wash. The soil is varied, including pure unadulterated sand, coarse gravel with a sandy loam, I should say from 25 to 40 per cent gravel with a very liberal top-dressing of what we boys used to call clay, clay loam, and in some of the valleys, muck. I decided that the land would be good, some of it, for truck gardening and small fruits, but it would require considerable fertilizer and in loose soil the fertilizer would undoubtedly leach through and give no permanent benefits. As to the climate, the regular climate is subject to very severe and sudden changes, and the local conditions are such that on almost every quarter section that I came to I found land that was liable to frost, late and early, and land that would be caught by frost any old time during the growing season. The irrigation schemes that I saw consisted of wells with comparatively cheap pumping plants which were supposed to become the property of Eastern people when they purchased all the tract. I figured that they would prove very expensive, very uncertain, and it seemed that the water was too cold to secure the best results from irrigation. The commercial orchards exist more in the minds of the advertising companies than in reality. I saw a few orchards that the owners called commercial orchards. They were on the prairies and were not irrigated. Not one of those men that I met told me that he had ever made any large amount of money from raising apples at Spokane.

From Spokane I went to Pasco. If you are interested in Western land, keep your eye on Pasco, but be sure to keep your eye open on the real estate man at Pasco. There is nothing at Pasco very interesting to the fruit man. There is one farm about two miles from Pasco that is irrigated from the Columbia river, and I understand has been very profitable. I did not have any trouble to find a place to put money; they are looking for it, they meet you at the train and they follow you to the train when you are leaving if they have not got your money,—in that case it is different. It may be a good thing, I think it will be after a while when they get water, but to secure water for irrigation or for the city even, they will have to raise it more

than 200 feet, and it seems to me that will be a pretty expensive proposition.

I suppose you have all heard of Atalia, as they call it out there. You have read those Arabian Nights stories, and sat up nights looking at the lovely pictures that are issued by the Atalia Land company. Long before I got to Atalia I saw pillars of what appeared to be smoke and I took it as a token that I was approaching the promised land, that in a short time I would be looking at the milk and honey trees. I was assured that a one-legged, one-armed, one-eyed man could make more money from five acres than an able-bodied farmer could in poverty-stricken Wisconsin on 160. I was disappointed in Atalia. I will say for the credit of the city that I never saw finer sage brush, and I have seen sage brush in nearly every state in which it grows. Most of it was fully five feet above the volcanic ash, it would all have been above had it not been for the gentle zephyrs that drifted the volcanic ash up against a portion of it until it struck through like asparagus points. The biggest trees I saw in Atalia were North Carolina poplars, about three inches in diameter. I was not the only disappointed pilgrim; two gentlemen from Ohio and one from Pennsylvania that had been taking absent treatment from the gentlemen that produced the literature that advertises Atalia, decided to go and not to buy. By the way, I discovered that those pillars of smoke that had raised my hopes were volcanic ash disturbed by the graders in leveling down the asparagus beds. I guess there is water there, but they did not have things in running order, which I am sorry to say was a big mistake. In numerous places where they are selling land they claim a man can make more money from five acres than a quarter section in the Northwest, and ten acres assures a man an independent fortune.

Leaving Atalia we soon reached a higher altitude, some very large fields; wheat farms, where they own or lease from 500 to 1,000 acres; each season one half of that is seeded, the other remains fallow. Between Pasco and Walla Walla I saw no crops outside of wheatfields. At Walla Walla I found conditions a little different, the people were not so given to the Munchausen style prevalent in the West and I found some really truthful men. The business men told me that they had a good, growing city, that they had good commercial orchards, two of them, one was located at Salem, the other up at Dayton, quite a little

distance from there. They stated many of the people were making money from small fruits and vegetables, not $1,000 an acre, but netting from $75 to $100 an acre. They claimed that some of the land was very fertile, some was not; that a stranger should be very careful before purchasing. They thought they had nice weather, but they admitted that the summers were very, very hot, very, very dry, very, very, very dusty and quite windy and they did not lie. After two days I found that I could not find what I wanted in Walla Walla without assistance, so I called in a nice gentleman, real estate man; this gentleman informed me confidentially that he owned or had option upon everything that was worth looking at around Walla Walla. He took me out and showed me numerous farms he had sold a few months before to Eastern people at $50 to $60 an acre, which those same Eastern people have since refused from $150 to $200 an acre for. I might have believed him, but he quoted prices to me on some of the lands that I looked at that were 25 to 30 per cent more than the owners had asked. So at noon we went to town, I was captured by another real estate man, who also confidentially advised me that he alone owned and had options for all the territory adjacent to Walla Walla, and that he had a little the best bargain in the state of Washington. He showed me a 30-acre proposition, ten acres of orchard, the orchard was scrubby, he said it was in its prime, eight years old, I afterwards learned it was thirteen years old and never had borne a crop of apples. The rest of the land was in rye and oats, the hay of the Western country. After inspecting it I said, "Now, look here, Mr. Blank, I am a stranger, I don't know much about land and conditions out here, now, honestly, between man and man, is that a fair sample of the land in this vicinity? Would you consider, if I was a poor man that that was going to be a good investment for me?" "Friend," said he, "there is not any better land on earth than that, why, that little farm will make you rich." Well, I believe every man to be truthful until I find out he is lying. I said, "What about this yellow stuff in that field?" "Oh, we had heavy rains and the sun came out hot, and the stuff was brown and scalded out." Every foot of it was underlaid with hardpan anywhere from six inches to I don't know how far down, I should judge not very far, the same as they have on the sandy hills of San Diego, they have to blast it out when they put in shade trees. I found tent caterpillars and

signs of scale in that orchard. I got back to Walla Walla and I looked around through the grocery stores at the apples. Of course you will understand this was in May, I did not expect very good apples. I bought five of them, one of them had scab and two of them were wormy,—but please understand, there are no insects that will injure fruit in Washington or Oregon.

From Walla Walla I went to North Yakima. At North Yakima I met several of my former students who were there and two of whom owned fruit farms. I visited them and asked their advice as to buying at the price at which the stuff was quoted to me and the stuff that was shown me and they said, "Don't." Yakima is a very pretty little city, the business part of it lies down in the flats on the Yakima river, sewerage is bad and they are subject to typhoid, which is not a very pleasant disease. The government scheme above Yakima is not more than just in the starting you might say. The water of the Yakima river, which is used for irrigation purposes, is, at the present time, or when I was there, no more than sufficient to furnish water for the people who already had rights. At Sunnyside and points below Yakima they were complaining of scarcity of water, and not only that but of the sewerage from Yakima which is polluting the river. I saw some very beautiful apples at Yakima, as pretty apples as I ever saw in my life, no prettier, though, than I had seen in Wisconsin, the only ones that approximated the apples in Wisconsin and Minnesota were the Spitzenbergs and Jonathans. One gentleman showed me a very nice dark apple, and told me "There is an apple that has not been in cold storage, ordinary cellar, what do you think of it?" I took my knife, peeled it. "What do you think of it, what do you think of that for a keeper?" I said, "I will admit it is a keeper, but let me ask, why do you keep it?" The climate of Yakima ranged from 124 in the shade to 22 in the shade, freezing one-and two-year old peaches and four-year old peaches which ranged three or four feet high. Do not understand they were all that way. They are keeping out frost by smudge pots. I found nothing but vegetable or truck gardens and small fruits and some cherries around South Yakima. South Yakima is one of the big schemes which is being advertised as a fruit proposition. It was originally a part of the Pacific Coast. There is more fertility in two pounds of the sand around Sparta than in ten acres of that stuff. You cannot sprout sandburs in it, but

they are selling it to professional people in the East. Between that land and Vancouver there is some pretty good land, I think, but it is certainly wooded, although it was logged off years ago and it will cost $40 to $50 an acre to clear it. You can buy it at wholesale from $6 to $12 an acre. There are large prune and cherry orchards, but people do not value them very highly, they are not profitable. I did not stop at Portland for the purpose of seeing the orchards that they have. Next I locked up the walnut proposition. I went over into Dam Creek country; I found numerous orchards which appeared to be one or two or three years old, the one-year old had been injured by frost. I found no old trees. Farmers told me that they put those things down to sell the land.

Hood River is the most widely known proposition of the Western country. They have got the orchards, they have grown the apples and they have the brainiest lot of men engaged in business. The schemes there, however, are all real estate speculative propositions. So far as I was able to learn, I would advise any one to beware of them, and while the orchards are beautiful and profitable, a poor man could not buy more than an acre or two and the other propositions were unsafe. I visited everything that is within twenty five miles of Salem. My entire trip was something over 3,000 in an automobile through those countries. Salem is a beautiful valley, that is the valley of the Yakima river, reminds me very much of the countries east of the Blue Ridge mountains of Virginia, especially Albermarle country. There is one good orchard there, they claim that orchard made the reputation of Hood River. It has its reputation on account of prunes and cherries. The lands in that country varied in color from dark chocolate clay to very light clay and some sand and some muck. The old orchards all showed disease. In regard to the wondrous stories about large amounts to the acre, why, they do not get them. They make $75 to $100, that is what they told me down there. They raise corn, but they have to dry it in the prune dryers, because it is so wet in the fall. Of hay and timothy they can get one crop. There is one thing I would advise any one going out to remember, look out for the real estate men; do not believe the advertisement stuff that is put out by real estate people. They use the same pictures interchangeably, everybody is advertising Hood River, Wenatchee, North Yakima, by the same pictures, not one but a great many.

The climate east of the Cascade range is insufferable in summer, west of it in both Washington and Oregon is too rainy to suit me, very disagreeable in that respect. In conclusion I should say this, that there are opportunities there for a man who has money, so there are in Wisconsin. I found that the principal things according to my view were, first, intelligence in the selecting of a location and fruit; second, intelligence in taking care of it; third, intelligence in organizing. The others depend on the location and shipping facilities, and it was my honest opinion from my limited knowledge of the subject that any man that would use the same amount of brains, cultivate his land as carefully, select his land as carefully and select as good kinds of fruits he can make just as much money in Wisconsin from a limited capital as he can in Washington or Oregon.

W. H. Hanchett: You have already heard a speaker who had taken more time to investigate the matter from a business standpoint than I have. The impressions I got were right in line with the facts that he gave you from his investigations. It was my privilege to put in one day in the Hood River valley, driving out among the orchards. I also had the opportunity of calling on the Apple Growers' Union and consulting with one of the office force at Hood River and also interviewing a real estate man. In consulting with one of the office force of the Apple Growers' Union I asked him what the estimated apple crop was in the Hood River valley this year, and he told me it was an off year, that the crop was a minimum crop, that it probably would be about 100 carloads out of Hood River valley this year. In interviewing the real estate man, or in having the real estate man interview me, I asked the amount of available orchard land in the valley. He said it was about 50,000 acres. I asked him what per cent was planted and he told me about 30,000 acres were planted. I asked him what per cent of that already planted was bearing and he told me that about 25 per cent was of the bearing age. In making a few figures I estimated that that would reduce the bearing age to about 7,000 or 8,000 acres, and in estimating the yield of the Apple Growers' Union that year to be about 100 carloads, it would reduce the average yield to about seven or eight bushels per acre. I think we might put this up for Wisconsin orchards as a minimum crop. A Wisconsin orchardist probably would not be able to conceive of such favorable circumstances as would reduce his yield from an

orchard, even though it was the off year, to seven or eight bushels an acre.

In driving out through the valley we drove miles without seeing an orchard with an apple in it. We were told that the harvest season was just commencing and that the apples were mostly off the trees. We found a few orchards where there was something of a crop of apples, one small orchard in particular I noticed was heavily loaded, every tree was propped, every branch of every tree was propped, and if they were getting the prices which they claimed they were getting, it would not be hard to figure up two or three thousand dollars per acre for the crop. We were given the impression that a large share of the crop had already been contracted for at $3.35 per bushel box, and of course we could believe some of the stories the real estate men told us, if that were true. We were told that one man had been offered $4,000 for a crop on one acre and a third, and another man with a 15-acre orchard had been offered $2,500 per acre for his crop. There was one thing which was the cause of considerable surprise on my part in going through the valley and that was to notice the farm homes in this orchard district where we were to believe that dollars grew on the apple trees and all you had to do was to shake the trees and fill your pockets. The farm homes would not begin to compare with residences in Northern Wisconsin. We saw many farm homes that looked like a North Dakota field grain bin, with the door cut in one side and the window in another and a piece of canvas stretched over for a roof, and we were told people lived in them for several years. Of course the real estate agent would explain that that was because the climate was so mild. I have a few quotations from some of the trade journals in regard to what the Western apples really did bring on the market, and I find that there is quite a discrepancy between the quotations in the market journals and the prices quoted us in the Hood River valley. The Fruit Trade Journal of New York, January 1, 1910, says, "The box apple situation remains unchanged; prices were firm, but the movement was very slow. Spitzenbergs had the call at prices ranging from $3 to $4.50 per box." Now, we were given to understand that the crop of Spitzenbergs in the Hood River valley had been sold at $3.35 a box there. Here we have a quotation in the New York market at from $3 to $4.50, and Rome Beauty sold at $2.20, Winesap at $2.50 to $3.00, Newton pippins

brought from 2.50 to $3.00, while Ganos went at $2.00 to $2.50 per box. Now, when we take a freight charge of at least a dollar a box to get to the New York market, you will see the average price per box would probably not exceed the price which Mr. Marsh got for the apples from the Wausau orchard, from those quotations. A Chicago trade journal, Dec. 25, 1909, says, of the Chicago market: "Western box fruit is bringing $1 to $4 according to pack and quality, only the very best however sell around the top price mentioned, $4.00." The price refers to Spitzenberg, which are practically all out of the market, from one to four dollars. Now, when we strawberry growers get a quotation saying that strawberries are selling from 50 to $1.50, we expect the returns will show that a large part of them sold for 50 cents. I do not know but that might apply to Western box fruit, and if the majority of that stuff sold from $1.00 to $2.00 per bushel box, you can readily see with the large expense charged against it, that the grower got almost nothing for the fruit. The "Fruitman's Guide", January, 1910, says of the New York market, "There are a good many apples still to come forward from up state points and the stock is still held in the West largely in boxes, a great deal of this box stock will be coming forward right along. Some of the colorado apples in the market this week sold at auction at rather extraordinary figures, due, we believe, largely to the fact that oranges are so plentiful and more suitable to the holiday season. Gano sold at $1.05 to $1.45; some of the Ben Davis stock sold at $1.35 per box and Red Sweet at $1.00 per box. This fruit seems to be less active than was the case some weeks ago, though the condition of the stock was fair. There was a car of Washington apples sold here at auction on Monday and Spitzenberg sold at $1.25 to $2.25 per box." Take that sale at $1.25 to $2.25, it does not mean anywhere nearly the price that the Wausau apples were sold for. "These prices we believe show no special profit to the shipper and it is unlikely that the stock will be urged on this somewhat unwilling market." Now, you doubtless all have heard of the celebrated Dumas orchard that the real estate agents are always quoting. Now, the Fruit Trade Journal of Dec. 11, 1909, says, "In New York two cars of Newton pippins from J. L. Dumas sold for the lowest figures, $1.20 per box." It adds that Western Winesaps brought from $1.50 to $2.30, $2.60 and $3.00. Now, take the $1.00 charge from these and compare it with our

own Wisconsin apples at from $3.00 to $4.00 per barrel and then judge as to whether you want to go out there and pay from $400 per acre for wild swamp land without any improvement to $2,000 per acre for young orchards, and I do not think you will have any trouble in deciding where you wish to invest if you want to buy orchard lands.

I expected, when I started on the trip West, that I would become so enamored of the wonderful prospects out in that country that of course I would come back to Wisconsin, sell out just as quickly as I could and buy land out there, but when I got back to Wisconsin, Wisconsin never looked so good to me before. There was one thing that I noticed particularly going through that country, I went through some of the country where farmers planted orchards the same as farmers plant them in Wisconsin and then let them take care of themselves. Those orchards were certainly the worst looking specimens of orchards that you can find anywhere in any civilized country. The trees were moss-covered, the apples were moss-covered, and I do not think anybody would ever get so apple hungry as to be tempted to eat them. Certainly a neglected Wisconsin orchard would never get into so bad a condition as a neglected orchard in Oregon or Washington. If care and culture would make so much difference in Wisconsin as it does in Oregon, we certainly ought to think that orchard prospects in Wisconsin were very bright.

QUESTIONS AND ANSWERS.

SMALL FRUITS.

Question No. 1. Has anyone a failure with Dunlap strawberries?

Mr. Bingham: In Door county they are planting largely of the Dunlap and Warfield, and while the Dunlap is a berry that we pick with the Warfield, and it is a fair berry as far as yield is concerned, it does not yield with the Warfield. I think the Dunlap, though it is a good berry to work in with the Warfield, it is not as good a yielder as a great many have claimed for it, not in our locality.

Mr. G. J. Kellogg: I agree with Mr. Bingham on that score.

Question No. 2. What is the one Black and one Red raspberry?

Mr. Bingham: The Older and Kansas are perhaps as good black raspberries as we have; the Older was perhaps a little better yielder, a little hardier than the other.

Mr. M. S. Kellogg: It depends a great deal on the locality, or local conditions, as to which is the better. In some localities you cannot grow anything but the Older, in certain sections you can grow certain varities. The Commonwealth does better with us than the Older, it gives us more bushels and more dollars on the same amount of land.

Question No. 3. Which is preferable, deep or shallow plowing for strawberries?

A Member: I should like to answer that by asking, "Which is the right road to heaven?"

Mr. Knight: I can tell you—by the way of Bayfield Peninsula.

The President: That being conclusively answered, we will take up the next one.

Question No. 4. Which is better, spring or fall plowing, for strawberries?

Mr. M. S. Kellogg: It depends altogether on your soil. Some soil is better plowed in the fall than in the spring.

The President: How shall we apply that?

Mr. M. S. Kellogg: Fall plowing for heavy soil.

Question No. 5. Can strawberries be cultivated too much?

Mr. G. J. Kellogg: No, unless you go too deep.

Mr. Richardson: You cancultivate too late.

Question No. 7. When and how do you prune blackberries?

Mr. Hanchett: That is a hard question to answer, as it calls into consideration different conditions and varieties. With the Eldorado blackberry all the pruning we do is to go through and pinch back the growing shoots when they are two feet high, so as to make them throw out laterals, they do not load so heavily and the fruit is largely on the tips of the laterals. If you go through an Eldorado patch and prune the tips to any extent, you have pruned off your crop. With Briton pruning is more necessary. In the spring immediately after they come from winter protection, cut off perhaps one-third of the laterals. The Briton has the fault of loading so heavily that it cannot mature its crop, and I think it is advisable to prune for that reason.

Question No. 9. Would like to know the best method for handling strawberry plants, shipping, digging, cleaning, tying and packing?

Mr. Moyle: In regard to shipping strawberry plants, I use bushel baskets; the boys go into the fields, dig them up and jam them into the basket, bring them to the shed; there I have girls—good, smart girls—to sort them, and by that means I do better than by sorting them or tying them in the field. My soil is very heavy, the dirt clings to the roots, we wash a great many of them at the tank before we ship them.

The President: What is the manner of packing them in the basket?

Mr. Moyle: Use market baskets, they are generally convenient, get a thousand into a basket, the most up-to-date method is using slatted crates.

The President: Some years ago I received some plants from Sparta packed in bushel baskets, the idea seemed to be to pack as many as possible into the basket. I think growers generally are getting a better idea of seeing that the roots are well packed together and kept from drying, while the tops have air. With proper packing the tops ought not to suffer by long shipment.

Mr. Moyle: I was forced to adopt this. At one time I was in charge of a nursery where we had sandy soil and the method was to dig the plants and tie them in the field, took a gang of fifteen to twenty of us in the field, working all the forenoon and by dinner time we took them into the house and those plants were not fit to go out of the packing shed when they were shipped, many

of them. That was the method carried on all the time, and I made up my mind when I went into business for myself I would have something better. I would like to ask Mr. Pearson how he digs his plants?

Mr. Pearson: Dig them with a five-tined fork, put them in gunnysacks and carry them to the packing house that way.

Mr. M. S. Kellogg: The question was asked about digging plants with a potato digger. We have been for a great many years trying to find some way to reduce the cost of digging plants, and I will say we used both systems that have been spoken of by Mr. Moyle, bring in the plants after sorting, and sorting them in the field, the weather determining which method we should use. If it is a dry day, the plants are brought under cover; if it is a cloudy day, we often bunch them in the field. We can make twice the speed in the field as in the shed. We have used a potato digger, but it is not a success. We have also attempted to use a tree digger. The best digger we can get hold of is a good, husky man, with a five-tined fork.

Question No. 10. What are the best varieties of strawberries for Jackson county, on clay soils, for home use?

Mr. Hanchett: Senator Dunlap, Warfield and Dunlap, if you want more than one.

Mr. G. J. Kellogg: Add Brandywine and Glen Mary.

Question No. 15. What currants are most profitable to grow in Wisconsin?

Mr. M. S. Kellogg: Our most productive varieties are the Pomona and Wilder, to the exclusion of all the others. Those two take the lead, they bring the top prices on the markets and bring the top returns in the boxes, too.

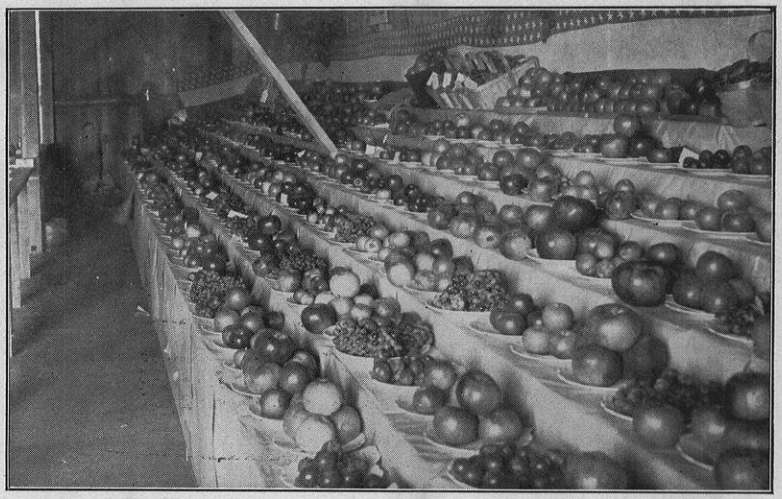
A Member: How about the Red Cross?

Mr. Kellogg: They are not in it with the Wilder.

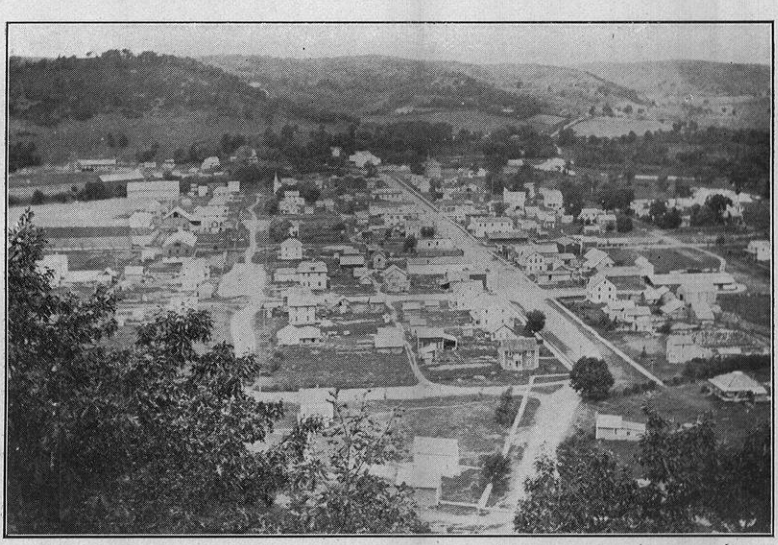
A Member: With us it keeps better than the Wilder, yields more and it looks better in the boxes. We have clay soil, heavy soil.

Question No. 17. Which would be the most productive and best market strawberries, two early, two medium and two late?

Mr. G. J. Kellogg: The two earliest that we have found the most satisfactory are Bederwood and Warfield. There are others that are about fifteen minutes earlier, but they do not bear anything. For medium, if you want a pistillate, there is nothing that exceeds the Splendid, and where there are so many varieties,



Portion of fruit exhibit at Sturgeon Bay Fair, 1909.



Birds-eye view of Gays Mills, Wis. This view was taken a short distance from our Trial Orchard which is ½ mile east of the village and 300 ft. up.

I cannot pick out two, I could answer that by taking a list and selecting, but for the best two late I would take Brandywine and Enhance.

Question No. 18. Would not the latest strawberries be more profitable than early ones for Wisconsin?

Mr. G. J. Kellogg: It depends on the market.

Mr. Richardson: If you get them too late, you run them into the beginning of some other crop and often on that account the late strawberry is not as good a paying proposition as it might be.

Mr. Pearson: In the list of late strawberries, I do not like to see the Sample left out; that is our most profitable berry.

Question No. 19. Has any member any record of how many strawberries have ever been produced on one acre?

Mr. Nourse: I gave the record of two acres and three acres and also the record of a sixth of an acre, $206.

Mr. Richardson: I would like to go on record that when you get 4,000 quarts to an acre, in strawberry culture, I think you have done about all that can be expected.

Question No. 20. How many quarts would a single strawberry plant produce planted alone under best conditions, having unlimited room to spread its runners?

Mr. G. J. Kellogg: Five quarts.

FLOWERS.

Q. I would like to ask what was the matter with some budding on rose bushes last season. The budding was done from the 1st to 15th of July; used shield buds of the present season's growth and inserted them in stocks 1 and 2 years old. I removed the wood from the bud and tied with raffia. I thought I was very careful but not one of them grew.

Ans. The next time you try budding be sure your stock is in a thrifty growing condition and the bark separates nicely from the wood. Be sure your buds are well developed and mature. Don't remove the wood from the bud but cut your buds so as to have as little wood on them as possible. Try budding in August and September.—W. J. Moyle.

Q. Name the six best varieties of gladioli for cut flower purposes.

Ans. (Red) Brenchleyensis, Independence; (Pink) America, Shakespeare; (White) Augusta, Marie Lemoine.—W. J. Moyle.

Q. What is the best method of transplanting evergreens (white pines)? Trees are about 10 feet high. They were set out a few years ago. I wish to remove them to another place.

Ans. It is doubtful if trees of this size can be transplanted with any degree of success as the white pine is somewhat difficult to make grow even with the smaller sizes. Dig the trees as soon as frost is out of the ground in the spring with as much roots as possible and set, packing the soil firmly about the roots, then keep well mulched and watered.—W. J. Moyle.

Q. Name a broad-leaved evergreen that is hardy in Wisconsin.

Ans. We know of none.—W. J. Moyle.

Q. Name three best trees for street planting.

Ans. No. 1. Norway Maple, Carolina Poplar, White Elm.—W. J. Moyle.

Ans. No. 2. Norway Maple, White Elm, Linden or Basswood.—F. C.

Q. Name the six best varieties of peonies for cut flower purposes.

Ans. Officinalis rubra fl. pl, Le'Esperance, Queen Victoria, Lenora Bramwell, Superba Purpurea, and Festiva Maxima.—W. J. Moyle.

Q. What is the cause of asters turning yellow before they bloom? If caused by insects, what is the best remedy?

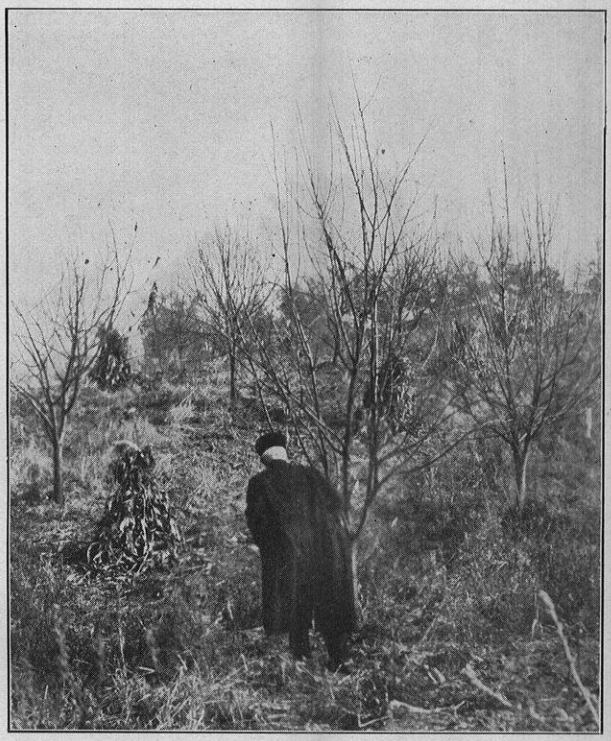
Ans. Asters turn yellow before they bloom because of a diseased condition, but no one has yet learned the cause or found a remedy.—Wm. Toole.

VEGETABLES.

Q. What is the best way to plant cucumbers, six feet apart both ways or in drills six feet apart one way, and how far apart should the plants be in the row?

Ans. With the large varieties I would plant cucumbers in hills four by five or four by six, allowing about four or five plants to grow in a hill. With very large varieties, four by six and occasionally six by six is all right.—J. G. Moore.

Q. Do you think we could gain in earliness by transplanting tomato plants from the hotbed into six inch flower pots, then plant them into a larger frame? Which would be the best to cover them, glass or sheeting?



Orchard J. S. Palmer, eight years planted. 1st and 2nd years, potatoes; 3rd, corn; 4th, oats; 5th, corn; 6th, oats and clover; oats cut green for hay; 7th, clover hay and seed; 8th, corn. Ground heavily manured 3 times in 8 years. Trees thrifty and profitable.

Marketing a portion of the 2100 bushels of apples in the Wausau orchard, 1909.

Ans. Earliness in fruiting can be obtained by planting the seed in a cold frame or better, in a hotbed, then transplanting into pots in the hotbed. The best covering for them is glass, although sheeting is less expensive. If very early tomatoes are wanted, the glass is probably better all around.—J. G. Moore.

Q. Last year for the first time I tried raising celery. It grew large but the stalks became pithy and hollow. The variety was Giant Pascal. I blanched by hilling with earth. What was the matter? Was it in the cultivation or in the variety?

Ans. Pithy celery is mostly due to poor seed, the wild and root celeries being pithy, unless care is used in the selection of seed the cultivated varieties soon degenerate. It is possible, though, for celery from good seed to become pithy if, after it is fully blanched, the plant is allowed to dry out, either in the field or in storage. The growth of the heart being at the expense of the moisture in the outer stalks.—H. C. Christensen.

Q. Name the best early tomato, the best extra large tomato, and the most productive tomato.

Ans. No. 1. Preferably the "Buckstaff," but seed is not yet catalogued this year. Second best "Chalk's Early Jewell."

Ans. No. 2. Henderson's Ponderosa.

Ans. No. 3. Late Stone.—N. A. Rasmussen.

Q. How shall I proceed to graft a tomato on a potato?

Ans. It is assumed that greenhouse facilities are available. The potatoes are started in 6-inch pots or in flats, and the grafting is done on good stout potato stalks four or five days after they have come out of the ground. It is well to select a cloudy day rather than a sunshiny day as the transpiration of moisture from the plant is not so great at that time. Select a fresh, vigorous terminal stem from a tomato plant, about three inches in length. The stem should be large enough so that a whip graft similar to the cut used in root grafting can be made. The cuts should be made as rapidly as possible, and the tomato stem grafted onto the potato stem about one inch above the ground, making sharp, straight cuts. Bind the cuts together with raffia, being careful to avoid against evaporation of the cut surfaces, by thoroughly covering with the binding material.

It is just as well that the potato should be a little dry just before grafting, and then watered thoroughly after the tomato cion is inserted. Use a stick in the flower pot to bind the plant to, so that there is no strain on the union. It is also advisable to allow

potato stems to sprout out from the region of the cut surface until after the tomato has become established. The grafting may be done in April, and after the union is established, the plant may be set out and grown under garden conditions during the summer, or the plant may be matured under greenhouse conditions.—J. G. Milward.

Q. Do you consider arsenate of lead a good solution for spraying vegetable plants?

Ans. Whenever it is possible to control an insect pest of vegetables by spraying with some arsenical compound, I believe arsenate of lead in general is best. It is not liable to damage the foliage as other arsenical compounds, and it sticks to the plants better. Better spray early in order to get the insects at the start rather than later when it will be less efficient, and more apt to damage the sale of the product because of the presence of the arsenical compound. With careful spraying, not enough of the arsenic could get on in any amount to harm the consumer.—J. G. Moore.

FRUITS.

Q. Why is cherry growing such a success in Door Co. Peninsula? Will cherries grow equally well in other parts of the state? Which is the best winter apple section of the state?

Ans. No. 1. The Door Co. Peninsula is located between large bodies of water. Has lime stone soil, late spring, frost proof, making ideal cherry country as well as for apples. Cherries will not do as well in any other portion of the state, at least it has never been proven that they will. Fourteen years here is what we base this statement on.

Door Co. produces varieties of apples that are practically winter varieties while the same varieties grown in any other portion of the state are only late fall and early winter. Door Co. and the Lake Shore produces winter apples remarkably well. Trees less liable to blight, lime stone soil making it perhaps the surest apple section of the state, all things considered.—D. E. Bingham.

Ans. No. 2. Cherry growing has become successful in Door county in part because of favorable conditions of soil and climate but largely because of the energy and good sense of those who have made it successful. It seems quite certain that there are other areas in the state where cherry growing could be made a success.

Cherry growing could be made fairly successful in Sauk county and other portions of the state away from the lakes if they were grown in sufficient quantity to leave a surplus after the birds have collected their tribute.—Wm. Toole.

Ans. No. 3. Slow coming of warm weather in the spring gives them immunity from late frosts. Nearness of large bodies of water is also another cause of immunity.—C. A. Hatch.

Q. Will cherries grow equally as well in other parts of the state?

Ans. Yes, on the "ridges" of Richland and Crawford Counties.

Q. Which is the best winter apple section of the state?

Ans. Do not know.—C. A. Hatch, Richland Center, Wis.

Q. Will cherry trees do well in the greater part of Wisconsin or will they do well only in Door Co.?

Ans. Not reliable in central part north of Oshkosh. O. K. elsewhere.—F. C.

Q. Is it necessary to plant apple seed in the fall so as to have it freeze in order to have it grow the following spring?

Ans. No.

Q. If so, won't it answer the same purpose to pour a little water over the seed, let it freeze and plant it early in the spring?

Ans. Yes. Apple seeds should be kept moist and cool. Pack in damp sand and bury outdoors or in cool cellar. Not absolutely necessary that they be frozen at all.—F. C.

Q. Can cherries be grown profitably in a rolling sandy loam, location, Langlade Co., Wis. Would birds be a serious enemy, frost, fungus?

Ans. No. 1. I would not think cherries could be made very profitable in Langlade Co.

Birds often are serious enemies where woods surround the orchard and cherries are grown in limited amount. Otherwise not serious.

Frost is serious consideration. Fungus is serious unless spraying is practiced, but is controlled by spray.—D. E. Bingham.

Ans. No. 2. I know of no reason why cherries would not succeed in such location.

I have never known birds to be a serious enemy where more than six or eight trees were planted, and that number will usually supply all of the birds in that neighborhood, and they do not

travel far. I should say that there ought to be no danger of killing frosts on rolling lands.

I should think that in a new country, such as Langlade County, there would be no danger of fungus diseases for at least twenty years.—W. S. Hager.

Q. Will apple trees do well on low land which can be drained so that no water will stand on it? The soil is sand and marl mixed with a number of sea shells mixed with it on top of which is muck?

Ans. Not advisable to plant apples on such land no matter how well drained.—F. C.

Q. About what is the average life of the Early Richmond and Montmorency cherry trees in Wisconsin?

Ans. Depends on care, 20 to 25 years. May live 50.—F. C.

Q. Are any or all of the following varieties of fruit raised in Wisconsin? Either on a big or a small scale? Peaches, Quinces, Apricots, Nectarines and would a person make a success of raising a few of each kind?

Ans. None of the fruits mentioned are hardy in Wisconsin nor should any of them ever be planted with the idea of growing the fruit for sale. It is often possible to raise peaches if sufficient time and money is expended in winter protection.—F. C.

Q. Is it a fact peaches will do as well in Wisconsin as anywherelse if protected a little during winter?

Ans. It is not a fact.—F. C.

Q. I have a few very strong growing winter varieties of apples. May I graft any kind of apples on this variety? Summer, fall and winter apples.

Ans. Certainly; cut out half of the tree and cleft graft. Then when the grafts are well established, say two years, cut out the balance of the tree and give the grafts full possession. It is not advisable to graft more than one variety to the tree as no two varieties grow alike and it is hard to get a balanced top.—W. J. Moyle.

Q. I have an orchard of about 20 years of age and it has not been cultivated for many years. Would you advise me to plow and cultivate it? I find it quite difficult to keep the above orchard pruned. The more I prune the bushier the trees get. I will be very thankful for any information on the subject.

Ans. Cultivate the orchard shallow and if soil is rich do not fertilize for a while, and if what you say about pruning is true,

better stop pruning, but I would advise annual pruning and removing of water sprouts during growing season.—D. E. Bingham.

Q. Is it better to graft apples in March than April?

Ans. No. The best time is just as the buds are bursting on the stock, but the scions should always be dormant. Scions can be cut and inserted the same day if they have not started. I have succeeded in grafting in warm days in February, if the wax works nice; if too cold, wax even from warm water does not do as well. If scions are kept dormant and on ice in sawdust they can be successful as late as June 10th; then I have had 90 per cent grow.—Geo. J. Kellogg.

Q. Can we successfully graft pears on apples and apples on pears?

Ans. No. The stocks do not unite well.

Pears on Quince to dwarf them.

Pears on Mt. Ash are practically successful.

Pears on wild thorn plum are a success, but do not take as well as on seedling pear stocks.

Plums will succeed on peach stocks and peaches on plum, but do best on seedlings of their own class.—Geo. J. Kellogg.

Q. I have not been successful in grafting. How shall I proceed in order to make a success of it?

Ans. It is assumed that root grafting is referred to, and the question presupposes a knowledge of the mechanical process of grafting. Order roots and cions late in the fall. Roots and cions should be stored in a cool, moist place, and not exposed to alternate freezing and drying. Leaves gathered in the fall are very desirable for storage purposes. Moist sand (not wet or sloppy) and moist sawdust is also desirable. Grafting may be done during the winter months, and the finished grafts stored as indicated above.

Make good, long, straight, sloping cuts. The unions should be about three-quarter inch in length. Use the piece root method and make root sections two and one-half to three inches long, and the cion sections about 5 inches long. Bind the cut surfaces tightly together, uniting the cambium of the stock and cion on one side. Grafting cloth is preferable for binding. The finished grafts should be carefully stored in a cool, moist place and kept dormant. Avoid sprouting. When spring opens, plant out in the nursery row, leaving but one bud exposed.—J. G. Milward.

Q. Will the Compass cherry stand the winters of northern Wisconsin and is it of any value as a fruit?

Ans. The Compass cherry is fully hardy anywhere in Wisconsin. The fruit is somewhat better than the choke-cherry in quality but not much. Tree larger and prolific. Where no other fruit can be grown the Compass is of some value, but not nearly as good as even the poorer varieties of native (red) plums.—F. C.

Q. Are the Salome and Windsor Chief adapted for a commercial and family orchard in southern Wisconsin?

Ans. Yes.—F. C.

Q. My pear trees blossomed and set fruit last year but soon they commenced to fall off until every one was gone. What was the cause of this and what can I do to prevent this happening again?

Ans. This was due to some atmospheric conditions such as frost, rain or dry weather. It may never happen again.—W. J. Moyle.

Q. What is the best blue plum that will stand the Wisconsin winters?

Ans. We have none fully hardy. Moore's Arctic and Lombard come nearest.—F. C.

Q. Could cherries be budded on our native stock (choke, black and red, all wild)? If so, which kind would be best? Would not trees budded on this stock be hardier in this climate?

Ans. None of the native cherries furnish a congenial stock for the cultivated cherries. It is wholly impractical and any attempts in this direction will be a waste of time.—F. C.

Q. I have a few plum trees. They always blossom and set fruit but it always falls off. What shall I do?

Ans. If the plums turn black and fall immediately after setting, the indications are that the brown plum rot is the cause of the trouble. Spray with Bordeaux mixture before blossoming and immediately after the fruit sets. This will lessen the damage. If the plums fall when they are about the size of marbles, it may be that they are infested with the curculio or gouger. In that case, attention should be given to control the insect by spraying and by the catching method.

Some plums show a lack of ability to mature their fruit, and this has sometimes been attributed to improper fertilization of the blossoms. In a mixed orchard where many varieties are planted, this trouble should not be prevalent.—J. G. Milward.

Q. Can apple trees be set twenty feet each way and never thinned, if they are properly pruned?

Ans. No. 1. In most portions of the state certain varieties will be more profitable twenty feet, such varieties as Wealthy, Yellow Transparent, Windsor, Chief, Longfield, Newell, Duchess, etc. Pruning will, if properly done, do a great deal to control distances. Northwestern Greening, McMahan, Snow, McIntosh, Dudley, etc., about twenty-four feet is better.—D. E. Bingham.

Ans. No. 2. No; not for any of the spreading varieties; 24x32 would be much better for orchard planting.—A. J. Philips.

Ans. No. 3. Yes, but they will need thorough pruning and heading back as they get large size. Keep the head compact, but keep the center open to let in the sun to color the fruit.—Geo. J. Kellogg.

Ans. No. 4. Given a sunny exposure I believe trees twenty feet each way can be grown and fruited successfully if pruned with open heads. Of course some varieties are more rank in growth than others, but Wisconsin does not grow as large trees as some other states.—Dr. T. E. Loope.

Q. What is the value of ferrous-arsenate as compared with arsenate of lead as an insecticide?

Ans. As a rule, use only standard, well tried insecticides. Ferrous-arsenate has not been tried sufficiently to compare its value definitely with arsenate of lead or Paris Green. Until the ferrous arsenate has been tried out and the results published, arsenate of lead or Paris Green should be preferable.—J. G. Milward.

Q. What is best spraying solution for pears?

Ans. Bordeaux mixture for scab and other fungous diseases: add arsenate of lead for codling moth and all eating insects. Pear blight, indicated by blackened foliage and twigs in summer cannot be controlled by spraying.—F. C.

Q. What sprayer can I get that will not clog and have plenty of force. I mean a hand sprayer?

Ans. Any sprayer will clog unless the spray mixtures are properly strained. Use high pressure, 100 to 110 lbs.—F. C.

Q. How am I to prune grape vines?

Ans. (a) For pruning the vine and roots at planting time see Fig. 1, opposite page —— of this volume.

Ans. (b) For pruning the vine the first autumn after spring planting see Fig. 2, opposite page —— of this volume. Should

the vine appear weak prune back to two strong buds the same as at planting time.

Ans. (c) If your vine has flourished the second year you would have in autumn two horizontal arms, each having two or more vertical shoots. See Fig. 4, page opposite ——.

Prune back to the horizontal arm every other shoot, leaving thereon one strong bud for a renewal cane. Those left should produce fruit during the third year. The buds left near the horizontal arm in the spring of the third year have produced shoots which in turn will produce the fruiting wood for the fourth year. It is hardly possible to answer this question very satisfactorily to a beginner but the principle may be grasped easily. Keep constantly in mind that some wood grown this year must be left. From this new wood arises fruiting wood for next year.—G. W. Reigle.

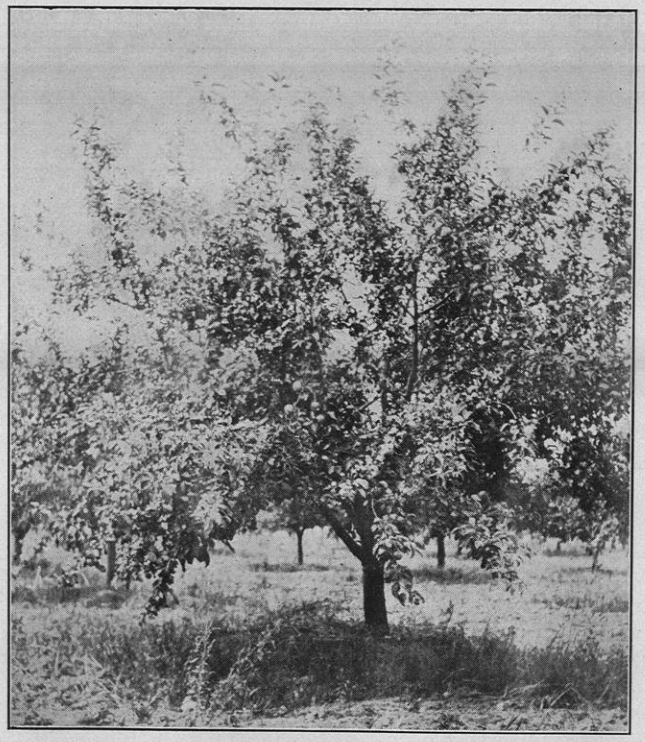
Q. Will grapes do well on sandy stony soil facing south?

Ans. Yes, providing there is enough fertility in the soil to grow corn or potatoes. Plant Concord, Worden, Moore's Early, Delaware and Diamond.—G. W. Reigle.

Q. Is it best to alternate rows of Greenings, Snow and Wealthy or can I put two or three hundred of each in one bunch?

Ans. I do not think it will be advisable to plant these varieties in blocks of two or three hundred trees. While they may be practically self fertile, nevertheless as a rule, cross fertilization gives better results than self fertilization. Therefore, I think it would be better to alternate the rows, having perhaps four or five rows of each variety, and then use for the next series, some other variety.—A. J. Rogers.

Q. In propagating young nursery fruit trees (especially apple trees) is there any preference as to any of the following methods used: Budding (splice graft and split stem graft just above the surface of the ground); graft spliced onto the whole root of a seedling tree or onto a piece of root of a seedling tree? If there be a preference in any of the above methods, which is the best and why? Does the method used effect in any way the health and growth of the tree? Will the use of any one of the above methods of grafting or budding tend in any way to produce an abnormally black heart or unsound or unhealthy condition? If so, why? If any of the above methods of propagation have defects what are they? The seedling to be budded or grafted should be of what age, Will a two year, three year, or older



Typical tree, Wausau Orchard, August, 1909.

Wealthy tree in the orchard of J. E. Bissel, Madeline Island, Oct. 1909.

seedling be as suitable as a one year old seedling? When a piece root is used, what should be the length or size of same? Should the graft contain more than two buds?

A. It is very doubtful whether there is any great difference in propagating apple trees by budding, splice or tongue graft, near the surface of the ground. None of these methods are strongly advised for Wisconsin conditions. Root grafting is the method which seems to give the best results in this state, probably due to the fact that where trees are root grafted, and by this we mean indoor grafted in winter, it is possible to secure the trees later on their own roots. There is little to choose between whole and piece-root grafting so far as the character of the resulting tree is concerned. Piece root is somewhat more economical. The piece of root which is used should be about four inches in length. I should say that the cion should contain more than two buds as a rule.

We believe in making our cions from four to six inches in length so that they may be planted deep in the nursery row in an attempt to secure roots above the union of the stock and cion, thus giving us "own rooted" trees. In planting into the nursery row, the grafts are set so that about two buds are exposed above the surface of the ground.

As a rule, one year old seedlings are preferable for root grafting. It will depend somewhat upon the growth which they have made. The only objection which could be raised to two year old seedlings is that they may be too large for securing the best unions owing to the difference in size between the cion and stock.—A. J. Rogers.

Q. Is artificial planting of nuts a success in Wisconsin?

A. Growing of nuts commercially in Wisconsin has not been carried on extensively enough to warrant its being recommended for commercial ventures in this state.—J. G. Moore.

Q. Why have the seedlings originated at the Experiment Station not been disseminated?

A. Probably no one is better able to answer this question than those connected with the Horticultural Department of the Station. It is true that some of the seedlings, particularly the apple seedlings which were started by the late Professor Goff have been growing at the Station for some time. It has been the policy of the Department, however, to test out seedlings pretty thoroly, before making any attempts to propagate them on a large scale.

The multiplicity of practically worthless seedlings which have been put out before they have been thoroughly tested has been a hindrance to the advancement in horticulture rather than a help. It is therefore the policy of the Station to know pretty definitely what may be expected of the seedlings before they are disseminated.

This work is now being carried on as rapidly as could be expected, and it is hoped that in a comparatively short time the Department may be able to send out trees of some of the sorts which seem to give indications of being of superior merit. During the present winter, there is being propagated at the Station a large number of seedling apples and plums which will in the future be given trial in various parts of the state.—J. G. Moore.

Q. I have some Northwestern apple trees on which the fruit rots badly every year. I suppose it is what is called bitter rot. Can it be prevented? I have sprayed them several times early in the season, but they continue to rot when the fruit is full grown.

A. If the disease which is effecting the Northwestern apples is bitter rot as supposed by the inquirer, then spraying is valuable in its control. The bitter rot not only attacks the fruit, but also the trees as well. One of the first things then in the control of the disease is to remove the cankered areas the same as for the regular apple canker.

We presuppose that the ordinary spraying for apple scab has been given, and the further control would be the application of Bordeaux mixture during the latter part of June and through July for the control of the bitter rot. This disease does not appear as a rule until early in July. As the application of Bordeaux is only preventive, the spraying must be done prior to the appearance of the disease.

Probably the reason why the inquirer has failed to get returns from the spray in the past is that the Bordeaux which he applied early had been washed from the trees before the appearance of this disease.—A. J. Rogers.

Q. Is the black Walnut hardy enough to prove a success in the northern part of Wisconsin?

There are several small trees in the city of Barron. These have been here about twenty-five years and though small, are in fairly good condition. The tree does much better on the bottom lands about St. Croix Falls than it does farther inland.

I would say in general that the black walnut can be grown as a small to medium size shade tree in northern Wisconsin.—Prof. L. S. Cheney.

The President then introduced Mr. C. O. Drayton, who spoke as follows:

Mr. Drayton: It gives me great pleasure to be present in this meeting this afternoon. I live in southern Illinois, in a land of apples, and I have the honor of being a life member of the Horticultural Society of the State of Illinois, so I am deeply interested in the problem that you are discussing here this afternoon. I do not mean by that that I am a scientific horticulturist, I am afraid there is a great deal about it I do not know. I happen to be in your state representing the interests of our Society. I presume some of you have heard of the American Society of Equity. One of the objects we have in this movement is the intelligent distribution of crops to the consumers. I do not know how much you have discussed that phase of the question here today as to the marketing of your apples, but it does seem to me that is a very important phase of the subject. I saw in the papers the other day that they have formed in Delaware a $5,000,000 apple trust. I wonder what that means? I wonder if that is a combination of growers or buyers or consumers; it is some kind of combination. It is nothing unusual now-a-days to hear of the formation of a new trust, but we farmers generally are very shy on that subject of trusts. The American Society of Equity is an organization of the people, not a combination to put high, extortionate prices upon the consumers, but to drop the buyer that is in between, that robs both the producer and the consumer. I say, that is one of the objects that we have. Let me give you briefly an illustration of what I mean from actual facts. In 1906 we had a fine crop of apples, the quality was good also. The growers hauled apples into Greenville, Ill., where I now live, and the buyers picked out everything almost that was not perfect, then gave us sixty and seventy cents a barrel for our apples; it cost ten cents a barrel to put them in barrels and put them on the cars at Greenville, Ill., that made eighty cents for our apples, the barrel was 30 cents, which made $1.10; the freight to St. Paul was about 51 cents, so that our best apples laid down in St. Paul ready to retail in 1906 only cost $1.61 a barrel, but if you will go up to St. Paul and find out what the

retailers actually paid, you will conclude at once as apple producers that there was too much difference between the producer's price and the consumer's price. I only bring this subject before you as a suggested one today, that you may think about it and discuss it. The American Society of Equity has for its principal object the intelligent distribution of all crops to the consumers. We believe the consumers very often pay so much for our apples that the price actually becomes prohibitive, therefore there ought to be some way by which we can have an intelligent system of distribution from our orchards, our large commercial orchards especially, to the consumers. Now, one way that I would suggest, it is a problem that we are working at, we do not claim to have solved it, but we are organized for the purpose of discussing these questions and solving problems—one way that we have tried is that of our members at Interlaken, N. Y., who have shipped to the local union direct in St. Croix, and some other counties of this state, and in this way we have been able to get the producer 80 cents a barrel more for his apples and the consumer gets them $1.00 a barrel cheaper. We believe there are too many organized forces in between the producer and consumer and that by an organization upon this plan, that the producers, not only of apples, but other farm products can break the power that is in between. Before I leave, I would like to know if there is present in the house a member of the American Society of Equity. Yes, one, two three, four, five—eight.

The President: I want to thank the gentleman for the able manner in which he has presented this subject to us. I think there is a strong inclination to know more about it and about the extent to which that society is helping the producer and I think the consumer also.

Mr. Drayton: I hope I have created curiosity enough for you to want to kiow more, that is what I wanted to do.

MY IMPRESSIONS OF THE WEST.

W. W. CLARK.

"My impressions of the west" are not more than impressions, they were obtained in a stay of some two and one-half months, mainly near the head of the Willamette valley. This valley is in the western third of the state which is watered by the rains sufficiently to produce satisfactory crops without irrigation. The vegetation is somewhat similar to that of Wisconsin.

The rainfall around Creswell and Eugene is about 36 inches, nearly all of which falls during the months of September to June, leaving a dry season of two to three months. This was the season which I observed. The rain is generally not severe, being more like Wisconsin mist. During the summer dry season crops can be grown in the field and garden without irrigation of any kind by suitable methods of cultivation. There is no doubt but that small fruits would do better during this time with artificial watering, however.

Tree fruits do very well without irrigation provided the soil moisture is conserved. It is claimed, in fact, that they do better because of the dry season during their ripening period than they would otherwise. This seemed to be true.

Agriculture in this portion of Oregon is in a very backward condition as regards modern methods, etc. The same land has been cropped without rotation for decades in many instances and appears nearly exhausted. Eastern farmers are introducing modern methods of rotation and handling, but these are not kindly accepted by the "native Oregonians," who fail to see how the eastern farmer can know anything about conditions in Oregon. As a consequence of the influx of settlers from the middle west and east, Oregon is waking up to her resources and opportunities, however, and the entire state is experiencing a "boom."

In horticulture, modern practices in spraying, pruning, planting and cultivating are followed closely. This is perhaps from necessity, it being almost impossible to raise *any* edible apples without careful spraying. As a result many home orchards are of no value to their owners, whatever; the marketable apples coming from those growers who understand their business. The contrast with Wisconsin conditions is especially marked, since

here many of our apples come from these "home orchards" which are given no attention whatever.

Prunes are an important crop of western Oregon and Washington, bringing in excellent profits. They require less care than most fruits grown there. Cherries are an important product early in July. Pears and peaches are increasing rapidly and make an excellent showing, fine peaches being produced on three-year-old trees. Small fruits are important also, the home demand being greater than the supply of raspberries, Loganberries, etc. These small fruits grow and yield luxuriously, especially when artificially watered. Their quality is excellent. Walnuts are still an experiment, notwithstanding the fact that plantations of walnut trees are set out and cared for by some enterprising corporations, for eastern buyers.

Fruit of excellent quality has been grown in western Oregon for many years but only recently has it been possible to market it with profit. This condition has been brought about by fruit-growers' unions. No enterprising grower now tries to market his fruit in any other way.

My impressions of Oregon during my short stay were most pleasant. The cost of living is no higher there than here, in general. Houses may be built for half what they cost here and the same is true of all wooden buildings. The summer climate is tempered by regular sea breezes for seventy or eighty miles from the coast, so that discomfort from the heat, even when working in the field is rare. It does occasionally get hot, however. No ploughing is attempted usually before the rains soften the ground.

After leaving Oregon I visited the irrigated regions of western Washington for a short time. Here, as was to be expected, the growth of young orchards was much more rapid than in the non-irrigated Oregon lands. The climate, however, was execrable to one coming from the east or from the coast. Dry, hot, dusty, windy, barren—the newly developed irrigated tracts seemed very unattractive. The fabulous tales of immense yields and $2,000 land seemed probable enough, however. This last season had been very unfavorable and unusual one from all reports. No peach crop was harvested in the Yakima valley and the apple crop was much reduced.

Leaving western Washington, the return trip was via the Canadian Pacific. Tales of the magnificence of western scenery

were found not to have been exaggerated, but the green trees and lawns, the yellow cornfields dotted with golden pumpkins and the freshness and civilization of Minnesota and Wisconsin seemed very welcome to eyes wearied with western wonders.

THE SMALL FRUIT PLANTATION.

R. L. POST.

The conditions which determine the location, planning, and management of a plantation for small fruits are so numerous and varied that it will be possible to give only a few scattered suggestions as to some of the factors which enter into the successful management of such a plantation.

In presenting the following suggestions I shall consider mainly the plantation which supplies a local market.

In this brief paper I shall make no attempt to define a sysem of laying out the plantation, because that will depend to a greater or less degree upon the extent and topography of the land, and upon the character of the soil. Neither shall I give advice as to the varieties that should be grown, since this depends even more upon the peculiarities of soil and climate, also upon the methods of culture and upon the kind of market.

The first suggestion which I wish to make is this—that as a general rule a large number of fruits, together with other crops, is preferable to an excess of any one fruit. By this I do not mean to convey the idea that special emphasis should not be placed upon a certain crop, or crops, but for reasons which are to follow there should be a liberal sprinkling of other crops. Of course it cannot be denied that decided advantages arise from specialization, but I believe that for a retail market it is much more profitable to adopt the plan which has been indicated.

In the first place it necessitates the proper handling of the soil, or, in other words, it brings about the practice of rotation, with all the benefits accruing therefrom. One of the most important things to consider in this connection is the combating of insect and fungus pests, for by varying the crops on a given piece of land the life processes of these pests are seriously interrupted, if not entirely suspended, thereby decreasing materially

the extent of damage they may cause. This is especially true as regards those pests which cannot be held in check by spraying, although the same principle applies to the others as well. For this reason alone it would seem the diversification for the purpose of rotation were more than justified. Perhaps this may appear to be a rather sweeping statement, but to those who have seen, for example, a strawberry bed almost wholly destroyed by the white grub, it will not seem unreasonable.

I suppose it is scarcely necessary to speak of the other benefits derived from rotation. One of these is the maintenance of good physical conditions in the soil, which results in the greater availability of the fertilizing constituents, with a consequent superior quality of product. An economical use of the fertilizing elements is another important advantage. The utilization of labor which results from rotation and diversification will be discussed under a different head.

Perhaps the most common error which a grower is apt to make in connection with rotation arises from the fact that a particular piece of land seems peculiarly adapted to the production of a certain crop. For the mere reason that the crops are better than the average the first year or two, he is inclined to assume that such a condition of things will continue indefinitely, and will not only defer turning under the patch until after it has seriously declined in usefulness, but even after it is plowed he will replant it with the same fruit without devoting the land for more than a year or two to the growth of unrelated species, such as vegetables. We are apt to forget that a setting of small fruit occupies the land for a number of years, instead of one year, and that other crops in the rotation should be grown for a corresponding length of time. True, it may be possible so to care for the plants that the same fruit may be produced successfully for a long period, but it is evident that, with increasing age, the difficulties of maintaining proper tilth, fighting weeds, and controlling pests will necessitate a greater and greater expenditure of labor and money.

The second object of growing a wide range of products is to make possible the development of a comparatively fancy trade. We know that in most cities almost every consumer has a somewhat different taste from that of his neighbor, and therefore it behooves the grower to take advantage of these preferences. In so doing he will almost unconsciously exercise greater care in growing, harvesting and marketing the crop than he otherwise

would, thus producing a better quality of fruit. This would result in an increased demand for the product, which means that the grower could command higher prices.

A third advantage of having a large number of classes and varieties is that it makes easier the disposal of the fruit at a reasonable profit. This is true partly for the reason which has just been mentioned, that the demand is apt to be greater than when only one or two kinds are for sale. Further than this there is not apt to be an excessive amount of any one kind placed upon the market at a given time.

One thing which I believe is neglected in a large number of cases is the economical utilization and distribution of labor. The first of these has been mentioned in connection with the subject of rotation, and it may readily be seen that a large number of different crops are necessary if the labor is to be kept busy all the time, because in many instances the various crops supplement each other.

Assuming now that we are able to utilize the labor and equipment to the best advantage as regards time, the next problem which presents itself is how to gain the maximum profit per unit of time and labor expended. It is obvious that some crops are more profitable than others, and in most cases these are just the ones which require the most care. On the other hand, the grower, realizing the importance of a particular crop, may give it more time than is profitable at the expense of another crop, which, though less profitable, would yield better returns for this extra amount of labor. Not only this, but small patches upon the plantation will be entirely neglected, thus becoming breeding places of weeds, diseases, and insect pests. In these cases it is undesirable to neglect the patch, even though no immediate profit is the result, since it results in seeding down the premises with weeds, as well as infesting the remainder of the plantation with noxious forms of insect and fungus life.

There is one phase of small fruit growing which I believe ought to be emphasized, and that is home experimentation. With small fruits it seems to me that this is almost an absolute necessity, because the success or failure of many varieties depends solely upon the particular locality in which they are grown. Home experimenting is of advantage for two chief reasons. The first reason is that the grower is enabled to see results for himself without taking somebody else's word for them. He knows exactly

what conditions have been supplied and the effects which those conditions have produced. The facts cannot be questioned and he is obliged to accept the truth whether he wishes to or not. Furthermore the actual observation of results will leave an impression upon his memory which mere reading or heresay could not begin to make.

The second great advantage arising from home experimentation is that the conditions supplied are exactly the same as those under which the fruit is grown, both as regards soil and climate, and as regards the treatment given the plants. If the experimenting were done elsewhere, some essential difference in conditions might be overlooked.

The chief classes of experiments which might well be conducted on the farm are first, those which are concerned with the trying out of different varieties, and second, those which have to do with various methods of treating those varieties which are already established on the plantation. It is not at all necessary to have an elaborate system of carrying on these experiments; in fact, such a system should be discouraged. Take for instance the trying out of a new variety of raspberries. It is a simple matter, when setting out a new patch, to put in a few plants of the variety to be tested. It then receives exactly the same treatment that is given the rest of the patch, and a fair judgment of its qualities can be made. As a simple example of the second kind of experiment we might take the uncovering of strawberries in the spring. We know that the time of doing this influences the earliness of the crop as well as the yield. It would necessitate very little trouble and no extra work to remove some of the covering earlier or later than when the main portion of the patch is opened.

One of the problems connected with the growing of small fruits is that of giving the plants a good start. One factor which is essential for this is to be sure that the soil is in proper condition to receive the plants, but this cannot be discussed here. Another factor is the proper setting of the plants. The third factor is one which is concerned with the plants themselves, and this is the one which I wish to dwell upon.

Now what are some of the essential qualities of a plant which is about to be set? In the first place it should be sound, vigorous and healthy, so that it will lose no time in becoming firmly established in the soil before the possibility of injury by drought,

insect and fungus pests, or other adverse conditions. Secondly, the plant should be adapted to local climatic and soil conditions, for, no matter what is the excellence of its condition, it will always be handicapped if it is not adapted. Another desirable quality is resistance to disease, although this is not so important if precautions are taken concerning rotation and cleanliness.

How shall we manage to secure these desirable qualities? There seems to be but one safe and sure way, and that is to propagate and select the plants for ourselves.

The first advantage of home propagation is that the grower can have a large number of plants on hand, and can select those which are in the best of shape as regards size, vigor, and soundness. He can manage so that the plants will not be out of the ground for too long a period, because he knows when he will need them and can suit his own convenience. The plants do not have to be handled so much as they do when shipped, and consequently are not apt to lose vitality. It is obvious that with all these advantages the plants have the best possible opportunity of getting a good start.

If the plants have been propagated on the same plantation upon which they are to produce fruit it necessarily follows that they are more likely to be adapted to local conditions than if propagated a number of miles distant. We know how susceptible the strawberry is to changes in location. A certain variety may do perfectly well on one plantation, and if thansferred to another, or even to a different place on the same plantation may be a total failure.

The third advantage of home propagation is that the worry and trouble incurred in ordering and shipping the plants is obviated. As a general rule it is little more trouble to dig the plants than it is to take care of them after they are shipped, and of course, they cost nothing in the way of money. There is little possibility of making mistakes, and, if any blunders are made, the grower has nobody but himself to blame.

Another prominent factor enters in when home propagation is practiced. The work is under the direct personal supervision of one who is to take the consequences of his own labor, and as a result he will exercise more care than anybody else would. He has first choice of the plants, does not have to accept inferior stock, and therefore is less troubled with killing out, and the labor and expense incurred in replanting.

Finally, if a person propagates plants for his own use he will become a keener observer of the characteristics of the plants with which he is dealing. He is obliged to look into the details of their make-up and development, and this is conducive to success, not only in the growing of small fruits, but of other crops as well.

I have touched upon only a few of the factors which, to my mind, influence the degree of success to be attained in the management of a plantation for small fruits. In some instances I may have drawn defective conclusions, but I believe that most of the things I have mentioned are worthy of our consideration.

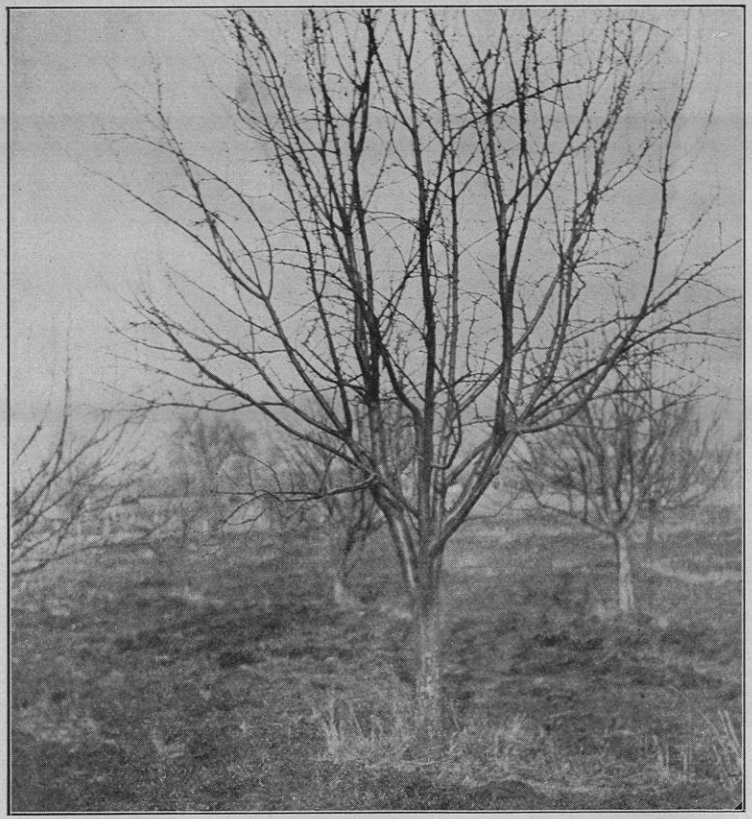
THE DOOR COUNTY FRUIT DISTRICT.

A. L. HATCH, Sturgeon Bay.

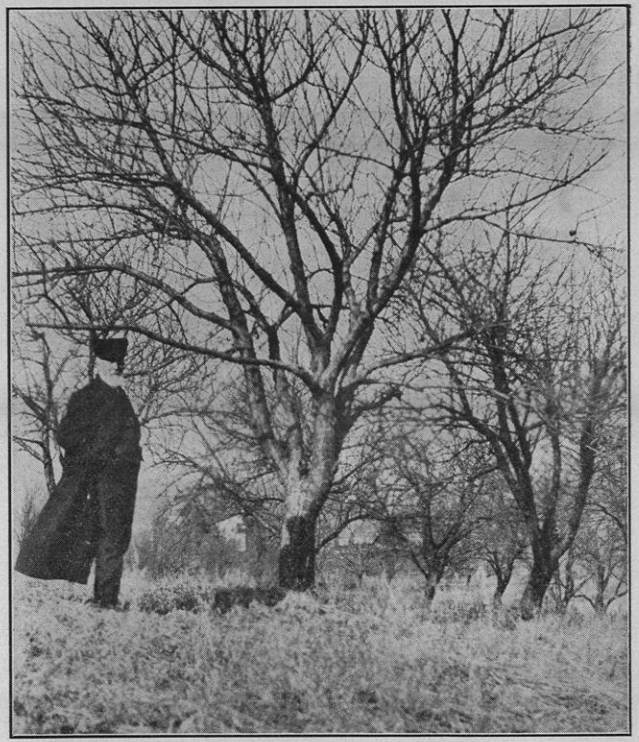
The continued success of fruit culture at Sturgeon Bay is now attracting considerable attention. Especially is this true of cherry culture, which is expanding rapidly. In common with most of the Door county peninsula this region has some advantages for the growth of several fruits which have been demonstrated to be very valuable and reliable for every season. In fruit culture, as in every other business, success depends upon certainty of returns. Where conditions favor full crops every year and where the fruit develops to perfection, and where it has perfect shipping qualities, there exists the foundation for profitable commercial fruit growing. And when these conditions are supplemented with good shipping and marketing conditions, and when the business is already well established for co-operation among growers, there exists still further advantages.

In all of these the Sturgeon Bay region is especially fortunate. The first planting of fruit trees in considerable quantities were made about fifty years ago and during all those years there is no record of a loss of bloom by spring frosts. This is a record assuring a greater certainty of crops than is found elsewhere in most of the so-called fruit regions.

We have at Sturgeon Bay a cool spring long drawn out that prevents such early bloom, and gives fruit trees a chance to make a strong recuperative start of buds and bloom that has



Wealthy, orchard L. H. Palmer, Baraboo, planted spring of 1900, bore 1 barrel choice No. 1 apples in 1907 and heavy crop, 1909.



Fameuse, orchard of J. S. Palmer, Baraboo, age 25 years. Cultivation, alternate clover sod and cropping with corn followed by oats. Heavily manured every 3 or 4 years. Four hundred similar trees bore 1000 barrels, 1909. (See Rep. of Sec.)

great capacity to endure frost if it should occur. Not only is the bloom thus made hardy but the severest cold to which trees are subjected is abated in such a way that no injury results. These conditions are brought about by the influence of the lake and bay water upon the climate. And these influences are permanent and reliable—something to be always counted on as a factor in fruit culture here.

Another asset of this water influence upon the climate is its effect upon the character and quality of the fruit itself. This is very markedly shown in the keeping and shipping quality of the fruit grown here. Never subjected to the long continued and high temperatures of regions south and inland the fruit of all kinds has a firmer and better texture usually that adds very much to its life and capacity to endure shipment without hurt. Of all the cherries, for instance, that I have grown here, amounting to several thousand bushels, I do not remember any loss from failure to hold up in shipment. Any variety of apple that we grow will keep much longer than the same variety grown elsewhere in Wisconsin. Not only can we end the market with Duchess and Wealthy when others have done, but we can furnish such sorts as Snow apples in fine condition well into winter. And still more we have some kinds that will keep till spring as sound as desired. These facts point to a fine field of profitable apple culture that is now beginning to attract some attention.

The soils of Door county peninsula are founded upon Niagara limestone. Both in the pine and hardwood region it is a very valuable factor for fruit growing. When properly selected especially with reference to depth above the bed rock, subsoil and exposure, it ranks well with that of any other region. Here clover and all grasses thrive finely, assuring the conditions to secure desired humus and soil enrichment.

The first commercial planting of the cherry was made in 1896–8 by myself and the late Prof. E. S. Goff of Madison, Wis. In the latter year I induced Mr. A. W. Lawrence to plant five acres and from the success of these and other orchards the possibility of very profitable cherry growing has been fully demonstrated. Ever since the trees were large enough to bear they have borne paying crops, the combined crop of last season amounting to over seven thousand crates or about 13 carloads. For a series of five or six years the average net returns would capitalize the land at over $3,000 per acre. There is promise of some younger

orchards doing better than this for in the case of my own orchard it should be understood that in it I have tried out several varieties that were unprofitable. I also made some mistakes of planting and management that are now being avoided by later planters. It is a pleasure to know that many younger men are now engaged in a broader and stronger development of this splendid industry.

NOTES ON GARDENING.

BLANCHARD HARPER.

A Protecting Screen.

The idea is not original, none of mine are, merely adaptive, or adopting—I can not remember where I read it originally, but as I use it, it is as follows:

Get a number of heavy pieces of galvanized iron wire, Nos. 10 or 12, I think, cut into four feet lengths, then procure a number of yards of "tobacco" (i. e., that used to screen tobacco plants) cheese cloth, in which tucks half an inch deep are run, at intervals of seven and a half feet. Run a wire through each tuck so that six inches projects beyond the cloth on each side to be stuck in the ground. In case of a high wind it is advisable to pin the windward side to the ground between the hoops. I use mine as a protection against spring and autumn frosts, summer sun, and when watering a favorite row during a drouth. It enables me to lengthen the season of tender vegetables about six weeks every year. In the autumn, when the snow flies, I have the cheese cloth washed and use it year after year, and have done so for three years. I have also light frames fitting in place of my cold frame sash covered with cheese cloth, instead of being filled with glass, which I use to start young seedling in hot summer weather. It is a great protection also against a burning summer wind, or a beating rain. I always remove it at night in hot weather and replace it in the morning as long as needed, and in cold weather, put it on at night and take it off when the sun shines. It is particularly useful in transplanting young lettuce, asters, endive, celery, etc. Try it!

Lettuce.

Many home gardeners do not appreciate the vast difference in the many varieties of lettuce offered in the catalogues, and very few realize that there is a greater difference in the success in growing lettuce due to the selection of a variety suited to the soil of the garden. Lettuce likes a light, mellow soil, but suppose the home garden is composed of a hard, yellow clay soil, or a peaty, marshy soil, shall the gardener forego lettuce? By no means, but in order to win success, he must try many different varieties and then select the ones which do best in his soil. A marked instance of this suitability came to my notice last year. A new neighbor who had recently come from Michigan, where his garden had been on a reclaimed marsh, asked "What lettuce grew best in our location?" He named over a number of varieties, Big Boston and others, to all of which I objected as having been failures with me, being tough and bitter. Then I named the varieties I had found suited to the soil and location. "Well" he said, "I am going to try both your kinds and mine. My varieties did so well with us, I hate to give them up, but I will take your advice and plant your selection too." He did so, and could not eat any of the varieties he found successful in Michigan, but found my choice gave him a succession of delicious lettuce until frozen up. Do not be discouraged if your home grown lettuce is poor, send to the Supt. of Public Documents in Washington, fifteen cents, and ask for Bulletin No. 69, Bureau of Plant Industry, Dept. of Agriculture, American Varieties of Lettuce by W. W. Tracy, Jr., and from a study of that select varieties to experiment with your soil.

I unfortunately kept no notes of my first trials, and so do not care after five years to make definite statements in regard to them. I have tried in all about twenty to twenty-five varieties, and for my soil, which is a hard clay, on an exposed hillside, swept by the prevailing west winds, without any pumping or mechanical arrangements for watering, I have found great satisfaction in the following varieties: First choice—May King, Black-seeded Tennis Ball, Crisp as Ice (also called Hartford Bronzed Head) Paris White Cos. Mignonette. Third choice—California Cream Butter, Deacon, Maximum–Hanson. Poor—Grand Rapids, New York, Golden Cos, Big Boston, Iceberg.

I make my first planting in a cold frame, from which I transplant a few heads to the open ground, and eat the remainder thinning it as it grows. I like May King and Black-seeded Tennis Ball for this. Then as early as possible, I plant in the open, five foot rows of May King, Black-seeded Tennis Ball, Mignonette and Crisp as Ice (listed by only one seedsman, that I know of) and any new varieties with which I am experimenting. When these are large enough to transplant, I set out as many as I want in rows one foot apart, and eight inches or a foot in the row, to head. Meanwhile I have been thinning the rows as required and eating what I thinned out. In about two or three weeks I make another planting including Paris White Cos, and my last about August 1. In the last planting I make my rows three times as long and thin in the row for heading as well as transplant because I find that transplanting at that time of the year sets the plants back enough to make a much later crop. By covering these transplanted heads, with the cheese cloth screen, or lifting a few to the cold frame, I have had lettuce until the middle of November.

The soil is prepared with manure as usual before ploughing and dragging, and then fined all the old powdery manure raked up from where the big pile stood. that I can rake or work in, I put in. When my seedlings are up, I water the ground once a week or ten days, with a solution of one ounce of nitrate of soda in one gallon of water, and continue to do so until the heads are well formed. When the seed is sowed and watered I cover the ground in hot sunny or dry weather with the cheese cloth screen, and the August planting is grown almost entirely with it until September brings cooler days. Please let me konw the result of your experiments?

HINTS FROM AN OLD MAID'S GARDEN FOR HOME GARDENERS.

Beans. Home gardeners are usually limited as to space and time, and therefore will find bush beans and dwarf peas more economical in brush, poles, wire netting, ground space, and cultivation as to area, than the tall growing sorts.

Those who have not tried the bush lima beans miss one of the chief delicacies of the garden. Many suppose that the limas will not ripen here because our season is too short, but I get here in Madison, a good long season of them.

The *Fordhook Bush Lima* is comparatively new, is prolific although not equal in that respect to Wood's Prolific, early, rich, buttery, and delicious, belonging to the potato lima class.

The *Thorburn (or Dreer) Bush Lima* is similar to the foregoing, but much later, bearing until the garden is entirely frozen up. It has been my stand-by for several years, and the beans are delicious cooked fresh or canned.

The *Wood's Prolific Bush Lima,* an improved edition of Henderson's Bush, belongs to a different class of bean, the sieva bean, and to my taste is not as nice as the two first named, but it is useful as coming between the two first in point of time, as affording a change of variety, and also and chiefly because of its ability to withstand drouth. In my garden last year the Fordhook matured for picking before the drouth, the Wood's Prolific furnished good picking during the drouth, while my favorite Thorburn's were laden with pods which shrivelled and dried up. As soon as the rain came the Thorburn's blossomed and would have had a good crop again, but were frozen down just before the beans were ready to pick.

I plant them all in well manured ground, sprinkling in addition artificial fertilizer over the row at the time of sowing and two or three times more between the time the plants come up and pods are formed.

Last year one of the pleasant surprises the garden gave was the fine crop obtained from a twenty-five foot row of Early Valentine beans in September and October. During the drouth when the ground was baked so hard in the hard clay forming my soil that I had to chop out the furrow with the point of a potato-hoe I sowed my Early Valentines. After digging the

furrow, I watered it thoroughly, then put in the beans and covered them half the depth of the furrow, about two inches with earth, which I watered thoroughly again, and then filled up the rest of the furrow with dry earth. The plants came up in the usual time without further watering and bore a fine crop, assisted by the cheese-cloth screen, until well into October.

CANNING VEGETABLES FROM THE HOME GARDEN—SUPPLEMENTARY NOTES.

BLANCHARD HARPER, Madison, Wis.

(See Vol. XXXIX, p. 214.)

Everyone interested in the canning of vegetables as described in my notes in the Report for 1909, should procure from the Agricultural Dept. at Washington, Farmer's Free Bulletin No. 359, "Canning Vegetables in the Home." Naturally I prefer my own methods, but the bulletin contains so much that is valuable that every one interested in the subject should secure a copy.

One fact stated there solved for me a problem that had long puzzled me; namely that peas gathered from the same vines within a day of one another should taste so differently when canned. A farmer grew for me two bushels of "Advancer" peas picked them in the evening and drove six miles the next day to deliver them. They seemed in good condition. I canned some that day and the remainder the next. Those cans of peas kept perfectly—there was no sign of spoiling, but they were as flat and tasteless as sawdust. I find the explanation in the following statement the author of the bulletin Mr. J. I. Breazeale, makes in regard to corn, one which I believe holds true in regard to all sweet vegetables, and on which too much stress cannot be put. After stating that vegetables should be gathered fresh, if possible with the dew on them, and kept damp

of corn the amount of sugar diminishes very rapidly after the

ear is pulled from the stalk; therefore in order to retain the original sweetness and flavor it is necessary to can corn very soon after it is pulled, within an hour if possible." Incidentally I may add that *for table use* I have kept corn twenty-four or forty-eight hours with but slight loss of flavor, by laying each ear in the husks *directly on ice,* but not in any other way.

The following recipes are in use by several successful housewives and are contributed as affording a means of keeping corn when otherwise variously possible conditions would prevent canning.

Canned Corn. (Mrs. Frank Mac Connell.) A recipe very generally used. To 9 pints of fresh corn cut from the cob, add one pint of sugar, and one pint of salt (if the salt is very strong use ½ pint), and three pints of water. Boil all together for five minutes and pack while hot in thoroughly sterilized jars. To serve soak in several changes of water to remove the salt; cook with a little cream until scalding hot.

Dried Corn, as made on the *Turvill Farm,* by Mrs. Elizabeth F. Wood. Gather tender fresh corn, boil it in water three minutes, drain and cool; then cut the grains from the cob, but not too close. Spread the kernals in a thin layer in a large pan and place in a *cool* oven, stirring and shaking from time to time to allow it to heat and dry evenly for several hours. The flavor seems better if the drying is not prolonged over a day. When dry store loosely in a paper bag kept in a dry place. To serve, soak over night in water, then simmer gently on the back of the stove for several hours, and add butter and cream before sending to the table.

Dried Corn as made by *Mrs. Albert J. Lamson.* Gather the corn when best for the table, score the kernals with a knife and press out the pulp, or use a "corn scorer." Take as many enameled pans or plates as required, grease them lightly with butter and spread the pulp thinly over the bottom of the plates, the layer should not be more than ¼ inch thick. Place the pans in an oven not warm enough to burn or scorch the corn, but warm enough to cook it, and allow them to remain until the corn thickens, so that it can be cut into wafers 3 inches square. Gently turn the wafers to allow the under side to finish drying in the now cooler oven, or finish the drying in any suitable warm dry place. Corn begun in the morning should be done

and cool until used, he says, when he speaks of corn, "that experiments * * * have proved that in the sweet varieties by night. To serve, soak the wafers a few minutes, and cook with salt, butter and cream.

WISCONSIN A FRUIT STATE.

(Read by G. W. REIGLE at the National Land Congress, Chicago, Nov. 15th, 1909.)

Nearly 54,000 square miles. If we were to pick up the state of Wisconsin and spread her over the states of Maine, New Hampshire, Vermont and Massachusets there would be left uncovered just enough foreign cranberry-bog to bury without ceremony and without a tear the entire Minnesota foot-ball aggregation.

Wisconsin follows the fashion of the north in persisting to elect republican governors and emphatically proclaims J. O. Davidson the most democratic executive she ever had.

Her senators are known from ocean to ocean each occupying pedestals coveted by many anxious friends of the people; one is accused of having amassed a million but totally lacking in the ability to spend it, according to the moral standard set up by his critics; the other is charged with unprofessional irregularities in politics, often calls the roll, meets all gradiators, bunched, in the political arena and the latest advices report him very much alive.

Wisconsin has the greatest University in the west, her cities are annexing farm lands in every direction to accommodate their amazing growth; her farmers are becoming rich and her thousands of undeveloped acres are rapidly becoming the dwelling place of properous and happy immigrants.

Is Wisconsin on the map commercially? Let us see! Chicago lies just off the south-east corner, Milwaukee and other large cities near by. Duluth, Superior, St. Paul and Minneapolis nestle at the corner diagonally across the state. Shall I say that Kansas City and St. Louis are near the south-west corner? Some loyal Badger must say, yes; and also that trade routes by

rail and by water with each of these centers are so common and so numerous that they no longer create comment nor surprise. "Where is this state?" did I hear you say? Just take a map and find the state whose contour resembles an old right-hand buck-skin mitten and you have it; a state in every way worthy of the most enthusiastic commendation.

Regarding the rank Wisconsin holds in the gross production of fruits an honest estimate will place her below Michigan and New York. However the possibilities of making Wisconsin a fruit state of first rank is not only predicted by many of our formost fruit men; but is actually believed by many long-headed business men who today are investing in land they consider to be suitable for orcharding.

The influences, not insurmountable by any means, which to the writer seem most antagonistic to apple raising in particular are: First, the length of the time required to establish an orchard before returns may be expected, Second, the technical skill and experience necessary to control successfully the injurious insects and fungi, and Third, the difficulty of receiving renumerative prices during periods of extraordinary production.

Notwithstanding all these handicaps and the over shadowing dairy industry there are several counties where the success of commercial orcharding has been demonstrated as satisfactorily as a proposition in geometry. These counties embrace Kewaunee and Door with Sturgeon Bay as a center, Marathon in which at Wausau is located our best trial orchard. Other counties especially noted for excellent crops of apples are Winnebago, Manitowoc, Sauk, Richland, Crawford, Monroe, Eau Claire and Chippewa. These sections have orchards of bearing trees from seven years old to seventy, the acreage in one instance reaching as high as sixty acres. In proof of what has been said above Secretary F. Cranefield of the Wisconsin State Horticultural Society has kindly furnished me with the following data: There are eight acres of apple trees in the Wausau trial orchard established in 1897 by the Wisconsin State Horticultural Society. When the Wausau orchard was 10 years old, sixteen hundred bushels of salable apples were harvested and this year (1909) twenty-two hundred bushels of apples by measure have been reported.

Near Chippewa Falls, this year, Mr. James Melville harvested over sixteen hundred bushels of Wealthys, about five hundred

bushels of Oldenburg, and two hundred bushels of varieties mixed. The Wealthys were allowed to ripen fully and fall to the ground; afterwards they were gathered in "gunny" sacks, loaded on a hay-rack and sold for one dollar per bushel in local markets. Mr. Andrew Moholt, Eau Claire, has a forty acre orchard, one-half now yielding him handsome returns.

Mr. Palmer, Sauk Co., reports a crop from a three-acre orchard of Wealthys and some other varieties selling for fifteen hundred dollars and the average yield for a term of years netted him between three hundred dollars and five hundred dollars each year.

Mr. John Reis, Richland Co., writes "I have sold 675 barrels from a twelve acre orchard for eighteen hundred dollars net. My most profitable seller is the McMahan."

Door and Kewaunee Counties had a surplus this year of 20,000 barrels. The surplus for the state at large is estimated at 65,000 barrels.

My observation establishes these facts: 1st, That the best site for an orchard is on the elevated fertile limestone ridges. 2nd, That certain hardy fall apples should be chosen for planting. 3rd, That the commercial orchard cannot be conducted as a side line. 4th, That Wisconsin is each year producing apples superior in quality, and just as handsome as any other state in the Union.

You have heard of the apparently sensational reports from northern Wisconsin exploiting the sour cherry industry and the nominal cost of land on which they may be grown. Allow me to submit reports made by well known business men who live in Sturgeon Bay. This year Mr. A. L. Hatch received four thousand fifty-eight dollars and thirty-five cents from seven hundred 12 year old trees occupying 8 acres. Last year, 1908, he sold the crop from the same trees for $3,200.00 ($400.00 per acre).

Mr. Lawrence's crop from 600 twelve year old cherry trees this year sold for $3,966.00 ($500.00 per acre).

Mr. D. E. Bingham writes: (I quote from our last report.) "The gross receipts from eight acres of cherries for six years beginning the fourth 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 ten years, the whole time since the orchard was planted."

The strawberry and bush fruits are grown with ease and profit anywhere in the state, the profit of course will vary as distances

from good local markets vary, and where shipments are necessary much will depend upon rapid transit faculties and the organization of the fruit growers.

Sparta and Eau Claire are very important strawberry and bush fruit centers. The Sparta acreage of the strawberry will approximate 500 acres together with an additional 100 acres covered with the raspberry and the blackberry, etc.

Seventy-two thousand dollars worth of small fruit were shipped from the Sparta station this year.

Hon. C. H. Daub, Eau Claire, believes that more small fruits are now shipped out of Eau Claire than out of Sparta. (No accurate data however is available.)

Strawberries, raspberries and blackberries when grown near a market like Madison, Wis., or shipped by an association organized as well as the Sparta association will yield a profit of from $500.00 to $800.00 per acre. The Americana plum and the early varieties of the Concord type of grape have proven very profitable also when grown by a specialist. But I weary of these dollars and cents details in fruit raising though they are vitally important to those who would engage in this business.

This brief and hastily written paper would lack its most essential feature should no reference be made to the organization and the old Patriarchs in Israel who have fostered and stimulated this industry. The Wisconsin State Horticultural Society now has a membership of about one thousand members which fact should indicate a growing interest in horticulture.

This Society is maintained by a liberal annual appropriation from the state treasury. This money is disbursed by an executive board which is elected by ballot from the membership of the Society.

The Society has assumed a variety of activities; viz.,

1st. The establishment of trial orchards and vineyards for testing the different varieties of fruit and vines; the testing of soils, climate, conditions and drainage.

2nd, Demonstration orchards.

3rd, Renewal of old orchards.

4th, Beautifying of the grounds of the common district schools (new work).

5th, Conducting a correspondence school, through which helpful answers to all questions bearing on horticulture are sent

without cost to every enquirer. This department is conducted almost wholly by Mr. Cranefield, our secretary.

Besides the information bureau referred to the society issues each year four bulletins on vital horticultural subjects.

Our annual report is a compact, illustrated bound volume containing an entire year's transactions of the Society. The president for this year is William Toole, Baraboo; the Secretary, Frederic Cranefield, Madison, Wis.

A notable feature of the societies attractions for many years has been two exhibitions yearly of fruits and flowers (not grown under glass) in competition for generous premiums.

Every since the trial orchards have begun to produce fruit the society has displayed samples of the products of these trial orchards at the Wisconsin State Fair, an attendant being present at all times to answer questions and to volunteer expert advice to prospective planters.

This year, 1909, instead of the fruit display at the State Fair the society assembled a spectacular display of spraying machinery and their accessories, ranging in size from the tiny hand bulb spray to the immense power sprayers suitable for the largest orchards. As a part of the same display certain well-known manufacturers of chemicals were invited to exhibit poisons which are necessary to combat successfully the numerous insect pests and fungi of plants, vines and trees. Some of these companies placed skillful chemists in charge who demonstrated the chemists method and the ordinary method of compounding spray mixtures for orchards and other plant life. This display I regard as the most opportune action of the society for many years.

In conclusion I maintain:

1st, That Wisconsin is the hub of the commercial wheel in the United States.

2nd, That Wisconsin soil, climate and rain fall; the anglo-saxon predominancy of its people; its thousands of acres of cheap arable lands are of themselves inducements for capital and labor, not duplicated on this continent.

3rd, That Wisconsin orchardists do grow apples which for size, beauty and quality have won gold and silver medals and grand prizes whenever they have been placed in competition at World's Fairs.

4th, That Wisconsin now has a strong conservative organization made up of wealthy business men and earnest thorough-

going practical fruit growers whose united efforts must result in winning for Wisconsin three jewels of inestimable value to humanity.

Wisconsin First in apples!

Wisconsin First in cherries! !

Wisconsin First in the luscious strawberry! ! !

November 15, 1909..

REPORT OF THE EAU CLAIRE FRUIT GROWERS' ASSOCIATION.

The Eau Claire Fruit Growers' Ass'n. was organized in 1902 and has held monthly meetings from that date. The year 1909 has been the most successful year we have had although we had a short crop.

As an association we are working together and improving our ways of marketing our fruit, improving our Laws and By-laws and 1910 finds us in a flourishing condition with money in the Treasury and a good feeling among our members.

We have 102 members in good standing. We marketed about 15,000 cases of strawberries in 1909, and there was about the same amount shipped by private growers.

Duluth is our market and we have ideal shipping facilities. The car is closed at 5 o'clock and the retail trade, in Duluth, can have them at 7 o'clock next morning as fresh as if they had picked them out of their own garden.

The association at present handles strawberries only but we expect to handle raspberries and blackberries the coming season.

Eau Claire County is coming to the front in raising small fruits and the acreage is increasing fast. We are also producing lots of apples and plums and new orchards are being set out and old ones enlarged and we are advancing slow but sure.

The strawberry crop for 1910 looked most promising when they were mulched in the fall and most all growers had a nice stand of plants in spite of our dry summer.

BAYFIELD, WIS., Jan. 15, 1910.

To the Wisconsin State Horticultural Society:
Madison, Wisconsin.

In the last four years the Bayfield Peninsula has made wonderful progress in the fruit industry. Prior to that time there were no commercial orchards or commercial advancement in the small fruit line. Our citizens had made no effort in that direction and had given it no thought, and most of them thought that fruit as a commercial enterprise for this section would be a failure. They were governed too much by the opinion of our neighbors south of us; "too far North" was the cry. Notwithstanding, they themselves had been growing all varities of small fruit for home use, and some varities of apples and cherries for thirty years, and their success in this small way never prompted them to try it commercially. A few citizens finally did wake up to this suggestive object lesson and began to set out trees and small fruit and to talk fruit to their fellow citizens. Of course some laughed in your face, some pitied you for the money you were squandering, and some listened to you and talked it over with you inquiringly, and then went home and talked over the truths you had brought to their notice, and finally began to set out trees and small fruit, and were successful in their efforts. This success of some made the others take notice and brought them to realize what had been done, and they began to absorb the fruit venture and began the work of fruit growing themselves, and to-day you can scarcely find a knocker in our district. They have all been taught to believe in the future of this district as a fruit country commercially. We have organized a Horticultural Society of about one hundred members, and through the society, much educational work has been done, and many beginners are on the road to growing fruit for the market. In the last three years our district has put out about twenty-five thousand apple trees, and twenty thousand cherry trees. There were two cars of cherry trees brought to Bayfield this fall, containing 17,000 trees. There were also several thousand apple trees brought in for planting next spring. Men are coming in with the expectation of growing fruit, and are clearing up land for that purpose. We would move forward faster were it not for the fact that our land

is all stump or timber land, and has to be cleared before they can plant trees or small fruit. Cleared land cannot be bought at any price, as about all the cleared land is owned by men who are in the fruit business or expect to engage in it, or have cleared the land for that purpose. There will be over one hundred acres of strawberries to pick this year. Some are setting out blackberries, raspberries, and currants commercially, but these fruits are not in bearing. This year there will be but little of this fruit for sale outside of home markets. All of our small fruit and cherries have been thoroughly tested out and can be no failure in the growing.

As to apples, outside of the Duchess, Yellow Transparent, Wealthy, and Crabs, other varieties (many of them), have been planted, and the trees are growing fine, and in a few years will be tested far enough to know what varieties to grow in our district. A few trees were in bearing this year of the following varieties not before tested: The Patten Greening and Dudley. These trees bore remarkably fine fruit and attracted much attention from the fruit growers. Take it all through, the fruit industry on the Bayfield Peninsula looks very promising.

WM. KNIGHT,
Delegate from Bayfield, Wis.

THIRTY-SEVENTH ANNUAL REPORT

OF THE

WISCONSIN

Dairymen's Association

HELD AT

Barron, Wis., February 10, 11 and 12, 1909.

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, WIS.
DEMOCRAT PRINTING COMPANY, STATE PRINTER
1909

LETTER OF TRANSMITTAL.

WISCONSIN DAIRYMEN'S ASSOCIATION,

Secretary's Office,

FORT ATKINSON, Wis., Nov 30, 1909.

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-seventh 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 Barron.

Very respectfully,

A. J. GLOVER,

Secretary.

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ROSENDALE, FOND du LAC COUNTY.

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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 FAVILLE, DANE COUNTY,
President 1886. Died —, 1903.

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.

MEMBERSHIP, 1909.

Atwater, J. T., Barron.
Augst, S. W., Cameron.

Borum, C. J., Barron.
Bowen, R. W., Bangor.
Brown, J. R., Barron, R. 1.
Britzman, Wm., Barron.
Barret, W. H., Barron, R. 3.
Borum, Geo., Barron.
Beckwith, Wm., Barron
Brown, W. L., Barron.
Bartlett, Wm., Barron.
Berg, Martin, Barron.
Borgen, John, Dallas.
Borgen, Hans, Dallas.
Berger, Ole H., Chetek.
Baker, W. H.. Barron.
Brennan, W. J., Tomah.
Biegler, Harlad G., Barron.
Bowen, J. E., Barron.
Bartlett, C. M., Cameron.
Bandli, Christ, Rice Lake, R. 5.
Bandli, John, Rice Lake, R. 5.
Bonet, W. H., Barron.
Bowen, O., Barron.
Baer, U. S., Madison.
Buchanan, Byron, Barron.
Burnham, Frank, Barron.
Burdick, F. H., Barron.
Beckwith, J. R., Barron.
Blassingham, C. D., Barron.
Brown, W. L., Barron.
Boyum, And., Barron.
Borum, T. W., Barron.
Bartlett, C. E., Cameron.
Bootz, John, Cameron.
Barfknecht, Frank, Barron, R. 4.

Coe, J. H., Barron.
Chessman, J. B., Racine, Wis.
Crawford, A., Barron.
Cramer, S. S., Milwaukee.
Clark, W. H., Rice Lake.
Crawley, J. P., Barron, R. 3.
Christianson, Robt., Barron.
Coe, C. C., Barron.
Crane, F. R., Menomonie,
Clark, John J., Berlin.
Corneliuson, T., Madison.
Cuthbert, J. C., Barron.
Coleman, Dr., Barron.
Cook, Geo. B., Cumberland.
Christianson, S., Barron.
Charles, L. P., Chetek.
Cheney, L. S., Barron.
Cuthbert, Roy, Barron.

Dickson, N. A., Almena, R. 1.
Dermansky, Barron.
Dennison, H. H., Barron.
DeWolfe, Arthur, Barron.
DeWolfe, Harry, Barron, R. 1.

Evenson, John, Barron, R. 1.
Ellsworth, H. G., Barron.
Erickson, John, Barron.
Ellis, W. H., Barron.

Floan, T. O., Rice Lake, R. 4.
Faurat, Isaac, Rice Lake, R. 2.
Fuller, J. F., Barron.
Ferris, John, Barron.
Frey, H. A., Barronette.

Gulickson, Andrew, Barron.
Grilley, D. S., Barron.
Greeno, J. R., Barron, R. 2.
Goheen, Chas., Barron.
Glover, A. J., Ft. Atkinson.
Greeno, G. R., Barron, R. F. D.
Grover, Wood, Ridgeland.
Gould, J. F., Clayton, R. 2.
Gillett, Frank, Barron, R. 4.
Gleiter, G. J., Barron.

Hinze, Gust, Barron, R. 4.
Howard, M. C., Cameron.
Hart, R. B., Cumberland.
Hunt, W. C., Barron.

MEMBERSHIP, 1909—Continued.

Heffner, C., Barron.
Horning, Wm., Cumberland.
Horstmann, F. Almena.
Hess, F. W., Menomonie.
Hill. C. L., Rosendale.
Hoxie, Fred W., Hillsdale.
Hover, H. J., Barron.
Hegtwedt, Chetek, R. 4.
Hansen, A. Fred, Clayton, R. 2.
Heldstad, C. O., Rice Lake.
Halvorson, Albert, Rice Lake, R. 5.
Herring, E. W. Barron.
Hazelberg, T. T., Rice Lake, R. 1.
Honda, A. A., Prairie Farm, R. 1.
Hagen, John, Turtle Lake.
Hill, F. E., Paskin.
Hooda, O. E., Prairie Farm, R. 1.

Johnson, J. H., Barron.
Johnson, Ole, Arland.
Jacobs, E. C., Elk Mound.
Johnson, Sherman, Barron, R. 1.
Johnson, Thure, Barron, R. 1.
Jure, Henry, Barron.
Jacobson, H. P., Barron.
Johnson, Bennie, Cumberland.
Johnson, A. W., Barron, R. 2.
James, W. D., Ft. Atkinson,

Kolb, C., Barron.
Krahanbuhl, F. J., Barron.
Kohten, Jacob, Barron, R. 1.
Klein, O. G., Barron.
Kulowatz, Christ, Clayton, C. 2.
Kline, D. Rollin, Cumberland, R. 1.
Krippner, W. F., Barron, R. 3.

Lawton, C. S., Barron.
La June, John, Rice Lake, Wis.
Lund, A., Augusta.
Lentz, E., Barron.
Lamb, E. L., Barron, R. 1.
Lehmann, Paul, Barron.
Lund, Samuel, Black River Falls.
Lake, Wm., Barron, R. 3.

Michalson, H. C., Turtle Lake.
Mossey, A. B., Chetek.
Matthys, Peter B., Barron, R. 2.
Markes, G. W., Barron.
Morrison, Claude, Barron, Wis.
Martiny, L. P., Chippewa Falls.
Millard, Frank, Barron.
Melone, John, Paskin.

Miller, J., Barron.
Meadows, C. W., Barron.
Mero, A., Rice Lake, R. 4.
Mess, Chas., Cumberland, R. 6.
Moe, S., Dallas.
McKinny, E., Barron.
Myers, J. W., Barron.
McKee, Wm., Barron.
McGuam, J. P., Barron.

Nelson, Ernest, St. Croix Falls.
Nesbit, Lloyd, Barron.
Nelson, Archie, Barron.
Nelson, E., Barron.
Nason, H. E., Osceola.
Ness, Henry, Clayton.

Ol on, Albert, Prairie Farm.
Osterbrink, Ignatius, Barron.
Orn, C. J., Barron, R. 1.
Orm, C. J., Barron, R. 1.
Osborne, A. J., Barron.
Ora, H. T., Manawa.

Pieper, Wm., Cameron.
Post, Dr., Barron,
Post, George, Barron.
Porter, W. T., Barron.
Pierce, E. E., Barron.
Peck, Arthur W., Marshall.
Peterson, Ed., Cameron.
Peck, George, Marshall.
Peterson, Geo., Prairie Farm.
Post, Chas., Barron.
Post, John, Barron.
Palmer, L., Barron.

Roe, O., Cameron.
Rosenquist, A. M., Ladysmith.
Rockman, Julius, Barron.
Romanosky & Horstman, Barron.
Reese, Robt., Cameron, R. 1.
Roemhild, Frank, Prairie Farm.
Rockman, Ed., Barron.
Rather, W. F., Pebbles.
Radermacher, H., Barron.

Stebbins, Arthur, Barron.
Stowe, W., Barron.
Sumpter, A., Barron.
Sletten, Chas., Chetek.
Scribner, R. M., Rosendale.
Strong, C. N., Chetek.

MEMBERSHIP, 1909—Continued.

Scribner, C. H., Rosendale.
Searles, H. C., Fond du Lac.
Saastad, P., Cameron.
Snodgrass, Geo., Barron.
Sather, L. K., Barron.
Sullivan, Wm., Barron.
Stenerson, Tom, Barron.
Smith, Ed. E., Barron.
Spencer, Milton, Barron.
Severson, J., Barron.
Swetland, H. C., Cameron.

Taylor, J. W., Barron.
Thomas, Dell, Barron.
Taylor, C S., Barron.
Taylor, C. A., Barron.
Thompson, K. E., Barron.

Vol, Louis, Barron.

Wagonback, P., Barron.
Washburn, Steve, Barron.
Wygant, H. O., Barron.
Waukesha Canning Co., Barron.
Westram, C. A., Barron.
Welles, M. L. Rosendale.
Wickern, J. F., Barron.
West, Ray N., Ripon.

York, Arthur, Barron.

TRANSACTIONS

WITH

ACCOMPANYING PAPERS AND DISCUSSIONS

OF THE

Wisconsin Dairymen's Association

AT THEIR

THIRTY-SEVENTH ANNUAL CONVENTION

Held in Barron, Wis., February 10–12, 1909.

President F. H. Scribner in the chair.

The Chairman: The convention will please be in order. The first thing I notice on our program is the Address of Welcome by Mayor Atwater.

ADDRESS OF WELCOME.

Mayor J. T. ATWATER, Barron, Wis.

Mr. President, Members of the State Dairymen's Association: Our little city of Barron surely welcomes you to meet in your Thirty-seventh Annual Convention. Not only does our city welcome you, but the county, and I might say, the whole northern part of the State.

When Mr. Ellsworth, Mr. Bowen and myself were with you last year and asked you to meet with us here this year, we told

you a great many things and promised you quite a number. Among other things we told you that we had plenty of hotel accommodations, and we did have at that time. Last fall a fire visited us, burned up a great many of our business places, and among them, a large forty-room hotel.

At that time we told you we had fine dairy herds managed by good dairymen who had herds of nice graded cows, and above all that we had the soil that produces the best dairy feed known in the United States, and it is improving each year. We are cleaning up more land for pasture, tilling the soil in connection with our dairying, so that this country has improved wonderfully in the last few years.

Our little city is a farmers' town, and I might say, a dry town too. Most mayors at meetings like this, gentlemen, tell you that they have thrown away the key, during a few days' stay here. But we don't have to have a key; we have no day policemen at all, and our night policeman goes on duty late and comes off early in the morning, and we can all feel perfectly safe. We have very few objectionable citizens in town; we have only one game warden and one oil inspector.

Aside from our fine dairy country to help keep up our town we have a few little industries here which you do not find in some of the southern towns of this size. We have a fine woolen mill, owned by C. S. Taylor, which turns out anything from a Mackinaw jacket to a piece of fine woolen cloth, and by the way, I believe he was the first man to bring in a full blooded animal of the dairy type.

We have also a large flour mill, owned by Jerry Taylor, but the Taylors don't own the whole town. We have a large canning factory here that cans a product from 1,500 to 1,800 acres a year, mostly peas. We have a large stave and heading mill; we have a fine brickyard, undergoing repair this year to the extent of several thousand dollars; good concrete works, putting up concrete silos, water tanks for the farmers, and all such work. We have sawmills and several other little industries like that. We have tobacco sorting houses here in town, and last, but not least, our creamery, and I wish that I could have put into carefully written shape what I have to say to you about our creamery. We have seen it grow in the last few years, and we are proud of it, as proud as of anything connected with Barron.

I do not know what more I could say to you, but after you have finished your three days' work here with our farmers, we will feel like saying to you the same as the old German who kept a store. After his customer had gotten through and was ready to leave, he always looked up and said, "Come in again."

RESPONSE TO ADDRESS OF WELCOME.

Mr. Goodrich: Mr. Chairman, Mr. Mayor, Citizens of Barron county: In behalf of the Dairymen's Association, I am glad I am here, as the old man used to say in meeting, "I think it is good for I to be here." That is the way I feel. And it is because we are sure of our welcome that makes us feel that way. I tell you I have been in places where I was not welcome, as you may judge by this button I wear, and I came to the conclusion I didn't like to be where I wasn't welcome.

We have met together to talk over a business that I believe is the best business that a farmer can engage in, and that is dairying. I know that the people of Barron county are much interested in this business, and we have met here together to talk over the things we are interested in. The truth is, no one man knows it all on any subject, and no one man knows so much but there is somebody else who knows something that he doesn't know, and, on the other hand, there is no man knows so little but that he knows something that some of the others do not know, and if we can only get together, we will all of us know a great deal more when we go home than we did this morning, and that is what we are here for. Thank you.

The Chairman: I have been interested in this dairy work for a great many years, it has been my life's work, and while, as I look back, I do not feel as though I had done all I could do, yet I realize that I have accomplished a great deal along these lines, and that it has only been done by hard, persistent work and thought. These things do not come by happen-stance, but by good, hard work. If a man is successful, it is because he has done something. We have to be busy, we have to think about our problems, our great questions all the way through,

and it is quite as important for the dairyman to fit himself as to get the work out of his cows.

I will suggest the names of the following gentlemen to act on the committees:

Auditing Committee: C. H. Everett, H. G. Ellsworth and J. E. Bowen.

Nominating Committee: C. P. Goodrich, A. J. Glover and M. L. Welles.

Resolutions: J. T. Atwater, U. S. Baer and Ray N. West.

Recess to 1:30 P. M.

AFTERNOON SESSION.

The convention met at 1:30 P. M.
Mr. C. P. Goodrich called to the chair.

ANNUAL ADDRESS OF PRESIDENT.

F. H. Scribner, Rosendale.

No one realizes more than I, the importance of the position, that at your last meeting was given me, as president of this association. As each succeeding year brings us a little nearer the wonderful possibilities of that most wonderful machine, the "dairy cow," and the possibility of Wisconsin as the greatest dairy state in the Union, it is only by united effort on the part of the officers and members of this association, that the state can expect to hold the envious position it now occupies.

The year just closed has been a notable one as concerns all lines of the dairy industry. The importance of better and more economical feeds is fast being recognized by the fact that more silos are being constructed; and the rigid fight against the "scrub" which is being taken up on every hand, is fast putting the special purpose dairy cow, the economical producer of milk,

cream, butter and cheese, where she rightfully belongs. Progress has also been made in the crusade against unsanitary barns, and the education of the dairyman in the vital necessity of better ventilation and more sunlight to keep our cows in a more healthful condition, and to help eradicate that dread disease, tuberculosis, which very materially reduces the efficiency of a herd as a machine for producing milk from feed.

Sixty million dollars was the annual returns from all classes of dairy products last year in Wisconsin, and while we are patting ourselves on the back, as to our great achievement, it might be well to consider that this increase over previous years is not all due to an increase in the production, but is partly due to the high average price received. There are in this state 1,250,000 milch cows, which would make an average of $48 return per cow, and after deducting the cost of feed for the year, leaves an alarmingly small amount of profit. Did we ever stop to think that to double the returns per cow would triple the profits per cow. A 150-lb. cow, figuring cost of keep at $25 and butter at 30c, would leave a profit of $15, while a 300-lb. cow with cost of keep at $35, would leave a profit of $55. It is only over and above cost of keep that we are to realize any profit, yet many say they did not have to buy any feed, yet is it not true the feed is worth just as much whether bought or raised?

In the recent Live Stock meetings held at Madison, in nearly every discussion, no matter what kind of stock, we heard the expression, "The sire is half the herd," and in this expression lies the salvation of the Wisconsin dairyman who wishes to receive all the money he can out of the business. There must be a constant tendency of the herd toward improvement in butter yield, for like every other business, nothing is at a standstill; advance or decline is the rule, and this movement will all be governed by the brains that control the work on the farm. A scrub man will keep a scrub herd, while there is no holding down of the thoroughbred man. In a recent census taken of 20 herds, an average of 2,096 lbs. milk and 80 lbs. of butter fat per cow in one herd is conclusive evidence in favor of grading up with a pure bred sire.

Too many farmers keep cows just because they happen to have them around. They feed them expensive feeds year after year, and never give thought to the question of whether it pays or not. They are dairymen by accident. If they have any good

cows in the herd, it is by accident too. They work upon the theory that the cow is a machine, and treat her about like they do their farm machinery.

I have been unfortunate enough to be assessor in our town for several years, and one of the questions I have to ask is, how many pounds of butter did your cows make last year, and the answer comes, "Oh, I don't know. I got my check and spent the money and that is about all I know about it." Is it a wonder, then, that the average production is where it is, when such shiftless, halfhearted methods are used?

The present high prices for good grade stock, if for no other reason, ought to be an incentive to breed and raise better stock, while the markets will take and pay fair prices for anything that has hide and hair. Yet what really makes the good price on a dairy cow, is her ability to do something. A man on my farm, who could not work, or would not work, would be worth nothing.

Although our meeting this year is the farthest north of any in the history of the association, yet we find a zeal and enthusiasm along dairy lines that well may be coveted. Here we find one of the most modern and best equipped creameries in the state. We find three county breeders' associations, the Holstein, Guernsey and Jersey, and in this county more cows have been tested for tuberculosis than any other county in the state, and on account of the disposition of its people, and of its natural grass facilities for producing milk, Barron county will soon be looked to as one of the leading dairy counties.

Three years ago Yeksa Sunbeam carried off the honor of being the champion Guernsey cow of the world, giving 857 pounds fat. Two years ago, Colantha 4th's Johanna carried off the honors as the greatest officially tested cow in the world, with 998 pounds of fat, and now comes Jacoba Irene, a Jersey cow, who unquestionably is the champion long distance cow of the world, that gave last year 17,253 pounds milk and 954 pounds fat, or an equivalent to 1,122 pounds butter. In the two years previous she gave 31,505 pounds milk and 2,053 pounds butter and in the three years previous 42,064 pounds milk and 2,745 pounds butter, and besides this, has dropped her owner a healthy, living calf each year; this means an income of over $800 for butter alone in the past three years.

I wonder if most of us have stopped to consider that it is possible for us to double the income of our farms. The average dairyman thinks only of his income from the milk alone, while it is just as possible to realize just as much more through the sale of good high grades or full bloods. There never was a time in the history of our country when good high grades were in such demand as at the present time, and one ought not to hesitate a minute to purchase a good pure bred sire to head his herd, for there never will be an over production of cows of this character, and it is the object of this association to do all it can to encourage work along these lines.

The following clipping expresses my sentiments very nicely: "Cow milking farmers do not borrow money from bankers; they loan money to bankers and others, they live in elegant homes and don't swear. The supply of good butter, cheese, pure milk, cream and blooded stock has never equalled the demand, to say nothing of a better class of boys and girls, home grown, for husbands, wives and high grade of citizens."

In June five meetings were held in Northern Wisconsin, which I think were productive of as much good as anything this association is doing, barring the test association work, for it brought the work of cow improvement to a large number of people that might not be reached in any other way, and the interest manifested assures me that more of such meetings could be held very profitably and that the money of this association could not be expended to any better advantage.

President Scribner resumes the chair.

OPPORTUNITY FOR THE ENTERPRISING DAIRYMAN.

J. Q. EMERY, Dairy and Food Commissioner, Madison.

(Read by Mr. U. S. Baer in the necessary absence of Mr. Emery.)

In the office of the President of the United States there is posted, where it may be readily noticed, the following brief poem by the late Senator Ingalls, wherein he personifies

OPPORTUNITY.

"Master of human destinies am I!
Fame, love, and fortune on my footsteps wait.
Cities and fields I walk; I penetrate
Deserts and seas remote, and passing by
Hovel and mart and palace—soon or late
I knock unbidden once at every gate!"

"If sleeping, wake—if feasting, rise before
I turn away. It is the hour of fate,
And they who follow me reach every state
Mortals desire, and conquer every foe
Save death; but, those who doubt or hesitate
Condemned to failure, penury, and woe,
Seek me in vain and uselessly implore
I answer not, and I return no more!"

Let me briefly enumerate some of the requisite characteristics of the dairyman if he be enterprising.

First: He has integrity. The dairyman who does not build upon integrity may be likened unto the foolish man who built his house upon the sand, and when the rain descended and the floods came and the winds blew and beat upon that house it fell, because it was founded upon the sand; but the dairyman who builds upon integrity may be likened unto the wise man who built his house upon a rock and when the rains descended and the floods came and the winds blew and beat upon that house it fell not, for it was founded upon a rock.

Events which have occurred within the past year or two, in which men of national standing and reputation have gone down to ruin, emphasize the necessity of building not only our character but all our enterprises upon the solid rock of integrity. The integrity to which I refer must be broad enough to include intellectual integrity. The dairyman must be honest not only with his neighbors, his family and his herd, but he must be honest with his own intellect. I am fully persuaded that the lack of intellectual integrity is the cause of too many failures.

Second: If the dairyman is enterprising he uses intelligence. This applies alertness, the use of judgment and reason. It implies intellectual hospitality, the readiness and willingness to entertain new ideas and thoughts, to be a student, to be a learner.

Third: If the dairyman is enterprising he has the habit of industry, and he has method, accuracy and dispatch in doing work.

Fourth: The dairyman who is enterprising has the power of initiative and promptitude in beginning work. If the pig pen is situated beside the road near the house or barns where the odors do their harmful work to the family or to the dairy products, the enterprising dairyman has sufficient power of initiative to remove it to some more seemly place and to more suitably care for it when removed, though by so doing he runs counter to the long-established habits of his father.

Fifth: The dairyman if he is enterprising has the power of attention and perseverance. He must be able to center his thought and activity upon the essentials. He cannot fritter away his time over frivolous affairs nor can he allow himself to be distracted by the many conditions and circumstances that may tempt him by their solicitations. Having determined upon the necessary course to be pursued, he must persevere in that course and overcome all obstacles.

Sixth: And he must have courage in the presence of difficulties which are sure to confront him. These difficulties will test his integrity, his use of intelligence, his industry, and his power of attention and perseverance, and he must have the courage to meet successfully all these difficulties.

Seventh: The enterprising dairyman must have self control and self denial. My conception of self denial is simply the power of subordinating a poorer judgment to a better judgment.

Eighth: The enterprising dairyman is progressive. He uses his intelligence, his judgment, reason and other intellectual powers to acquaint himself with the progress in the dairy industry and to keep abreast of the times.

Ninth: The enterprising dairyman has common sense. The story of the Scotch Divine's charge to a young minister is applicable here. He said to him, My brother, if you lack piety you can get that through prayer, if you lack learning you can get that from the books, and so he went on enumerating one lack after another and pointed out how that lack could be supplied, and then closed by saying, But my brother, if you lack common sense, may the Lord have mercy on you.

To the young man who possesses these characteristics in some greater or less degree, or who at least has a tendency, an impulse toward these characteristics—a desire for them—dairying opens a splendid opportunity:

First: To make a good living. It is too much to say that in our present complex civilization any person can be entirely independent of others, but the dairyman may be relatively so and this is no unimportant matter. He can supply himself with pure food. He is not compelled to use the numerous adulterated food products which sordid and unscrupulous manufacturers and purveyors are seeking to palm-off upon the public. He may supply himself with fresh vegetables and fruits from his own farm, and likewise meats, also fresh dairy products, and he will have sufficient income to supply other needs.

Second: To establish and maintain a home. In doing this the opportunity is his of supplying himself, first, with the necessaries and following that with the conveniences and the comforts and the luxuries of life. Among these are books, music, education and some leisure.

Third: To conduct a modern farm. The young dairyman has the opportunity to construct, as the years go by, buildings suitable for his purposes and that are architecturally attractive. He may lay out his fields and give them tillage in such a way as to be a model. He may provide himself with orchards located and cultivated according to his own ideals that shall yield him a variety of luscious fruits, bountiful and timely. He may have around his home an attractive lawn and in all his operations display good workmanship because he prefers this to

slovenly or indifferent work, and if his heart is in this work it will be to him not drudgery but a constant source of pleasure.

Fourth: To develop and maintain a herd of high class dairy animals. This involves the use of intelligence and care in the selection, the breeding, the feeding, caring for and developing of the same. At first it may be that his herd will consist of grades which he is constantly improving by careful selection, breeding, feeding and care; but he will gradually develop a herd of pure breds. Being intelligent and progressive he will co-operate with his neighbors in like improvements. These buildings and fields and orchards and lawns and herds may be so provided and maintained that they shall be outwardly to his home like the pictures and the works of art that may ornament his home within.

Fifth: To co-operate with others in establishing co-operative creameries, cheese factories, etc., and establishing and maintaining such regulations in their management honestly and skilfully conducted, as to secure clean milk from clean, healthy cows, thus securing to the dairymen the profits of the industry as they well deserve.

Sixth: To be a cultured person, a useful citizen and a real artist. His fields may be laid out and cultivated in an artistic manner. His orchard may be artistic, so may his buildings. His herd of beautiful pure bred dairy cows that he has himself developed in the passing years may be veritable ornaments to his fields and pastures.

Seventh: To exercise inspiring leadership in the movement of people back to wholesome country life. There has been the great movement from the country to the city, but that movement is now beginning to reverse itself and an opportunity is offered the enterprising dairyman to so conduct all his farm operations, to so manage his herd, to so train his family to habits of industry, the love of music, of books and into the pleasure of the higher life, that his example may attract others into like undertakings.

DISCUSSION.

Mr. Goodrich: One of the good qualifications of a man is to pay his debts as he goes along. Down in the part of this State, where they have been dairying the longest, men are better able to pay than they are where they have been raising corn or doing any kind of business where their income is all in a lump, because they spend it before they get it, and they spend more than they ever get, and they get into debt. They are soon known to be not good pay, and I for my part don't think much of a man that isn't good enough to pay his debts. I don't suppose this hits anybody here, of course, but if it does, all right.

Now, a dairyman receives his income all the year around, every week or two it is coming in; in some rare instances, maybe a month, so he can wait until he gets his money before he spends it, and that is what the young man does that starts in dairying. He gets in the habit of paying for everything, and not spending his money before he gets it. When he gets it, he takes his check to the bank, and he doesn't need to use quite all of it. He draws what he needs and leaves the rest and so he starts a bank account. Now, I tell you a bank account is a beautiful thing to have, and when a man starts in and begins to have a little accumulation in the bank, he hates to see it all drawn out. I went to Mr. L. B. Caswell, a banker at Fort Atkinson, who was our congressman for fourteen years, and I asked him what class of men had the most deposits. Of course, I didn't ask him what deposits, that wouldn't have been a nice question. Well, he says, "We have over $100,000 deposited in our bank and mostly by farmers." I said, "What kind of farmers?" Now, of course, I wanted to know for a purpose, and was disappointed at his answer. He said, "I hadn't thought particularly about that, I will look it up and tell you the next time you call in." So I called in later, and asked him, "Have you looked that thing up?" and he says, "Yes, and I am astonished at the fact that it is almost all deposited by dairymen and they keep a balance to their credit right along, and to tell you the truth, I don't understand it." Of course I tried to explain to him how it came about.

Then there is another thing about dairying which has a tendency to make a man better otherwise. He has to be honest, honest at heart, or else he won't be honest with his cows and deal with them fairly. He has to be generous, because he must be generous in feeding his cows. He has to be a kind hearted man, he has to love his cows, keep down his temper and talk mildly, even if he doesn't feel mild, and he will get in such a habit of being kind and good to his cows, that first thing you know, it begins to have an effect upon his family and he is good to his family; he actually loves them.

The Chairman: I think there is one thought along the line of opportunity for the enterprising dairyman and that is the co-operation with his neighbor. It is so easy to run down what your neighbor says; to run down your neighbor's cattle, possibly because you don't happen to have the same kind of cattle that he does; and every time one does anything of that kind it hurts his own business; it hurts his own character. If a man isn't doing as he ought to, or we think so at least, let us go to him in a kindly way and see if we can't induce him by kindly words to do a little differently. It seems to me that would have a better effect than to pull and haul at one another.

Mr. Lillie: Mr. President, there is one thing that I feel like criticising in this paper, and that is the idea of quoting that epigram written by Senator Ingalls on "Opportunity." It carries the idea that there is only one chance for a man. If you take it then, all is well; if you miss that opportunity, all chance has passed by. I don't believe that. I believe there are opportunities that come up every day and every week of our lives; I believe we can even make opportunities for ourselves, and so, while in a measure, Senator Ingalls was right, yet I do not believe that ought to be the motto of the dairyman, because he is not passed by if he misses this particular opportunity.

The Chairman: We are now to hear what the Michigan Cow Testing Associations have been doing and from a man who has helped to form these associations.

We have asked Mr. Colon C. Lillie to come and talk to us about their testing associations, which have been wonderfully successful, and I am very glad to introduce to you Mr. Lillie from Coopersville, Michigan.

WHAT THE MICHIGAN COW TESTING ASSOCIATIONS CAN AND ARE DOING FOR MICHIGAN DAIRYMEN.

COLON C. LILLIE, Assistant Food and Dairy Commissioner, Michigan.

Mr. President, Members of the Wisconsin Dairymen's Association, Ladies and Gentlemen: I want to first assure you that I am very glad indeed of the opportunity of being here this afternoon. I am always glad of the opportunity to talk with dairy farmers about practical dairy questions.

First, I am glad to be here as a representative dairy farmer, one who owns and operates a dairy farm, and is interested in the question from a practical standpoint.

Then again, I am glad to be here as a member of the Michigan State Dairy and Food Department, which is trying to do something to uplift the dairy industry in our State.

Michigan is not noted as a dairy state like the state of Wisconsin which is known all over the country as a great dairy state. In many portions of it, you have intensive dairying, but in the state of Michigan we are young in this business. Of course there are a number of reasons for it; in the first place, Michigan is too good a state to be entirely a dairy state. You know, just across Lake Michigan we have what is known as the fruit belt of Michigan; considered from the fruit growers' standpoint, it is almost the most wonderful strip of land in the world. I never realized what an important strip of land it was until I went to the state of Florida one time among the orange growers. When they learned that I came from the Grand Rapids, Michigan, fruit country, they began to ask me innumerable questions about the fruit belt of Michigan, and so I found, when I got away from home, that Michigan was noted for something. That strip over there is protected, owing to the prevailing west winds and the water of Lake Michigan, in such a manner that it is the safest place to grow peaches in the United States.

I looked over the ground pretty thoroughly in Florida; saw a lot of orange groves, and you couldn't help but admire them.

They told some pretty big stories about their income from them, and then they asked me if there was anything in the fruit belt of Michigan that would compare with them. It was just after we had had a "bumper" crop there, and Roland Morrill had raised on his own farm and harvested $40,000 worth of peaches. I was proud that I had a story to match theirs.

Michigan is noted for one phase of improvement in dairying, although it is not a dairy state, and that is the co-operative cow testing associations. Our State Dairy and Food Department became very much interested in this idea of the co-operation of farmers for the purpose of testing their cows, finding out the profitableness, if you please, of each cow in the herd. It was not original with our department; we were very fortunate indeed in having as an inspector of our department a young man who was born and brought up on a Danish dairy farm, a Dane who had taken part in a Danish Control or Co-operative Association in Denmark, and who knew all about it. He had practical experience, and created enthusiasm in the rest of the department in this line of work. It is owing to him that the Michigan Dairy and Food Department received the enthusiasm sufficient to organize co-operative cow testing associations. Michigan organized the first co-operative cow testing association, not only in Michigan, but in the United States of America, the first one on this side of the Atlantic Ocean, and I have in my hand the record of this first Co-operative Cow Testing Association.

I know one time I attended a dairy meeting in my own county in Michigan and was talking about this subject somewhat as I am now, and I asked those in the audience to raise their hands, who owned Babcock testers, and there were three men in the audience who raised their hands. I said, "That is very good; I didn't expect that there would be three men in the audience that owned Babcock testers. Now, I would like to know how many of you are using those testers?" and there didn't a hand come up. There was an old Dutch farmer on the front seat, and I asked him, "Where is your tester?" He said, "Up in the garret." I asked, "Why is it up there, why don't you use it?" and he said, "Well, now, I'll tell you about it. The boy went down to Lansing and took the short course in dairying and he got enthusiastic about finding out what kind of cows we had and

when he came home he got me to buy a tester and scales, and we weighed the milk and tested it for two or three months, but it came summer time and the work increased on the farm. We kept putting it off, because we didn't have time to do it, just that day, and finally we got so we didn't do it at all. The tester was in the way and one day I told the hired man to put it up in the garret."

Now, that is just the way it works on the average farm, and for this reason the Co-operative Cow Testing Association is practical. You won't do it yourself and you ought to do it, because it places dairying on a business basis. As long as you won't do it yourself, the thing to do is to get your neighbors to co-operate with you so you can hire a man to go from farm to farm who will have nothing to do but attend to this business, and it will be tended to. That is where the Co-operative Cow Testing Association comes in. The man comes to the farm; he sees the cows milked and fed; he weighs the feed and charges it up at the market price. Of course he weighs the milk, and then he tests it to get the butter fat, giving each cow in the herd credit for the butter fat in her milk at the market price and charges up to her her ration at the market price, and after he has completed his work the farmer hitches up and takes him to the next farm, and he goes on in this way. At the end of the twelve months, he gets out a statement like this one (referring to a bulletin of Michigan Dairy and Food Department) showing the standing of each cow in each herd so that the farmer can see approximately how much it has cost him to keep every cow in the herd and how much the cow has yielded in milk or in butter fat. That puts dairying on a business basis. No man who keeps cows can afford to do without a cow testing association, and it costs but little.

The first great question that this system of work is settling for dairymen in Michigan is to prove to the average farmer that it pays him better to feed the crops which he grows on his farm to his cows, than it does to sell them off from the farm. It seems to me that this is the greatest benefit that these associations are doing to the dairymen in the state of Michigan. I believe that there are lots of farmers who keep cows and raise crops and buy some of the feed for them who would tell you that they honestly believe that if they sold their crops in

the market and got cash, they would get more out of their crops than if fed to cows.

Now, another reason why a man will do this is because he knows from actual experience and observation that when he grows crops upon his farm and takes out the nitrogen, phosphoric acid and potash stored up there, and then sells the crops from the farm, that he is depleting the soil of its available plant food. He is lessening its power of crop production, and it only takes about a generation before it reaches the stage where it will not produce profitable crops. A wise man looks at it in this way: If I raise these crops, and sell them off my farm, eventually I won't be able to raise profitable crops. So he is willing to work for almost nothing so far as labor is concerned, in dairying, to first turn those crops into cash through the dairy cow and get his money out of dairy production and husbands his soil fertility.

I asked a man in Grand Rapids, Mich., one time if he thought it was a profitable investment to buy bank stock if he had a little money that he wanted to invest. He says, "You won't get very big interest on bank stock, but it is mighty convenient to own a little bank stock, because if you want to borrow money, you can borrow it without any question." You see there was a business man that had his money invested in something simply because he found it convenient if he wanted to use it for the basis of a loan.

Cow testing associations are proving to the dairyman that he cannot get more out of his crops by selling them in the open market for cash than he can if he runs them through cows. This bulletin shows that in four cow testing associations, averaging about 300 cows, each association in different localities in the State of Michigan, that the owners on the average received $1.85 for every dollar's worth of feed which they fed their cows. And that certainly was not getting more for their hay, straw and grain by selling it off from the farm than to feed it to cows. If they had sold it off from the farm they would get a dollar but they could get $1.85 by feeding it to their cows.

In this Bulletin (referring again to a bulletin) it is shown that in the first co-operative cow testing association, every member of that association, received $1.73 for every dollar's worth of feed. They charged the feed up to their cows at

market price, just what they could get for the feed if they had hauled it from their farm and sold it in the market. For instance, last year in our cow testing association at Coopersville we charged our cows $7.00 a ton for clover hay. That is all we could have received for it if we had sold it off from the farm. We charged the cows $2.50 for corn silage and $3.00 a ton for corn stalks. I do not remember the other feeds, but they are all given in here. We charged them for cotton seed meal and oil meal and the other feeds we bought, exactly what we paid for them, and by doing that, we got $1.85 for a dollar's worth of feed.

Now, in the next place, these co-operative cow testing associations have shown us all that there is a great difference in cows. Many people would not believe it before; individuals knew it, but the average man would not believe that there is the difference in cows that look so much alike, stand in the same stable and are fed practically the same ration. Too many men figure that all cows are of the same value.

I heard a farmer say once that he would not pay over $35 for any cow, that was the limit. That man has not a very good idea of the value of a dairy cow, but I tell you when you pay $35 for some dairy cows, you are paying too much. A good dairy cow is worth from $150 to $250 more than a poor one which may be worth no more than $35 and even less, and the cow testing associations are proving it.

Suppose you have a cow which will not take the feed which you grow on your farm and manufacture it into milk, at a profit, how much is she worth as a dairy cow? Suppose you have another one standing right by the side of her, that will take the same feed and consume it and manufacture it into milk and make you a profit of $50. How much is she worth? Is she worth no more than thirty-five dollars, if she makes a profit in one year of $50? You look over those records, and you will find that there are a number of instances like that where one cow would not take the feed and manufacture it into milk at a profit; she would give the farmer perhaps 75 cents for a dollar's worth of feed. Another cow standing right by the side of her would give the farmer $2.00 for a dollar's worth of feed, or even $3.00.

That is one of the things that the cow testing association

is showing us, and when you know those things, how can you stop keeping records; how can you fail to keep on testing your cows and finding out? What is the sense of a farmer keeping a cow in his herd that won't take the feed which he gives her and manufacture it into milk at a profit? The cow testing associations have proved conclusively that we cannot pick out profitable cows by their looks; we used to think we could.

I know one time Professor Smith came out to my farm and we went down in the back pasture to look over a bunch of heifers, and I asked him to pick out the best one. He shook his head, and said, "No, I can't do it. Two or three years ago I thought I could, but I don't know as much about cows now as I thought I did then."

Why should you expect to pick out a profitable cow by her looks? Talk about common sense, you know that you can't tell a profitable horse by his looks; there is a heap of difference. You know that you can't tell by the looks of a man whether he is worth a cent or not.

The Chairman: Present company excepted.

Mr. Lillie: No, we don't except anybody on that score at all, and if you ever pick out a woman by her looks, you will get mightily fooled.

Now, why should we expect that we could pick out dairy cows by their looks? You know one man won't buy a dairy cow unless the bone in her tail reaches below the hock joints; another one won't buy unless the cow has crumpled horns; another one must be of such color; another of such a shape, and all those kind of things. Those are all good things to think about, and they may be indicative of dairy qualities, but, my friends, the only way to know a profitable cow is to put her to the test; feed her, keep track of what she did for you; count the cost and make a balance at the end of the year.

Another thing that these cow testing associations are teaching us is, that you cannot depend on a seven-day or thirty-day test; it doesn't amount to but mighty little. You have to keep a cow a year, you want to know how much she will give in a year, not in seven days, because we must feed her a year; and we have been mightily deceived in buying stock for breeding purposes from cows that made wonderful seven-day tests. They were forced unduly by expert feeders, put into an abnormal

condition so as to yield an immense amount for a short time, and I say these testing associations are teaching us that we do not want to put any dependence on those things; we want to know what a cow will do for us in one year, in two years, in three years, and that means that we will know something about the quality of that dairy cow under sensible, ordinary, liberal feed and management. We want to feed them to their capacity, but we do not want to feed so that we will injure them; we want to feed them up to their normal limit and keep them there, and then figure out how much they have cost for that year, and how much they have returned to us, and that will tell the whole story of that dairy cow. When you begin to figure along those lines you don't care whether she has a black and white or a lemon-fawn coat or what color she is. You are after the cow that will make you the most profit.

You will find out when you get into the dairy business on a business basis that it is not always the cow that yields the largest mess of milk in the year that gives you the most profit, and you are not particularly interested in having a wonderful yield of milk unless it is done at a profit. A good business man does not figure on doing a wonderful business and making nothing out of it; he would rather do a small business and have a profit.

Do you know, the most valuable lesson I got at the Michigan Agricultural College came about accidentally one day in the class. It was not taught in the text books or in the lecture room, but good old Dr. Beal was hearing our class in landscape gardening, and he was arguing that if we were ever to become landscape gardeners we had to study the proposition so thoroughly that we could see in our own mind just how a certain piece of landscape was going to look after it was developed. You cannot put a tree here and a bunch of shrubbery over there and then afterwards see that it is wrong and take it out and start afresh. In the course of his talk he turned to the class and said, "Young men, when you get back on your farms, it will pay you to take two days out of every week to study and think about your work." Think of the average farmer taking one-third of the actual time in reading, studying and thinking about his business. There wasn't a boy in that class but thought that a very extravagant statement, but the more I have learned about farming, the more I believe that Dr. Beal was right; that

one-third of the actual farmer's time—I do not mean a hired man's time, should be spent in studying his business. I mean the man who is the property owner, the man who has the investment. The farmer, in a way, is a capitalist and a laborer combined, and it is just as much his duty to make that capital earn him something as to make his bare hands earn something, and the more labor he can handle profitably on the farm, the more chance there is to make money off that farm. I mean the real farmer can well afford to work two-thirds of the time and think and study about his business the other third, and in ten years he will make more money than if he tries to put in all the time at hard work.

The cow testing association is the only basis of better breeding. What is the sense in raising a heifer calf out of a cow that has not the capacity to eat the feed which we raise, and turn it into a profit? How long will it take to improve a herd if you raise that kind of calves from that kind of cows? You will simply be going backward.

Somebody over here says, "What are you going to do with those worthless cows?" Another man asks, "Shall we sell them or give them to our neighbors?" N. P. Hull says, "Don't do that, that wouldn't be a Christian act." If you have a neighbor that is mean, a miserable ordinary cuss that you would like to get even with, don't sell them to him, but tell him he can have them if he will keep them five years. Make a contract with him, and then you can sit under the shade of a tree and see that fellow work and sweat and dig all summer to raise crops to feed those cows that will make him a loss, and you are pretty sure to get even with that man. If you can't do it that way, I don't know how you can. For my part, I would say make bologna sausage out of them.

Mr. Goodrich: You wouldn't say to feed them for beef, would you?

Mr. Lillie: No sir, I would sell them as quickly as I could; get a butcher to buy them.

Now, after you are rid of these poor cows, then you have your herd in shape to breed to a registered dairy sire; you have there the basis for improvement, and you can expect that improvement, because you will raise heifers that will be profitable producers, while, on the other hand, you cannot afford to run

the risk of breeding indiscriminately to a herd of cows that have never been even tested and you do not know those that are profitable producers and those that are not.

Mr. Everett: Why not breed to a grade sire, if there is one in the neighborhood that you can get for nothing?

Mr. Lillie: On the same principle that I cannot afford to breed to these cows before I know what they are. In the same way I don't know anything about this grade sire. You might get a grade sire that would be fairly prepotent and would bring you fairly good dairy heifers, but you would be more liable to get one that did not.

Mr. Everett: Did you ever know of a grade sire that really produced anything that was as good as he was himself?

Mr. Lillie: I ought not to express an opinion about that, because I have not paid any attention to grade sires for fifteen or twenty years.

Mr. Everett: Would you use one if you could get him for nothing?

Mr. Lillie: I would not. I would not run the risk. I would consider that would be going backwards instead of forwards.

The Chairman: Life is too short.

Mr. Lillie: Yes, indeed. One man over here asks what breed would you use in selecting a dairy sire? I am not here to tell you. I am simply here to call your attention to the fact that there are four or five breeds of cows that have been bred and selected for generations to consume large quantities of feed and to put that feed into the milk pail. There are special purpose dairy cows, and I advise you to choose some one of those breeds and use the one that you fancy most and you will make no mistake. I don't believe anybody could make a fairer or straighter statement.

So the man that will take a dual-purpose cow or beef cow and attempt to breed or select them expecting to get cows of dairy quality, is simply wasting a great portion of his life. You might just as well begin where somebody else left off and carry on the good work as to commence again clear down at the foot of the ladder.

A Member: How long would you let one of those cows go dry during the year?

Mr. Lillie: I believe that a cow ought to have a little va-

cation; it does them good. I think a good dairy cow should give milk about eleven months in the year and be entirely dry four weeks.

Now, the greatest benefit that we are getting out of these cow testing associations is this idea of co-operation that was brought up today. I tell you, if there is any one thing that the farmers of the United States need to do, it is to bring this spirit of co-operation into their business, to form co-operative business associations. That is what we want in every single neighborhood. We have got to learn that one single farmer alone is a mighty small business proposition; but when he is organized with all the farmers in his community, he is a proposition that can accomplish something. There is too much jealousy and that sort of thing among farmers; they are afraid that somebody else will do a little bit more business than they. I have seen people organize co-operative creameries in a community, put in their good money, elect president and secretary, and then sag right back in the breechings, praying all the while that the thing would be a failure simply because they were jealous. You can't do anything that way. We have got to learn, first of all, that if one farmer succeeds, all are going to succeed in that community. That is what makes the Danish farmer the most prosperous in the world, because he co-operates with his brothers, his neighbors.

A Member: Do these cows test differently at different times?

Mr. Lillie: Oh, yes, they vary. A cow will not always do her best; generally, if she makes a big record this year, next year she won't do quite so well, and the next year she will do better again. I wouldn't turn out a cow if she made a little profit, on one year's test. Of course, if she gave me fifty cents for a dollar's worth of feed, I would get rid of her as soon as I could get a butcher to take her; but if she gave me $1.25 for a dollar's worth of feed, or $1.10, I wouldn't turn her off until I had tried her another year. What we want is cows that will bring us $2.00 for every dollar's worth of feed and there are lots of them, and you can just as well have that kind as those that bring in $1.25. But the first test I made I wouldn't turn a cow off if she did fairly well; I would give her another chance.

The Kingdom of Denmark is about one-fourth the size of the State of Michigan. Michigan has now five co-operative testing associations, and the Kingdom of Denmark has 400; they

are in every neighborhood; they also have hen associations. The people all raise the same kind of hens so as to get uniform eggs, and they are all gathered and stamped so the consumer knows when the egg was laid, and after being gathered up they are taken to the Central Association and sorted over, put into different classes at different prices.

Why not let the farmer save the expense of the middleman that way, instead of having all sorts of commission men getting money out of it and selling them for somewhere about forty cents a dozen. The farmer isn't onto his job.

Then there is this question of community breeding. Mr. Goodrich was telling us in the noon hour how many thousands of dollars had been received for Holstein cattle which had been sold around Lake Mills in this state, and largely because all the farmers in that community raise one kind of cattle. When a buyer goes there he can pick up a carload easily; he hasn't got to come all the way up there and find one animal here and another one way over there. He can go to one little community and find his carload. We have localities over in Michigan where that thing is done, yet it has not been carried so far and so successfully as it has around Lake Mills. But that is what we want, co-operative business organization among the farmers. We have got to have it if we are going to make the greatest amount out of it.

There is another feature that we intend to incorporate into these co-operating testing associations, and that is sociability. At one meeting of our association, the members voted to hold monthly meetings at the farm homes of the members—and it strikes me that that can be made a very interesting and profitable feature—the different members of the association to meet at the farm where the testing has been done at that particular time and have lunch there. Have them take their wives along and enjoy it; look over the records there, talk this matter over, and have a little program. After luncheon call upon some of them to get up and talk about the different phases of this matter and their work upon dairying in general. I believe that we can make these meetings interesting and profitable and produce better feeling in our neighborhood. Meet often with a unity of purpose, and I believe that can be made one of the genuinely valuable features of co-operative testing associations.

I thank you very much for your attention.

DISCUSSION.

A Member: Do you think that the cow testing associations could be conducted successfully by the farmers weighing their milk once a month, bringing the samples to be tested at a central place?

Mr. Lillie: It could be done that way of course, but I don't think it would be as well. The greatest trouble I see in that practice is that every farmer, you know, has a great interest in seeing that his cow tests just a little bit better than the other fellows, and he will give her a little bit of advantage if he possibly can and not have his conscience stretched too much. Then again, it is necessary to get other details. It is just as important to know how much the cow eats as to know how much she is bringing in.

A Member: How often would you have your cows tested?

Mr. Lillie: The co-operative cow testing associations test once a month. It would be better of course to test oftener, but it is not practical.

A Member: Are two samples enough to give a fair test, one in the evening and one in the morning?

Mr. Lillie: Of course if he had more it would be better, but it is not practical to get more. The Danish Government has made careful estimates in their work on that, and they find that it is quite reliable.

A Member: What does a man cost you to do that kind of work?

Mr. Lillie: It costs from $300 to $350 a year, and his board and lodging. We figure on it costing the farmer a dollar per cow per year. If a man has ten cows, he pays $10, if he has twenty-five, he pays $25. If you don't have cows enough, it will cost $1.25 or $1.50, and it will be cheap at that. Mr. Rabild, the man I spoke of, has been picked up by the Dairy Division of the Department of Agriculture, and Chief Webster sent him to the Minnesota Experiment Station to investigate on this very point. Prof. Haecker has the records of the cows in that Experiment Station for sixteen years.

Mr. West: Would it make any material difference whether you would take the thirty days' milk or the one day's milk and multiply by the per cent of fat?

Mr. Lillie: No, how could it?

Mr. West: This man over here seems to think it might.

A Member: A cow might give thirty-five pounds of milk one day and twenty-five pounds another day.

The Chairman: You take it through the year and it will average up pretty well.

Mr. Goodrich: Before you get through the year one error will correct another pretty thoroughly.

I want to say that I think this cow testing association test will approximate pretty nearly right.

In 1901, they had the Pan-American Exposition at Buffalo. My son was employed there to test the cows every milking for the whole time, six months or more, and I have the records and I have spent a great deal of time studying over them. As I say, all milk was tested, so that they knew exactly what each cow produced. They can take any particular cow, the middle or the first of the month, or some day in every month right through, and figure it up from that and it varies very little. Some of them will come out exactly, and in this way we can know which are our best cows.

The Chairman: I would like to ask how many men in this room have the Babcock test. Put up your hands. Well, there are a lot of you; that is good.

Now, how many have got them up in the garret? Two. I see you have some honest people in Barron.

A Member: Mine is in the garret; we are not using it, but we are being tested through the testing association.

Mr. West: I think that in the discussion a while ago, the gentleman did not understand our Wisconsin conditions. The question was regarding the testing association where the farmers were saving their own samples and taking them to creameries. We have localities which will be strictly dairy localities in the future when the stumps have been grubbed out, and our lands able to support the herd on the land, and take good care of them, but at present, these localities are so situated that I do not think they could be handled practically under the plan of hiring a man to go around and do the testing. Therefore, our only chance to find out what our cows are doing is to form these associations where they send their samples to the creamery, and while it is true that some samples may be taken incorrectly,

I do not think that makes much difference. It doesn't do anybody any harm but the man that takes the sample. It can't do his neighbors any harm; he is getting no benefit out of it any more than the man who is taking his samples accurately, the way they should be taken, and I don't see why that method should be objected to. If a man wishes to cheat in that way, or any other way, he can do it under the other association practice.

Mr. Everett: The man simply cheats himself.

Mr. Lillie: I do not want my talk to be construed that I meant that that kind of an association is not of any value. The question that came to my mind was, that in my opinion they would not be as reliable as the other. I will admit that in some localities it would not be practical, probably, to organize cow testing associations because there would not be cows enough within a given radius, and that would make it cost too much, but I certainly think it is more reliable.

A Member: But the farmer is capable of weighing his own milk and taking a sample if he wants to be honest, isn't he?

Mr. Lillie: Oh, yes. There is a movement on foot in this country to register grade cows on performance. If we can have an association and go at that thing as it ought to be, it won't be but a little while before we will have a race of grade cows in this country that will be a little more valuable than pure breds, because they are on the registry on performance, not because they have royal blood in their veins. Now, we are going to have a class of cows that are registered cows, and registered because they do things, and then your kind of a record won't amount to anything.

Mr. West: I beg your pardon, I think it would. It may not amount to anything as far as the records go, but it gives a man a start.

Mr. Lillie: So far as this recording of cows on performance, those cows won't be considered at all.

Mr. West: These records, made the way they are, and the men who take their own samples and weigh their own milk, find out what their cows are producing.

Mr. Lillie: It is a mighty good thing, but don't compare it with the other system. Say it is a good thing and that is all there is of it.

Mr. Glover: I would like to ask Mr. Lillie what assurance he has that the man, who milked the cows the day before the tester arrived, to weigh and sample the milk in the system in vogue in Michigan, does it correctly?

Mr. Goodrich: Does the farmer know just what day the tester is coming?

Mr. Lillie: Not necessarily. He can go by the farmer's record of milk.

Mr. Goodrich: Suppose he doesn't have any.

Mr. Lillie: Then he has got two days, and if the cow doesn't give so much the next morning he knows something is not right.

Mr. Ellsworth: If the farmer is foolish enough to try to beat his neighbor, it seems to me he ought to get out of the business anyway. I have no criticism to make of the Michigan system of testing, and I believe the system spoken of by the other gentleman is all right.

My experience testing cows is limited. I commenced weighing every cow's milk two years ago in December and have done it every day since. I started by buying a lot of cows at an auction sale, and perhaps I got a larger number of good ones than if I went out and picked up one or two at one place; that is, before I got my tester. Then I sent my milk to the Barron creamery once a month and had it tested, and I got the butter-maker to tell me over the telephone what each cow tested, and the samples were all compared, and they tested from 2.9 to so high that I thought a job was put up on me, at least in one instance. I had one full blood Jersey cow. I was hunting after the poor cows, and we found that the larger part of them were too poor to keep, by testing; but I was so uncertain about this one cow that tested so high that I waited until some other cows freshened and took samples of their milk and samples of this cow's milk and I had them tested at another creamery, but I became satisfied I certainly had a good cow. I will say that the same cow was tested in this past year, and she hasn't done anywhere nearly as well. She ran down nearly two per cent, and I am sure I don't know the reason. Of course feed was not as good this last summer.

Mr. Everett: I think there is a lot of virtue in the argument of our friend over here, as well as in Mr. Lillie's argument. For instance, if it is impossible to form a test association in

this community, such as Mr. Lillie recommends, then the next best thing would be the one recommended by Mr. West. There may be some farmers in this community, though I must say you don't look like it, who would think it would be cute and cunning to send a dishonest statement to the creamery, a dishonest record of the milk. But he would only be cheating himself, and the buttermaker would be onto him quickly; he would certainly know that he was dishonest. That man would be branded in this community as a dishonest and unreliable man forever, and no man can afford such a reputation. Your buttermaker would also know the man that made the honest test and whether he or you had good cows, and he would very soon find out the one that was right and the one that was wrong from his books. No man is going to cheat himself; it would be no object to him to send a dishonest record of the milk from his cows.

There is only one thing really that gives a cow value and it is the fat she puts into her milk. If there is no fat in her milk, it isn't worth anything, except for pig feed; so you want to find out how much fat there is there. Test your cows some way; study out this question some way, and there is no better way than the Babcock test. There is no cheaper or more practical method for you to have the work done than through these testing associations for which you pay a dollar a cow to have your cows tested, and the official tester tells you at the end of the year what kind of a cow you have got and what kind of business you are doing.

Mr. Goodrich: He gives you a chart that you get from year to year and you can look back at it.

Mr. Everett: Another good point made is the amount of money that cows return to you for a dollar's worth of feed. If you can find that out, you are doing business like a business man. You know then whether you are making or losing money and only in that way can you become a successful dairyman.

The Chairman: I met one of my neighbor friends that I knew a good many years ago, and I was surprised to see that his right arm was gone. I asked him how he lost his arm, and he says, "Oh, I got it into a corn sheller, and away it went." I knew he was a dairyman and I said, "How do you get along with

all those cows?'' But he answered, ''Wife and the boys are milking and in fact I get along better than I ever did before, because I am using my head a little more.'' It isn't because we don't work hard enough, but we don't think enough.

I don't wonder sometimes that the boys want to leave the farm. On most farms there is no encouragement for the boys, but if a man has good stock the boys are more likely to become interested and then they will stay right there. Get good stock, raise them right, feed them right, breed them right, and you will get the boys interested. I don't blame our boys for going to the city where they can have their evenings and can go to a dance or a show if they want to, but when the farm work drags till nine and ten o'clock at night and somebody taps on the stove pipe at four o'clock in the morning, the farm boy doesn't care whether school keeps or not, and I don't blame him. Make the dairying a part of your farm work and you will have no trouble in interesting the boys.

Mr. West: I think there is one other phase in this work of co-operative testing associations that has not received enough attention, and that is the feeding question. Are these men that go around and are paid $300 and $350 capable of giving the farmers advice on feeding questions? Can he tell the farmer how to balance the ration of his cows so that he will get more out of them at the same or less expense?

Mr. Lillie: We have been fortunate in our work in getting old country people to do the testing, young men who have come over to this country and don't know our language very well and have had the practical work of cow testing associations in Denmark and in Norway. Those people are educated dairymen. They know how to balance a ration, know how to figure it out and that sort of thing. As soon as they learn how to talk, you can get a lot of information about feeding, based on their feeding in the old country. They can take the ration any dairyman is figuring and help him figure it out, tell him whether it is too narrow or too wide a ration. We are sending an inspector down to keep track of these men, and if there is any problem any of them don't understand, they can write to Friend Glover here of Hoard's Dairyman.

The Chairman: What does he know about a cow?

Mr. Lillie: Well, he thinks he knows a good deal, enough to answer questions.

Mr. West: No, we don't expect these men to go out and tell the farmers how to feed. But, for instance, I was in a barn the other night and the farmer said to me, "Do you think if I fed a little more oil meal and a little less silage, it would help my ration?" Now if a man had to take time to figure that out and tell him the next time, it wouldn't be much assistance to him.

Mr. Lillie: A young fellow that didn't know much could answer that question right off if he had any judgment at all and was brought up with dairy cows and saw the cows himself. He could give an opinion right off without very much figuring.

Mr. Glover: I have come to the side of Mr. West. I do not believe it is possible just at a moment's glance to tell whether a cow is getting too wide or too narrow a ration. The Experiment Station at Minnesota took years to find out that too wide a ration was injurious to cows. It seemed at one time during the experiment that it was not possible to feed a cow too wide a ration, and the cows did well on a very wide ration, but at the end of the third or fourth year, the animal was in a crippled condition. Moreover, at our own station it took them a long time to discover that salt was necessary. They took the salt entirely away from a certain group of cows and they seemed to do well without salt, but all at once the animals went to pieces figuratively speaking. It takes time to determine whether cows are being fed properly or not.

Mr. Lillie: The man who does the testing ought to know a great deal about scientific feeding, no question about that. He ought to know what is meant by a balanced ration and to figure it out, and take the ration that the practical farmer is feeding and see whether it is a balanced ration and be able to tell the farmer.

Mr. West: I had a man testing for me who was not able to figure out a balanced ration, I admit.

Mr. Lillie: That might be true when he first started out, but a good, bright young fellow in three or four months on that proposition would be familiar with it.

THURSDAY, FEBRUARY 11, 1909.

The convention met at 10 o'clock A. M.
President Scribner in the chair.

A LOCAL COW CENSUS.

L. S. CHENEY, Barron.

The Chairman: This has always been an interesting subject at every State Dairymen's Association, because it brings us in touch with what we are doing on our farms. There are a lot of us who are all right; our boys and our girls are all right, and we are all right, but when we come to put the test to our cows, they are not what they ought to be. I know sometimes we go to our state or county fairs and we think we are going to win out, but when we come into competition with others, we are not in it. It is a good thing to compare ourselves with our neighbors and see where we are at. We will now hear from Mr. Cheney.

Mr. Cheney: For something more than six weeks I have been collecting and studying facts concerning fifty herds of cows that are being kept in the neighborhood of our city to yield a revenue to their owners. The period covered in this investigation was the calendar year 1908, or the time beginning Jan. 1, 1908, and extending to Dec. 31, 1908. The greater portion of the information which I have obtained I present to you today in tabulated form upon the accompanying chart.

These herds yielded a cash return to their owners of a little more than $20,000 for the time mentioned above. In order to get at the cost of keeping these cows, the owners were visited and the matter was discussed thoroughly with them. None of them had an exact account in black and white of what they had fed to their cows, though a few had all the items on record except the roughage. However by getting their ideas of amounts of various feeds used, studying their methods of feeding; weighing sample feeds occasionally as found in the mangers ready

for the cattle and comparing my estimates with the amounts of the different feed items which the owners bought or raised, I have been enabled to reach estimates which, while not exact, I feel certain are not far from correct, since they were corroborated by the opinions of the herd owners and others acquainted with such matters.

I found among the different farmers a great difference in the amounts of different feeds used; some feeding heavily and others feeding barely enough to bring the animals through the winter in fair shape. I found also a considerable range of values attached to the different kinds of feed, by this I mean market values. Hay, for example, would range from $5 to $7 per ton for the same market grade and other feeds accordingly. In order to get at some practicable basis for figuring the cost of keep, I adopted a uniform price for each item of food as follows: Timothy hay per ton, $7; mixed hay, $6; clover hay, $5; millet hay, $4; corn fodder, $3; shredded corn stalks, $3; stover, $2; straw, $1; sugar beets, $4.50; other roots, $3; corn ensilage, $2.50; soiling crops, $2; pea ensilage, $1.60; oats, 40 cents per bushel; barley, 60 cents; corn, 65 cents; emmer or speltz, 60 cents; shorts, $23 per ton; middlings, $23 per ton; wheat bran, $22; buckwheat bran, $17; oil cake, $28. For pasture, I charged each cow $4.50 for the season.

Having found the cost of keeping the cow I went to the books of the local creamery, of which all of these farmers were patrons, and got there the number of pounds of butterfat sent in from each herd and the cash returns for the same for each month. In this manner I got the total amount of butterfat from the herd for the year, also the total amount of cash obtained for it. Then by dividing these totals by the number of cows in the herd I got the average for the herd in butterfat production and cash returns. As in all these cases, all the cream, excepting what was fed to calves and used at home, was sent to the creamery. The figures obtained from the creamery books show the entire cash returns from these herds.

As has already been stated the principal details of the cost of keeping the cow and the returns from her have been tabulated and may be seen on the chart before you. On this chart each herd is designated by number, following that in successive columns are the number of cows in each herd; the kind of cows;

the cost of feed in dollars and cents per cow; the cash returns from the creamery per cow; the pounds of butterfat per cow; the owner's estimate of what his cows would produce on an average in pounds of butterfat. In a few instances this was given in pounds of butter but as most were given in pounds of fat they were all reduced to the basis of butterfat. Following this is the average price per pound each received for the butterfat. It will be seen that this varies somewhat, depending upon whether the greater portion of the cream was produced in the summer when the price was low or in the winter when the price ranged higher. In the next column is found the value of the butterfat that one dollar's worth of feed produced and next to this is found the net profit or loss per cow in dollars and cents for the entire year. The numbers printed in red indicate that it cost that much more to keep the cow than she produced and the last column indicates whether butter was made at home or not; where a number occurs it means the number of pounds made. The blank spaces indicate that no butter was made.

That the facts stated upon this chart may become more intelligible, let us look a little closer into the records of a few individual herds. Let us begin with a couple that were not exactly paying propositions. In herd No. 13 there were six cows, one grade Jersey and five common stock. They were fed hay, straw and fodder, $18.50; grain and mill feed, $10.25; making $28.75 which with the pasture amounts to $33.25. These cows yielded their owner $18.12 worth of butterfat each in addition to milk and butter used at home leaving a deficit of $15.13. What is the matter with the cows? Let us look a little further. Each cow produced 75.4 lbs. butterfat which sold at an average price of 24 cents. That means midsummer fat when the price is lowest. This is not all. These cows are housed in a cold barn where it freezes every cold day and they get only cold water to drink. There may be something wrong with the cows but there is certainly something not just as it should be with the care they receive.

Now for No. 15. Here we find two grade Jerseys and three common stock. They were fed hay, straw and corn fodder, $18; grain, $5; and roots, beets, $7; making a total for feed of $30; add to this $4.50 for pasture and we have $34.50 as the cost of

keeping one of these cows for the year. In return she gave her owner 71.3 pounds of butterfat which sold at an average price of 26.3 cents, but this still left a balance of $15.63 on the wrong side of the ledger. We find upon examination that these cows have a cold barn and get their water from a spring out of doors in all kinds of weather. Neither this man nor the owner of herd No. 13 weighs or tests.

Now let us examine the record of herd No. 1. This is made up almost entirely of common stock, three of the cows having a little Jersey blood. There are twenty cows in all, producing 92.5 pounds of butterfat per head which sold at an average price of 25.7 cents per pound and cost 29.1 cents. The feed for these cows was ground oats $5; hay, $17.50; which with the pasture at $4.50 foots up to $27.

When the accounts are balanced we find a shortage of $2.70 per head. The owner of this herd does not spend money to buy farm papers or time to read them. His cows get their water from the creek that runs through his farm and on very cold days when they get into the barn they still have to fight the cold as it freezes in the barn at such times; in all weather, but the most severe, the cows are out. This man thinks it a good plan to have the cows on his wild woods pasture as they keep down the brush if the pasture is short.

Herd No. 47 is composed of ten Durham and Red Poll cows. The owner takes good care of his stock though he takes no farm papers. His cows are warmly housed; on all cold or stormy days go out only for water; he uses a tank heater to warm water for them and close attention is given to the feeding, the cows receiving hay as much as five times a day when in the barn all day. These cows were fed hay, straw and fodder, $14; ground grain (oats and barley), $10.50; bran, $4.62, which together with the pasture amounts to $33.62. They were well fed and got good care yet they only produced 121.1 pounds of butterfat per cow. This fat brought 27 cents per pound, that is, these cows were producing fat when it was worth almost the highest price, but in spite of all these points in favor of the cow, she still cost her owner 81 cents more than her butterfat amounted to. This man does not weigh or test.

Another herd similar in type to the one we have just considered is No. 37. This is composed of twelve head of Durhams,

either full bloods or grade, six of which are heifers with first calves. The owner of this herd is a painstaking, thoughtful man, who gives his cows good care, though he does not weigh and test. The cows are fairly well housed—it freezes a little in his barn in coldest weather. On mild days the cows are out three or four hours but whenever the weather is bad or the day cold, they are put back into the barn just as soon as they get their water. The water for these cattle is pumped into a tank which is inside a tank house. This tank house is heated so that the water goes to the cattle at a temperature of about 60 degrees. The feed was hay and straw, $14.50; soiling, 50 cents; shorts, $6; making, $21; which with the pasture brings the total up to $25.50. The cows returned their owner 104.2 pounds butterfat each, which brought him 25.3c per pound, yielding a net profit of 93 cents. One dollar's worth of this feed brought him about $1.03. This man feeding closer than No. 47 but giving his cows equally good care made a little the best showing, but as you will agree his profits are far from satisfactory. In these last two herds it would look as though the type of cow was at fault.

Herd 32 was made up of five Red Polls, three Shorthorns and six common or scrub stock, making fourteen in all. This owner has a good, warm, light and airy place for his cows; warms the water for them and does not allow them out in any cold or stormy weather excepting to get water. He fed hay, straw and fodder, $12.80; soiling, 79 cents; grain, oats and barley, $9.32; making in all $22.91, which after adding the pasture, $4.50, brings the total up to $27.41. In return for this the owner received 126.1 pounds of butterfat worth 26.3 cents per pound, which amounted to $33.21. After deducting the cost of feed and pasture the owner had left $5.80 as his profit per cow, or $1.21 worth of butterfat for $1.00 worth of feed. His net returns, you see, are still below the average. It will be noted that these cows are also mostly of the beef type. This owner realizes that he has been keeping the wrong kind of cows for profit and has already begun the breeding of purely dairy cows.

The cows of No. 44 were warmly housed in a dry, airy barn, turned out to warm water and allowed to go directly back into the barn again whenever the weather is cold or stormy. They receive hay, fodder and straw to the amount of $11; roots, 75

cents; grain, ground oats, $3.13, in all, $14.88. This with the pasture amounts to $19.38. These cows are fed cheaply and yet they are fed thoughtfully and judiciously for they return to the owner 116.1 pounds of fat which brought an average price of 26.7 cents per pound, a total of $31.10, netting the owner $11.72 per head; in other words, yielding $1.60 worth of fat for each dollar invested in feed and pasture. This man is a careful reader of good dairy and farm papers.

I desire to consider Nos. 9 and 49 together. They both show some remarkable results. No. 9 has seven head of common cattle which were fed $8.00 worth of hay, fodder and straw; $4.75 worth of mill feed and ground oats; roots, 65 cents; which with the pasture charge of $4.50 amounts to the remarkably low total of $17.90. From each of these cows the owner received 164 pounds of fat which brought the average price of 26.2 cents per pound, making a total return of $43.02. This man got his cows to make butterfat for him at 10.9 cents per pound. They made $1.00 worth of feed produce $2.40 in value of butterfat. To state it in another way, the cows netted him $25.12 per head. Herd No. 49 is made up of two common cows, mostly Shorthorn blood, and eight others with considerable Jersey or Holstein blood in them, ten in all. These cows received $10.50 worth of mixed hay, strong in clover; $1.25 worth of bran; $1.00 worth of roots each; making $12.75 for feed, which with the pasture makes a total of $17.25. Yet these cows produced 144.6 pounds of fat, worth 27.2 cents per pound, which brought him $39.41, a net profit of $22.16 per cow; $1.00 worth of feed yielded $2.28 in value. These two men evidently know how to make feed tell for the best returns. In both cases they have provided comfortable quarters for their animals and see to it that they are kept comfortable. No. 9 only allows his cows out on the pleasantest days, but he waters directly from the well. No. 49 warms the water for his cows, turns them out at noon to drink and puts them directly back into the barn every day. Both these men give close attention to the feeding and care of their cows, and while both have received splendid returns it is entirely probable that both could increase the net returns by heavier feeding.

No. 28 has a herd of eleven cows, one Jersey, two grade Jerseys, two grade Guernseys and six common stock with considerable Durham blood. He fed hay, straw and fodder, $10.27;

pea ensilage, $2.32; grain and mill feed, $3.27, which with pasture at $4.50 gives us a total of $20.36 per head. These cows gave in return for this 169.4 pounds of fat which brought an average price of 26.5 cents, a total of $44.99, making a net profit of $24.63 per head. The cow produced fat at a cost of 12 cents per pound or $2.21, for $1.00 worth of feed. This man though doing well is not satisfied with his surroundings. His barn is old and inconvenient, though very warm. He will have a new, up-to-date barn in a few months. He takes the best of care of his cows in every way. He reads the best farm and dairy papers and he is breeding only dairy cows and culling them to only such as yield a profit.

The last herd to which I desire to call especial attention is No. 38. The cost of feeding this herd was $36.17. This feed consisted of hay and straw, $6.60; corn ensilage, $7.50; stover, $5.00; soiling crop, $1.50; grain, mill feeds and oil cake, $15.85 (the oil cake was about $2), which with the pasture at $4.50 amounts to $36.17, considerable feed you may say to put through a cow. Right you are, but this man looks upon his cows as so many living machines that must be kept in perfect running order. From these machines he looks for profitable work. Let us look at his books and see whether he has been disappointed or not. These machines made on an average for him during the year 267.6 pounds of butterfat. This fat was produced at a season which brought the owner the highest average price paid to anyone on this list, namely, 27.6 cents per pound, or $73.99 per cow, producing a net profit of $36.72 per cow. While this butterfat costs more per pound than some other to produce, it still runs way below the average, the cost being 13.5 cents per pound. For every dollar's worth of feed, this man got $2.03 in butterfat value. One thing further, this man does not feel that he is being cheated out of something when he is feeding heavily. He figures this way. The more feed he can put through the animal and have its nutriment turned into butterfat at a profit, the more of the waste matter of his feeds he is putting into usable shape for returning to the farm as manure. How does this man secure his results? I do not pretend to be able to answer you positively, but I think I know of something about him that may have helped in securing these results. First, he is intensely interested in his work as a

dairyman, making the cows and their work his first concern. Second, he has in his house the very best dairy literature procurable and he reads and thinks about it. Third, he is constantly improving his herd of dairy cows by breeding and systematic testing and culling. Fourth, he has equipped himself with buildings suitable to make his cows just as comfortable in their quarters as he is in his. This means a thoroughly up-to-date barn with silo. And fifth, he manages his herd so that his cows produce the most butterfat when the price is highest.

To summarize: We have just 50 herds, the smallest had five cows while the largest had twenty. The total number of cows in all the herds is 553, making the average herd 10.6. The highest yield of butterfat per cow was 267.6 pounds, the lowest 45.9 pounds; the average per cow 139.5 pounds. The highest cost of keep per cow was $36.60, while the lowest was $17.25, with an average cost of $28.76. The highest cost per pound of fat was 54.4 cents, the lowest 10.9 cents. The highest butterfat value for $1 worth of feed was $2.40 and the lowest 45 cents, the average $1.35.

COST OF FEED AND INCOME OF FIFTY HERDS BELONGING TO PATRONS OF THE CREAMERY AT BARRON FOR THE YEAR 1908.

Herd No.	No. of cows.	Kind of Cows.	Cost of feed per cow.	Cash from creamery per cow.	Lbs. of butterfat per cow.	Owner's estimate of butterfat, cow.	Average price of butterfat.	Average cost of butterfat.	Value butterfat for $1 of feed.	Profit or loss (—) per cow.	Butter made at home and amount estimated.
1	20	Common, 3 with Jersey blood	$27.00	$24.30	92.5	100	25.7	29.1	$0.90	—$2.70	350 lbs.
2	10	Two with Jersey blood, rest with Durham	24.88	37.43	147.6	150	25.4	16.8	1.50	12.55	350 lbs.
3	18	Six Gr. Guernsey, 3 Gr. Jersey, 9 with Jersey blood.	26.98	37.65	238.3	200	27.2	19.5	1.39	10.67	225 lbs.
4	8	Basis of herd a full blood Holstein cow, offspring from common sire	32.74	42.64	156.1	225	27.3	21.0	1.30	9.90	None.
5	9	One Gr. Jersey, 1 Gr. Guernsey, 7 common	31.29	51.98	193.4	235	26.9	16.1	1.66	20.69	160 lbs.
6	11	Two Gr. Jersey, 1 Gr. Guernsey, 8 common	35.49	45.94	169.6	185	27.1	20.9	1.29	10.45	100 lbs.
7	13	One Jersey, 3 Gr. Jerseys, 3 Gr. Guernseys, 2 Shorthorns, 4 common with Jersey blood	36.59	58.24	215.2	200	27.1	17.0	1.59	21.65	275 lbs.
8	13	Common with Durham blood	21.73	35.49	130.5	160	27.2	16.6	1.63	13.76	110 lbs.
9	7	Common stock	17.90	43.02	164.0	150	26.2	10.9	2.40	25.12	None.
10	7	Common stock	25.00	11.21	45.9	100	24.4	54.4	.45	—13.79	300 lbs.
11	7	Common stock	27.23	28.77	116.3	150	24.7	23.4	1.05	1.54	300 lbs.
12	8	Common stock	23.50	23.51	94.8	150	24.8	24.7	1.00	.01	210 lbs.
13	6	One Gr. Jersey, 5 common	33.25	18.12	75.4	150	24.0	44.1	.54	—15.13	300 lbs.
14	12	Common stock with Durham and Jersey blood	21.90	27.13	99.8	100	27.2	21.9	1.23	5.23	None.
15	5	Two Gr. Jerseys, 3 common	34.50	18.87	71.3	100	26.3	48.2	.35	—15.63	200 lbs.
16	12	Two Gr. Jerseys, 10 common with Durham blood	23.90	35.39	136.5	220	25.9	17.4	1.48	11.49	260 lbs.
17	10	Common stock	29.95	47.20	175.4	200	26.9	17.0	1.56	17.25	None.
18	18	Two Gr. Jerseys, 16 common with Durham blood	27.75	27.47	107.4	150	25.6	25.8	.99	— .28	90 lbs.
19	8	Three Gr. Jerseys, 5 Gr. Shorthorns	29.68	32.20	120.1	250	26.8	24.3	1.10	2.92	260 lbs.
20	8	Seven Gr. Holstein, 1 common	24.50	43.74	164.4	100	26.6	14.9	1.78	19.24	None.
21	6	Various grades	20.30	25.77	102.7	185	25.1	19.7	1.27	5.47	185 lbs.
22	20	Three Gr. Jerseys, 4 with Holstein blood, 13 Durham.	33.92	47.54	176.1	175	26.9	19.2	1.40	13.62	None.
23	15	Gr. Durham	30.76	44.55	166.3	225	26.8	18.5	1.44	13.79	125 lbs.
24	8	One Gr. Red Poll, 2 Gr. Galloways, 2 with Jersey blood and 3 common	36.60	49.23	184.7	200	26.7	19.8	1.34	12.63	85 lbs.
25	13	Two Gr. Jerseys, 8 with some Jersey blood, 3 common	28.71	27.41	104.5	100	26.2	27.4	.95	— 1.30	310 lbs.

26	6	Common stock	33.53	30.41	116.3	—	26.1	28.8	.90	— 3.12	260 lbs.
27	7	Common stock	34.25	59.35	218.1	150	27.2	15.7	1.73	25.10	None.
28	11	One Jersey, 2 Gr. Jerseys, 2 Gr. Guernseys, 6 with Durham blood	20.36	44.99	169.4	200	26.5	12.0	2.21	24.63	None.
29	5	Common stock	20.02	31.86	120.2	125	26.5	16.6	1.59	11.84	None.
30	16	Common with Jersey blood	22.18	34.12	126.5	175	26.1	17.5	1.49	10.94	100 lbs.
31	8	Common with Shorthorn blood	20.50	27.94	110.7	125	25.2	18.5	1.36	7.44	160 lbs.
32	14	Five Red Poll, 3 Shorthorn, 6 common	27.41	33.21	123.1	225	26.3	21.7	1.21	5.80	100 lbs.
33	5	Common stock, 2 with Jersey blood	28.20	25.77	95.1	220	27.1	29.6	.91	— 2.43	110 lbs.
34	11	One Gr. Jersey, 2 with Jersey blood, 8 common	24.99	37.50	143.5	150	26.1	17.4	1.50	12.51	None.
35	13	Eleven Gr. Durham, 1 Gr. Guernsey, 1 Gr. Jersey	26.50	40.30	150.9	190	26.7	16.9	1.58	14.80	260 lbs.
36	11	One Holstein, 1 Gr. Durham, 9 common	25.00	31.41	115.8	150	27.1	21.6	1.25	6.41	210 lbs.
37	12	Three Durham, 9 Gr. Durham, (6 of herd heifers)	25.50	26.43	104.2	200	25.3	24.4	1.03	.93	160 lbs.
38	16	Eleven Gr. Jerseys, 6 common with some Jersey blood	36.17	73.99	267.6	290	27.6	13.5	2.03	37.72	None.
39	11	Common stock, 2 with Jersey blood	36.60	48.07	174.9	255	27.5	18.8	1.31	11.47	None.
40	10	Two high grade Jersey, 8 Durham with Jersey blood	32.60	54.95	207.1	—	26.5	15.7	1.68	12.35	None.
41	6	Two Gr. Jersey, 4 Gr. Durham	32.07	57.91	213.4	175	27.1	15.0	1.80	25.84	150 lbs.
42	12	One Gr. Guernsey —Jersey, 2 Gr. Jerseys, 9 common with Jersey blood	25.70	40 25	148.5	150	27.1	17.3	1.56	14.55	200 lbs.
43	8	Common stock, 2 with Jersey blood	22.50	22.56	90.6	125	24.9	24.8	1.00	.06	160 lbs.
44	10	Two Gr. Jerseys, 8 common with Durham blood	19.38	31.10	116.1	125	26.7	16.7	1.60	11.72	50 lbs.
45	7	Common stock with Red Poll blood	29.00	43.18	162.3	100	26.5	17.8	1.48	14.18	250 lbs.
46	17	Nine Gr. Jerseys, 5 with some Jersey blood, 3 common	26.40	39.73	148.4	200	26.7	17.7	1.50	13.33	365 lbs.
47	10	Durham and Red Poll	33.62	32.81	121.1	200	27.0	27.7	.97	— .81	235 lbs.
48	15	Common stock with some Jersey blood in most	29.40	32.39	121.9	—	26.5	24.1	1.10	2.99	None.
49	10	Two Shorthorn, rest with either Jersey or Holstein blood	17.25	39.41	144.6	175	27.2	11.9	2.28	22.16	150 lbs.
50	10	Common stock	33.20	36.29	130.6	—	27.8	25.4	1.09	3.09	None.
	10.6	Average	28.76	37.23	139.5		26.4	21.6—	1.35	9.16	
	533	Total cows									

DISCUSSION.

Mr. Cheney: No. 47 took exceptionally good care of his animals; he is especially interested in his cows. He knows his cows and takes good care of them and still he comes out 81 cents behind. It is possible that the breed may have had something to do with that.

Mr. Ellsworth: As between 37 and 47, when you add the butter made at home No. 47 has done better.

Mr. Cheney: I kept away from considering that intentionally. Of course, in many cases it will make a great deal of difference. For instance, it might well occur that one of these men made no butter whatever, and the other made some, and it would make a difference between the balance on the credit side instead of on the debit side.

The idea that I had in this paper was that the cows were kept for profit, but of course the cow is entitled to the profit that she makes, whether it is used at home or sold, and if you add that butter made at home, you should also add the cream and milk used at home.

In every instance, where you have the word "common," there are a number of cows that have a little dairy blood in them, less than half, so that I group them as "common." In cases where I have marked, for instance, "4 J," that is four Jerseys; these four Jerseys include full bloods and grades. The term "grade" means an animal that is half blood or more, whether the blood came from one side or the other, or whether it is a registered animal or not. This expression "4 Jerseys" includes full bloods and grades, and that is true all the way through. "J." stands for Jersey, "G." for Guernsey, "Gal." for Galloway, "R. P." for Red Poll, and "S. H." for Shorthorn.

Mr. Goodrich: I am very much interested in this work, because I believe it is capable of doing the dairymen a whole lot of good. I have taken a great interest in the dairy business, and whenever I can see returns from the work that amount to anything, it always makes me feel good.

I have taken a cow census for the Dairymen's Association on several occasions and at other times, and I want to tell you about a thing that happened to me that made me feel good. I

took a census down here at Rusk and it ran along like this one; some made money and some didn't. I fixed up a chart with big figures of a few of those that I wanted to call attention to, some of the extremes, and amongst the rest was one, that was No. 4. I am not going to tell you his name. He had made a loss, quite a loss, I think about $25 to the cow. He was a bright young man who had attended the Agricultural College and the Dairy School, but he had a farm of two hundred acres that he was badly in debt for that he just bought, and he thought he must just work awful hard, and he worked so hard with his hands that his brain was beclouded—it must have been. When I went there and saw his cows, why, you know he wouldn't stop to talk to me, he had so much work to do. I could see that his cows were not doing very well; they were running out in November in a real cold day, and trying to make a living out of the corn stalks that were there. Well, he didn't know whether he had made anything or not. He was capable of figuring it, but he hadn't taken the time; he had to work so hard he couldn't.

He was down to the convention, when this was discussed and after the meeting he came to me and he says, "Which was my number?" I says, "Can't you tell your number by the number of cows and so on?" "Well, no," he said. He had been looking the list all over and he couldn't. I had the list printed and handed around. I said to him, "Do you really want to know your number?" "Why, yes." I said, "I am afraid you will feel worse than you do now if I tell you." He says, "Well, I want to know." So I told him, "It is No. 4." He was looking right at that chart, and you ought to have seen the expression on his countenance. He says, "For God's sake, is that the kind of work I am doing? If I am going to do such work as that, I better throw the job now than to continue it any longer." Finally, he stopped a minute and he says, "I can do better; I will do better, and next year, when you come up in this part of the country, I want you to call on me and see if I haven't done better."

It was a year after that time I had a census for the Fond du Lac meeting, and I got a letter from him. He says, "You remember No. 4 on your chart last year. You know I promised to do better and here are my figures." He had made out all

the figures; he didn't have so many cows, had rejected some of the cows and instead of $27 returned per cow, he had $52.52, and that is what that cow census and that meeting had stirred him up to do, and I felt as though if under God I had been the means of converting one soul, I felt then just like the preacher would feel who had brought one soul from the error of his ways. I say that without disrespect to anybody; I tell you I did feel good. That is six years ago and I have felt good ever since.

Mr. Bartlett: I would like to ask Mr. Cheney what kind of feed No. 9 was fed?

Mr. Cheney: Eight dollars worth of hay fodder and straw; $4.75 for mill feed, ground oats, and 65 cents for roots; that is all the feed.

Mr. Martiny: What time of year did these cows freshen?

Mr. Cheney: I didn't ask any of these about the time of the year. I gathered the time of the largest flow from the creamery returns, when they got the highest price. He gets 26.2 cents so that his cows would be milking either in the fall months, or possibly the spring months, that is, the bulk of the milk flow.

Mr. Martiny: Could you give us any idea how many of those men had silos.

Mr. Cheney: Yes, I asked that question. I haven't it designated on the chart. I think there were seven men in this list who have silos, but most of those men have had the silos only for this fall. There are a good many more men than that who have silos in this neighborhood, but they don't happen to be on this list. I think No. 38 fed corn silage. No. 28 fed heavily of pea silage from the canning factory.

Mr. Ellsworth: You take No. 9; he sold $151.10 worth of feed for $420, making a profit on his feed of $279. No. 38 sold $655.20 worth for $1,183.84, making a profit of $528.64 which is $249.54 in excess of No. 9. That shows he was doing the best business, although he did not sell his feed at a higher price.

Mr. Cheney: I will say that practically nobody had weighed his hay, but I asked every man what he fed his cows in the way of hay. Generally he would say, "Oh, I don't know," "Well, did you give them ten pounds a day?" "I don't know." "Fifteen?" "I don't know, maybe." That is the way the answers would come, and then I would have to go at it another

way. I would ask him how much hay he had in his bay, and how many full grown animals he fed out of that bay, and I would figure the time and tell him how it came out; fifteen or twenty or ten pounds per day per cow, figuring all the stock he had and his hay mow. He generally knew somewhere near how much he put in, and we could get somewhere near it in that way, although I do not pretend to have been able to get the exact amount.

A Member: Isn't good corn fodder as good as hay for a cow, Mr. Bradley?

Mr. Bradley: Not alone. I prefer a mixture, and even at that there are only two tons of corn fodder to be fed at that price.

The Member: I have nineteen head of cattle. I had a lot of hay, and it lasted me over three weeks; then I had some straw and some fodder. I have fed about fifteen pounds a day.

Mr. Cheney: That wasn't enough to maintain them.

The Member: They have kept up pretty fair. They are always in good flesh, better than any around there.

Mr. Goodrich: We all know that a cow has to have something to eat, and we know that she wants not far from 3 per cent of her own weight in food, and if she doesn't get it in hay she may get it in something else, but if she doesn't get pretty near 3 per cent of her own weight, then she isn't going to produce anything and she is going to run down.

The Member: My cows have good pasture.

Mr. Everett: There is a disposition on the part of some of you, as I glean it from these discussions, to see how cheaply you can keep your cows. Now, No. 9 on that chart contains a valuable lesson for us all and so does No. 38. No. 9 fed $17.90 worth of feed and he got for a dollar's worth of feed $2.40; that is a very remarkable record. It would seem that No. 9 was trying to see how cheaply he could keep those cows, on how little feed, and yet he got the biggest returns of any one on the chart for a dollar's worth of feed. Had No. 9 been a good, liberal feeder, he might have received $3.00 for that dollar's worth of feed, but it is evident that he was not a liberal feeder. He has remarkably good common cows which were fed very cheaply.

Now, No. 38 is evidently a liberal good feeder, but something

is the matter with his cows; he fed $40 worth of feed to a cow and only got $1.80 worth of butterfat for a dollar's worth of feed.

Mr. Goodrich: You don't have to use her up. A cow fed well and correctly and liberally will last longer than one fed under a stingy diet.

The Chairman: That is right. I have had just a little experience of that kind. I remember we bought a reasonably young cow, but she had always been kept on marsh pasture and fed marsh hay, and she was very old looking, five years old she really was. We had one cow that had all she could eat every year since she was born, and she died at about eighteen, and she was really a younger looking cow at eighteen than the other at five. It is not economical feeding to be stingy feeders, to keep the feed away from your cows. Our business is to see how much we can get through those cows profitably.

A Member: I didn't mean to starve our cows. Years ago I used a lot of bran, but this winter I haven't used so much. I had only a few cows and bran was pretty high, but I had seventeen tons of hay and I know from the looks of my hay stack what they have had.

A Member: Is feeding a cow five times a day better than three?

Mr. Goodrich: I don't think it is. A cow really doesn't eat her hay and fodder until she has had time to lie down and eat it afterwards; she gets it into her paunch, and she hasn't eaten it any more than you have eaten apples when you have gone out into an orchard and put your apples into a bag and carried them home. She takes the substance in her receptacle for that purpose, and then she lies down and eats it. You don't want to keep at her all the time; give her time to eat between times.

Mr. Halverson: If you are feeding forty or forty-five pounds of ensilage a day, what would you feed to balance?

The Chairman: In the first place I wouldn't feed a cow forty-five pounds of ensilage, unless she was a great monster of a cow; I wouldn't feed over thirty pounds, and I would feed it twice a day after each milking, so as not to have it flavor the milk. Three times a day is all that I have ever fed cows and a great many good dairymen think that twice a day is sufficient.

Mr. Goodrich: When we sit down to a meal it doesn't all go down at once, we have it in courses, you know. Now, with the cow, the first course is hay, the next course, ground feed and the next course, silage; that is once a day, and then at night they have another course.

Mr. Glover: There is another side to this question of keeping good cows instead of poor ones that has not been touched upon. Two years ago Hoard's Dairyman made a cow census in Minnesota, and there were a thousand cows in that census. Upon calculation I found 136 cows from the best herds returned as much money as did the other 864. That set me to thinking a little further. I said to myself—If a man keeps 136 cows that are going to yield more than another 800, it will be cheaper. It will require less barn room, less land, less horses, and less men to milk them. So I went to figuring. With land at $60 an acre I found that a farm, large enough to care for 136 cows, and proper buildings to house the men, the cows, horses, etc., amounted to about $30,000, and on the other hand to take care of 864 it would take an investment of over $180,000, and that is a great difference, a big difference. This is what might be called an economic study in dairying. Of course you don't produce as much milk, but you are getting a great deal more out of it for each dollar's worth of feed that you put into your herd.

Mr. Atwater: Isn't it a fact, Mr. Cheney, that you know herds around here that are producing a great deal more than those that you have taken for your census? Does this include some of our best herds around here?

Mr. Cheney: Yes, it does.

Mr. Atwater: Then some of these fellows have been lying to me. When I sell real estate, I try to tell customers just what the farmers tell me, and after seeing that chart I don't want to meet some of the fellows I have talked to.

Mr. Everett: You needn't be ashamed of that record.

Mr. Martiny: Some of those things are off; the actual production and the estimated production do not correspond.

A Member: I wish you would read again the grain ration fed by No. 38 to his cows.

Mr. Cheney: Hay and straw, $6.60; corn silage, $7.50; stover, $5.00; then there was corn meal and other grain feed, $15.85; soiling crops, $1.50.

Mr. Goodrich: He fed heavily concentrated feed, and that is what makes the price so high.

Mr. Taylor: I am not dairying at present, and I am not fit to talk in the class with the President and Mr. Goodrich and others, but I want to say a word with respect to this chart. It strikes me that it is a most admirable presentation of this matter, the very best we have ever had in our county, and I am sure it will bring great results, it can't help but set people thinking; it even set Atwater thinking. There are two points that I am impressed with, the work and the result it will accomplish; and, secondly, it is to me an admirable illustration of the matter which was brought out under the discussion of this cow test yesterday.

Mr. Wells: Mr. President, I took the trouble last winter to go up to Athens and study their record and see how they fed their cows. I stayed there all day and watched every item about their feeding, and I noticed they fed their cows, it seemed to me, quite frequently. I was in the habit of feeding my cows four times a day. I gave them their ensilage in the morning, fed grain on the ensilage, and then I fed them hay at eleven o'clock, after they were watered and put back in the barn. Then I fed them their ensilage at four o'clock with grain on it. I gave them a little hay after they got through milking, but up there the first thing they do in the morning is to feed them grain, then milk them; then they have their ensilage, and then after a while a little hay. Then they fed grain and then milk and then they got fodder. I came home from there and I fed differently than I ever did before, because I wanted to find out if there was anything in feeding the way they did. I asked them why they didn't feed their grain right on the ensilage, but Mr. Reitbrock said that you wanted to feed things separately, because you don't know whether she is eating the ensilage to get the grain, or eating the meal to get the ensilage, and I have been doing that same way myself. The cows did drop off for a day or two, but then they came back and have been doing better than they ever did, and I am keeping on feeding that way.

A Member: Don't you think it is a little dangerous to feed grain all by itself?

The Chairman: We do not feed heavy grains. We have al-

ways fed our grain on our ensilage. The experiment was tried at our Experiment Station of feeding steers corn meal, and they found that they did not get any better results feeding clear corn meal than where the corn and the cobs were ground up together, making only half as much meal as in the other case. The ground cob loosens up the meal, so that the juices of the stomach come in contact with the feed and they get better results. I have always contended that where we put the feed right on the ensilage, it goes into the stomach in that loose condition, and the juices of the stomach can get at it a little better.

Mr. Martiny: Coming back to the chart, Mr. Goodrich says, supposing butter was 11 cents a pound, No. 9 would have made more money than No. 38. We don't want to suppose it at all; we want to take the facts just as they are, and in that case there is no question but what No. 38 did a great deal the best. He got $7.72 more out of one cow than the other man did. There are two ways of looking at that. No. 9 paid the most dollars and cents for a dollar's worth of feed, but No. 38's cows made the most profit; they actually did a great deal bigger business. We want to impress on the minds of these people that while No. 38 did not produce as many dollars and cents worth yet his cows produced a greater profit for the year. Now, coming back to the way No. 38 fed his cows. He has fed very liberally, about 30 pounds of ensilage per day, and during the year about a ton of hay, and a little soiling crops and figuring on 200 days' feeding, he fed something over 6 pounds of concentrates per day on this very high-priced feed. Now, the question in my mind is—Couldn't he have fed these cows cheaper by putting in another ton of silage for the year and taking off about $5.00 worth of that concentrated feed? I think he fed pretty high on concentrated feed. What do you think about it, Mr. Bradley?

Mr. Bradley: Last season I was very short of pasture, and some of this concentrated feed was fed during the summer, so that I fed a little more than I have done in years past. I also had to feed some ensilage during the summer. My cost for keeping cows during the past year was some two or three dollars more than the year previous. I had to feed hay all through August and September, which of course made a difference.

Mr. Peck: I think what Mr. Bradley says about his pasture being short, partly explains why No. 9 is cheaper. He probably

had better pasture for his cows, and they stored up energy in the summer time for the winter.

A Member: I believe, taking one year and another, Mr. Bradley's expense would be altogether different. Last year was a very trying year.

Mr. Bradley: Yes, as a rule it would cost less.

A Member: I want to say that when Mr. Cheney was making this census, some of us didn't know exactly what he wanted, and I can see that some of the estimates he has there should have been reduced considerably. Some of them did not think to mention, for instance, that when the cows went dry they didn't get much, if any, dry feed. Still, taking all these things into consideration, this is certainly a great lesson to us all.

Recess to 1:30.

The Convention met at 1:30, same day.

The President in the chair.

THE DAIRYMAN AND THE STATE FEEDING STUFFS' LAW.

Prof. F. W. Woll, Madison Agricultural Experiment Station.

I was very glad to be present for a while this morning and see the earnest attention that you gave to the discussion of the paper that was read, and to see the enthusiasm with which the topics that came up were discussed, and I hope that enthusiasm will be continued throughout the sessions of the convention.

It needs no lengthy argument to show that the dairy farmer is or should be vitally interested in the subject of pure feeds. Among the results of experimental work with dairy cows conducted during late years, none has been brought out more prominently than this, that the production of the herd and the economy of the production are, as a general rule, as much dependent upon the kind of feeds the cows receive and the system of

feeding followed, as on any other single factor. The grain eaten by a cow during the year costs nearly as much as the rest of her ration when she is fed according to approved modern methods; that is, it will cost a farmer on the average about $15 a year for concentrates, or for a herd of, say twenty cows, something like $300 a year. This presupposes feeding four to five pounds of grain feed per cow on the average for each day in the year. Even if we assume that only half of this amount is fed on the average for all dairy cows in the state, it will mean that the feed bill our dairy farmers have to pay annually amounts to toward $10,000,000. This annual expenditure is not likely to be smaller as time grows on, rather the other way. While the expense of raising a good crop of hay or corn has not greatly increased of late years, the cost of concentrated feeds has, to the extent of 25 to nearly 100 per cent during the last dozen years, and present high prices will not in all probability go down in years to come. Taken in connection with the fact that liberal feeding will become more general with the adoption of modern methods of feeding and management of dairy herds, this will naturally render the feed question of still greater importance in the future than it has been in the past and make it more desirable than ever to consider whether or not full value is received for the money paid out for concentrated feeds.

It is only a short while since the state began to concern itself with what kind of feeds manufacturers and dealers sold their customers. If the feeds were sold for pure, unadulterated goods and were made up of mixtures of worthless materials with enough of the genuine stuff mixed in to pass for a fair article, there was no one that cared especially, except the buyer of the feed who was imposed upon, and honest manufacturers who had to meet unscrupulous competition and often could not do so, because the adulterated goods could be sold so much cheaper than the pure article and, unfortunately, often sold as readily. Only a few years ago some samples of wheat bran were forwarded for examination to our Experiment Station laboratory, which contained one-third to one-half of finely ground corn cobs and corn stalks, and still looked like a fair quality of bran unless examined closely. Even then the amount of worthless material found therein would not be apparent. The manufac-

turer and dealer handling pure feeds would be hurt just as much by the sale of such bran as the person buying it, for it could be sold at a much lower price than the pure article and yield a larger profit to the manufacturer at that.

Adulteration of mill feeds with whole and ground screenings, and of ground corn and oats with ground cob or oat hulls, has doubtless been practiced by dishonest manufacturers as far back as there have been buyers of cheap feeds, but during recent years adulterations in commercial feeding stuffs have become more frequent than was formerly the case, both on account of the gradual increase in feed prices, making it more profitable to adulterate, and because of the growth of certain manufacturing industries, which furnish large quantities of refuse materials that can be bought for a song, and used as adulterants of common feeding stuffs.

I need only refer to advertisements of oat hulls "unground in bulk, ground in bag," given in trade papers. See, for instance, last December issue of the Milwaukee "Flour & Feed." If there are any legitimate uses that ground oat hulls can be put to except for firing a boiler, they have not come to my notice. Neither can ground corn cobs be used legitimately in feed mixtures, as they are worthless as a feed when fed alone and, as a rule, reduce the feeding value of feeds which they are put into; and still, only a couple of years ago, we were told by a prominent Milwaukee feed broker that he had, that winter, shipped to Baltimore 30 car loads of wheat middlings adulterated with ground corn cobs. The reason why he volunteered the information was that none of it had been sold in this state, as he had had no call for it, he said, presumably owing to the character of the feed inspection work done here.

This testimony furnishes the best argument that could be asked for the continuance of this work in the case of mill feeds, as well as for other feeding stuffs. A Massachusetts bulletin just received also calls attention to the presence of adulterated wheat feeds on the market in that state and asks why consumers are willing to pay as much for a feed containing between 30 and 40% of ground cobs as for a high-grade wheat feed. The reason is that the majority of feed buyers are not at all discriminating in the matter of purchasing feeds, and think more about the price asked for a feed than about its quality. The cheapest is not always, nor indeed in the majority of cases,

the kind of feeds it will pay a farmer to buy. "Cheap and poor" holds true in regard to feeds as in the case of most other kinds of commodities.

There has been a greater danger of adulteration of feeding stuffs during recent years than was previously the case, partly, as suggested, on account of immense quantities of cheap adulterants having been thrown on the market by large manufacturing concerns and, partly, through the influence of modern business methods which bring strong competition between manufacturers of different kinds of feed articles and involve sales on small margins of profit. This condition of affairs is now generally understood, and a majority of the states in the Union have taken steps to protect their people against deception and fraud in the feed business, by passing feed inspection laws. These laws provide for sales of feeding stuffs under their true name and under guarantees of contents of valuable food ingredients in the same. Connecticut passed the first law of this kind in 1895. Other New England and eastern states followed the example set during the latter part of the nineties, and gradually more and more states placed on their statute books laws governing the sale and analysis of concentrated feeding stuffs within their borders, until at the present time every state east and south of us and a number of western states have put such laws in operation. Over 30 states in the Union have feed laws at this time. Our Wisconsin law was passed by the legislature of 1901, largely through the efforts of officers of your association, and has been in operation since January, 1902.

This fact that a majority of the states now have feed laws on the statute books, is in itself evidence of the necessity of such laws under modern business conditions. I suggested other reasons why these laws are necessary. Every year since our Wisconsin law went into effect we have had striking evidence that it has had a wholesome effect on the feed trade in this state; through it feed buyers have been able to obtain a much better grade of goods than they would have had for the existence of the law, and what is equally important, serious adulterations of feeds have been prevented or nipped in the bud.

As proof of the correctness of the first statement, I may refer to the quality of the ground corn and oats, or ground feed, so called, at the beginning of the feed inspection work of this

state seven years ago and last year. During the first two years after the feed law went into operation, 59 and 51 per cent of the samples collected by our inspectors in the feed stores in different parts of the state were either adulterated or of such low quality that it could not be definitely stated whether they were adulterated or whether only very poor materials were used in their manufacture. During the last few years only about 10 per cent of the samples collected have been at all suspicious or low-grade, and not a single sample of ground feed has been found for three years past among those collected that we could say positively was adulterated. The change worked in regard to this feed, of which immense quantities are sold in the cities and in the northern part of the state, is therefore most striking. We are doubtless taking a conservative position in stating that through the improvement in the quality of this one class of feed alone, buyers of concentrated feeding stuffs have been saved tens of thousands of dollars every year and it has, in the aggregate, easily been worth as much to the State as it takes to run our Agricultural College and Experiment Station for a year.

The adulteration of ground corn and oats with oat hulls or corn cobs is relatively harmless and affects mainly the pocket-book of the buyer, but we have had cases where directly injurious ingredients have been mixed into cattle feeds. I refer to the use of ground rice hulls as an adulterant of mixed feeds. Rice hulls are provided with fine sharp barbs, which are liable to become lodged in the intestines and cause impaction of the bowels and death of the animals eating feeds containing large quantities thereof. Southern farmers and breeders of cattle have found this out to their sorrow. This material is used in the south as a fuel and for packing eggs or adulterating feed stuffs. Several car loads of it were imported into our state a few year ago, but through prompt action on the part of the feed inspection department, and through the co-operation of our feed dealers, we succeeded in preventing its use for adulterating feeding stuffs sold in this state. Less than two years ago we again came across it, however, in samples of molasses feeds and dried brewers grains put out by a Milwaukee firm and at once took steps to stop the manufacture and sale of these feeds. Since the direct injury that may come to buyers

of feeds and their stock through the sale of feeding stuffs adulterated with rice hulls is now well understood by our feed manufacturers and dealers, we do not anticipate that this form of adulteration will appear again for perhaps a long time to come. The temptation to adulterate feeds increases, however, with the gradual rise in the prices of feeding stuffs, and the manufacturers of mixed feeds every once in a while receive quotations for carload lots of ground rice hulls from southern millers or commissionmen, with special attention called to the profit that can be derived from the use of this material in making mixed feeds. There is therefore no certainty when attempts will be made to use it again, but by keeping a sharp lookout and by prompt action in dealing with offenders, we feel confident that we shall be able to prevent any serious damage being done from this source to the farmers of our state and other buyers of concentrated feeding stuffs.

I might stop here, as you will doubtless consider that even the few suggestions made, amply justify the existence of this state feeding stuff law and show that it will be as necessary to keep the law on our statute books as it was to place it there seven years ago. One other point should, however, be mentioned. Two years ago the legislature changed the law so as to include mill feeds and malt sprouts under its provision, thus rendering these subject to license and inspection, as is the case with all concentrated feeding stuffs, except the pure grains sold separately or the unmixed meals made directly from these. This amendment which went into effect a year ago, met with determined opposition on the part of a few individuals of the State Millers' Association. While the opposition has come largely as stated, it is only fair to say that a majority of the merchant millers in this state are opposed to the law as it now stands, although as law-abiding citizens they conform to its provisions so long as it is in our statute books. The claim is made that the law is "unconstitutional and void, and in violation of the constitution of this state and the United States," the reasons given being, in effect, that the law exceeds the police power of the state and discriminates in favor of small millers in the state against merchant millers in and outside of our state. A test case was started last summer at Antigo, this state, and was won by the state in the municipal court at Antigo, and also

in the circuit court of the tenth judicial district. The case has been appealed and is on the supreme court calendar for the January term (Case 42, State vs. Goldberg). The decision of the supreme court is not likely to be rendered before next spring and meanwhile the present law will, of course, be enforced to the best of our ability. We know that it is a good law and that it has had a most wholesome effect on the feed business in this state, and it would therefore, in our opinion, be next to a calamity to have the law or any important provision thereof declared null and void. Without being able, perhaps, to look at the matter from a legal point of view, it does seem to me that each and every objection which those opposing the law have put forward, is fully covered by decisions handed down by the supreme court of the United States or of the various states. While it is readily granted that the law puts some hardship on feed manufacturers in the way of exacting a license fee, guarantees of valuable feed components, labeling or stenciling of sacks, etc., it is in reality to their advantage to do so, as it gives consumers confidence in their goods and protects the manufacturers against dishonest competition and misrepresentation. Even if such were not the case, they should be willing to go to some trouble for the common good. The public has an unquestioned right to know just what they are buying and to be protected against frauds in the sale of feeds for animals, as well as for man, and it is for you dairy farmers, and for all good citizens, to see to it that efforts which may be made to have the law repealed by the next legislature shall not be successful. Everybody's business is always in danger of becoming nobody's business, but we trust that if it comes to a fight before the legislature this winter, we shall have the hearty support of all who keep and feed farm animals, or whose material welfare is dependent on the agricultural industries of the state, so that our law makers will not be left in doubt as to whether or not the people of the state think this is a good law and ought to be left on our statute books.

DUSCUSSION.

Prof. Woll: As you know, mill feeds are by far the most important concentrated feeding stuffs on the market in our state.

As a rule, the feeding stuffs on the market in our state are good, but it is for the exceptional cases that we have to have a law that will bring the offenders to justice.

The Chairman: Do you find more adulteration in bran than in middlings?

Prof. Woll: I won't say that, but it is a good deal easier to find it. You can find it in wheat bran by inspection, but in middlings it is ground up very fine, and often it is very difficult to tell it. You have to make a careful microscopical examination of middlings to tell whether they are adulterated or not.

The results of the feed examinations are published in bulletin form by the experiment station from year to year. Each year a feed bulletin is published, and farmers who are buying feeds for their stock will do well to procure copies of those bulletins. You will find listed there all these feeds that are manufactured, with the name of the manufacturers and the name of the dealers in whose stores the samples were purchased, and if you continue to buy poor feeds under those conditions, and do not take advantage of the information which these analyses and discussions give you, really you have no one to blame but yourselves.

Mr. Goodrich: What is Ajax feed made of?

Prof. Woll: Ajax Flakes is dry distillers grains, the refuse from a whiskey distillery. I believe that there are different kinds of whiskies. I cannot say I know so much about it myself, but they say that whiskey and whiskey are two different things and the mash that they make the whiskey from varies considerably, and therefore the composition of Ajax Flakes varies also. But on the whole, it is feed that is pure, that has no foreign adulterations. It is just as it comes from the distillery after having been dried, and it is very rich in protein and rich in fat, contains about as much protein as oil meal, and more fat. In feeding experiments that have been conducted this winter, we find that it has about a similar feed value as oil meal. It

would not be as valuable for feeding young stock as oil meal, in fact, it would not be specially adapted for feeding young stock, because it is quite oily and not flaky, but for feeding dairy cows it would be about of equal value to oil meal. When it comes to a question like that, a comparison between oil meal and Ajax Flakes, two feeds that have similar feeding value, then you want to consider the prices and if you can get it cheaper, you had better buy it if it is for grown up stock.

A Member: What is the difference between gluten meal and gluten feed?

Prof. Woll: Gluten meal is practically only the gluten of the corn with some common matter. It is more highly nitrogenous than gluten feed, which is gluten plus the corn bran. Gluten feed is only a product from starch from the glucose factory that you get in this state; you cannot buy any gluten meal in this state to my knowledge. It is a very valuable feed in every way, but the glucose and starch manufacturers have found it did not pay, and now make one product instead of three, gluten meal, gluten feed and corn bran. Now, they make it all into gluten feed, which is a very valuable feed, containing about 26 per cent protein, and a little less fat than oil meal.

Mr. Goodrich: What is Badger Dairy Feed?

Prof. Woll: It is a mixed feed; it is a little difficult to say what it contains. We know what the manufacturers say they put into it, but it contains screenings and brewers refuse, some malt sprouts and molasses. It has been tested a great deal in the state during the last year, Now they grind the screenings so that they have more wheat seeds in it and there is no objection to the feed.

A. Member: Will this gluten feed be of more value than Ajax Flakes or less?

Prof. Woll: Gluten feed will not be as valuable as Ajax Flakes; it is lower in protein and in fat. It is made up from the dried-up mash in the whiskey distillery as, Ajax Flakes is. In the manufactory the starch is removed and you have the dry refuse from the distillery after the starch has been taken out. We have found the Ajax Flakes a very valuable feed and ordinarily you can get it a little cheaper than you can corn meal and for the purpose of feeding dairy cows I should say

it ought to have the preference. There is this comforting fact in connection with both starch grains and glucose products and that is, that they are pure. They come from establishments where they are left after the starch or the glucose is removed. The refuse products are of little importance, and it wouldn't pay to adulterate them. But still it is well to examine the analysis always to see whether the manufacturers are in the habit of furnishing feed that is standard, and that you can find out by referring to our feed bulletins. If you will hand me your name or write to the experiment station at Madison, asking that your names be placed on our regular mailing list, those bulletins and many others that are published by the experiment station will be sent to you.

A Member: Do the Ajax Flakes contain cob ground?

Prof. Woll: No. It is of great importance to the manufacturers to have only grain, no cob. We have found that they are pure.

Mr. Goodrich: One thing we farmers want to know is, which is the most economical feed for us to buy? We want to buy the right kind of feed; we want to supply a cow with the right elements of feed, but we want to get it at as low a price as possible. Now these are the prices of the different feeds down at Fort Atkinson, and I will read them to you and ask your opinion as to which is the most economical. Here is bran, $23 a ton; gluten feed, $28; oil meal, $34; Ajax, $33 and Badger $27.

Prof. Woll: Bran and gluten feed are without question the most economical among those you mention there. All mill feed has something of a fancy price because it is well known to dairy farmers and it is a little higher than you can get some other materials that may be as valuable a feed, but at the prices you state I would say that wheat bran and oil meal are the feeds that we ought to get. Mr. Goodrich has figured out from the tables the per cent of digestible protein in bran and gluten feed. Of course if you are buying those feeds just to get flesh-forming materials, you can buy digestible protein cheaper in gluten feed than in wheat bran, but there are other food materials of value in bran and in gluten feed that determine what they are worth to you. The first problem that we can have in regard to the value of feeds is to figure on the total digestible matter,

not only the protein but the amount of carbohydrates; that is, starch and fat and other nutrients in the feed, and considering that, I would say that bran is the most economical feed and gluten feed would come next. Now, between Badger and bran, bran at $23 and Badger at $27, there is no doubt in my mind but what it will pay you to buy bran. The manufacturers themselves do not claim more than that it is somewhat more valuable, ton for ton, than bran, and it is fair inference that if there was more in it, they would certainly claim it.

The Chairman: A good many farmers think when they buy bran that they want to get bran that weighs at least fifty or sixty pounds to the bag. Is that the proper rule to go by, or the proper kind to buy?

Prof. Woll: There are two kinds of bran on the market, country bran, or old-fashioned bran, and flaky bran, and the question is often asked which is the more valuable, and it is somewhat difficult to give a general answer to that question, because it will depend upon what you are buying the bran for and what other feeds you have to go with it. If you want a bran that is as rich in protein as possible, the flaky bran will be more valuable to you than the more floury kind, or country bran, but not quite as digestible. But the total digestible matter is still ahead on the flaky bran.

The Chairman: A good many of our good dairymen are feeding middlings rather than bran, claiming they get a higher content.

Prof. Woll: They do, but they have to pay more for it. Middlings, as a rule, are one to two dollars a ton more than wheat bran, but it is somewhat more digestible and is worth just about that much more. It will depend on what you are feeding it with. In case of corn, oil meals and other heavy feeds, it will be better to feed bran, but if it is not necessary to lighten up the grain feed, then you need not consider anything but the total nutrients of the two feeds, and in that case I should say that the relative value of the two feeds stand about in that ratio, that middlings are worth one or two dollars a ton more than wheat bran.

The Chairman: Suppose you are feeding ensilage, would you prefer to mix the middlings with the ensilage in order not to get it into a doughy condition?

Prof. Woll: Bran would be better. That question came up this morning in connection with your dairy practice, and it is a little risky to take issue with the feeder of Loretta D., a man of Mr. Scribner's reputation; but we have some pretty good cows in our country and we never give our grain feed on silage; we always feed it separately. I don't know that it makes any difference, except that we want to accustom our cows to one method of feeding and make as few changes as possible, but I think a concensus would show that more dairymen feed silage and grain separately than together. At least from our experience we can say positively that you get good results from feeding them separately.

A Member: What is the difference between buckwheat and wheat bran?

Prof. Woll: Buckwheat bran is a very vague term. Buckwheat bran as we understand it, is just the black seed coats of the buckwheat kernel. It is very woody and very light and absolutely worthless as a feed. It contains fully one-half woody fiber, and you might as well feed your cows on chipped fence posts as buckwheat hulls. But buckwheat middlings are a very valuable dairy feed and if there is a fair proportion of buckwheat middlings to mix with the bran or with the hulls, it is pretty good feed. I looked into the question last winter somewhat, in regard to the quality of the product that our mills sell as buckwheat feed, and I found that the proportion of clear hulls varied from one-half to three quarters by weight. Now, if we know the chemical composition of buckwheat hulls, as we do, and buckwheat middlings, it is very easy to figure just what composition the buckwheat feed will have, and I should say that a good quality of buckwheat feed ought to contain at least 12 per cent of protein and it will contain nearly 30 per cent of woody fiber. Now, feed like that is not as valuable as wheat bran by far, but it is a good feed and if we condemn buckwheat hulls we should not condemn buckwheat feed made with from one-half to one-third per cent hulls, because the buckwheat middlings is a very rich feed, and buckwheat feed, I feel, does not get quite the credit that is due it by many farmers, because buckwheat hulls are very flaky as you know and you see very little of the middlings. If you have a chance to buy buckwheat cheap, I would suggest that you take

out and weigh a portion, say half a pound, and then sift out the middlings in an ordinary sieve, and if you find that there is more than two-thirds of the weight in hulls, then it is a poor grain, but if you find it is half hulls and half middlings, then you have a good feed, one nearly equal to wheat bran and as a matter of fact the mills very often sell the buckwheat hulls at a valuable price compared with the price of other feeds.

The Chairman: I noticed a good many of our agricultural and dairy papers are advertising these stock feeds. What do you say about the value of those feeds?

Prof. Woll: They are not feeds. They are medicines, tonics —at least I should say they are claimed to be medicines, but they are not what they are claimed to be. They are as far from it as the west is from the east. They are advertised a great deal and a great deal of work has been done trying to show up the peculiar merit that is said to be in these feeds. I have not the figures very accurately in mind, but I should think at least a dozen different Experiment Stations have been working on these feeds to see whether they could establish any special merit for feeding them to cows, horses, sheep, swine or poultry, and in practically every instance the result has shown that they have no value and generally are even detrimental. It is difficult to say why they should be detrimental, because, as a matter of fact, they are made up of a very small proportion of condiment, and the rest of it is filler. Those condiments you can buy at any drug store at a very reasonable price, and the pharmaceutical dose is generally about the same as what they would recommend to feed other concentrated feeds, probably not over ten per cent condiment, so that they certainly are not economical and it is not wise for any farmer to pay money out for them; that is my view and that is the view of other people that have looked into it. If you want further information on that point, I suggest that you send to us for Bulletin No. 151 on Stock Feeds. The evidence is given in that bulletin, and you can draw your own conclusions. At any rate, I believe if you look into it carefully, you will not buy very much stock feed.

Mr. Goodrich: I had a little experience with stock feed. There was a man in Milwaukee by the name of Wilbur who manufactures Wilbur's Seed Meal, and he sells it for about 12 cents a pound. I met him in Milwaukee a few years ago, and

of course he wanted to sell some to me, but I declined to buy, but he wanted I should have some and experiment with it, and he says, "I will give you a hundred pounds, twelve dollars' worth of it, if you will make an accurate experiment with it for a long period of time and report actual results." I did it; I fed it to one row of cows that were producing just about the same as another row of cows. I fed it according to directions and it lasted all winter, and when I figured up the results, it paid me just about as much as so much oil meal at a cent and a half a pound instead of 12 cents. I had an idea from the appearance of it that most of it was oil meal and the rest of it was "Wilbur's seeds."

The Chairman: We had a little bit of experience with these so-called calf feeds. A man sent some to me and asked me if I would carefully try it on a row of calves. We didn't dare try it on a whole row, but we tried it on five calves and we only killed three—we fed too much.

Prof. Woll: It is only fair to say that most of the calf feeds sold in this state are good materials, only you have to pay more for them than mill feeds, which you can buy. They are made up of good feeds and there is no reason why they should kill three calves if a man understands his business. It is possible that the president may have been working on some of these calf meals that have more condimental materials in them.

Mr. Martiny: There is a feed that is being put on the market that is a combination of ground alfalfa and refuse from the sugar beet factories. What do you know about that?

Prof. Woll: We found those and also alfalfa meal. Alfalfa is coming to be recognized as one of the great dairy feeds. It is generally stated, although that is stretching it a little, that alfalfa is worth as much per ton as wheat bran. It is not quite as valuable as that, but good alfalfa hay is a first class feed for dairy cows. Now, alfalfa meal is supposed to be just the tender plant, leaves and everything ground up fine. After you have it in the form of meal, however, it is difficult to say what quality of alfalfa was used in its manufacture; you have no certainty that it was made from a good quality of alfalfa. Also it is generally too expensive as sold in the state.

Mr. Goodrich: Is it worth any more when ground into meal than when fed whole?

Prof. Woll: No, it is not, the cow can get just as much out of it, in fact there is every reason to believe that she can do better on hay than on finely ground meal. It doesn't change the character of the feed. Alfalfa meals containing molasses and other materials, are good feeds, but there is the same objection to all those feeds, that you have no assurance as to the quality of the alfalfa that makes up the bulk of it. What you want to do is to grow alfalfa on your own farms as one of the growing crops in all dairy sections, a crop which is growing in importance in all dairy sections of the state.

There is a special bulletin published by our experiment station on alfalfa that you might send for and get information as to how to grow it. This is one of the most valuable methods of cutting down the feed bill that we have—growing and feeding alfalfa. While it is not quite as valuable as wheat bran it comes very close to it. For five tons of alfalfa, we can figure on four tons of bran.

Mr. Martiny: What effect has alfalfa and molasses on the production of milk?

Prof. Woll: I should not imagine there would be any trouble about it, except you want to be very careful how you feed it. It is very laxative, and you want to watch your cows, but aside from the danger of their getting rather loose bowels, I can see no possible bad effects that would come from it.

Mr. De Witt: What is the value of sugar beet pulp?

Prof. Woll: That is coming to be quite an important feed in some parts of this country where sugar factories are operating. In Europe it is a standard cattle feed in all beet growing sections and worth about as much as bran ton for ton. Ordinarily you can buy it a little cheaper, but there is not much of it being sold in this state, because our manufacturers of beet sugar dispose of their dried pulp, either in the East or send it to Europe, but if you can get it at prices up to within a couple of dollars a ton under bran, it will pay well to buy it. It is a good, wholesome feed and the cattle like it.

Mr. Jacobs: How does common wet beet pulp compare with good corn silage per ton?

Prof. Woll: Wet beet pulp is such an uncertain quantity, because you get it sometimes from the factories where the water is dropping out of the wagons, while other times they press it

much more. I don't know that I can give any definite answer to that. If it is very watery and sloppy, it would not of course be as valuable. I might say that two tons might be worth a ton of silage, but not more than that in case of a rather watery condition.

Mr. Jacobs: Have you put it into the silo?

Prof. Woll: No, but it is being done, as I understand, and in that way preserved very well. The use of a feed like that is limited to the immediate vicinity around sugar factories, because it doesn't pay to haul it very far on account of the water content; also the sugar beet factories will doubtless, one by one, put in dryers so that patrons will not be able to get wet pulp in the future. There are two or three factories now that are drying all their pulp. In that way they get a material that contains less than ten per cent moisture and will keep indefinitely and it is good feed.

Mr. Goodrich: I have the analysis of beet pulp. It is 10.2 per cent solid dry matter and .6 per cent protein.

Prof. Woll: It is very low in protein, but it is high in other valuable contents, carbohydrates. There have been experiments in feeding cattle with the dry pulp against corn meal and bran, and they find that it is almost as valuable, ton for ton, as those feeds.

THE CALUMET COW TESTING ASSOCIATION.

By W. F. Rather, Calumet Harbor, Wis.

The subject of testing cows is a very important feature of the dairy work and the cry is going out all over the country, "Where can we get good cows." It is a subject that well may be considered, for by the securing of good cows depends, in a large degree, the success of the dairy business, and in failing to secure such, the best work can not be accomplished.

To Organize a Testing Association.

This work was introduced in Fond du Lac county by Mr. H. C. Searles in the year 1906. I must congratulate the officers of the Dairymen's Association in appointing Mr. Searles for this work. The first year Mr. Searles visited each farmer, one day weighing the milk and taking samples from each milking and did the testing at their homes and gave instructions to get the farmers interested in that work. After one year's work there was a meeting held on the 12th day of May, 1907, when the Calumet Cow Testing Association was organized with a membership of 44 farmers. An agreement was made that Mr. Searles would furnish a man who would do the testing and figuring for $1.00 per cow for the coming year, and the farmers to take the samples each month and deliver them to the testing stations which were the factories. At the end of this year's work another meeting was held. Mr. Searles said there were more associations organized in the state and that the Dairymen's Association was short of men who would fill the positions, so the factory men agreed to do the testing and keep up the work.

Testing Herds.

Some farmers have an idea that testing their herds for one year will be sufficient, but that is a mistake. Testing for one year and finding the profitable and the unprofitable cows is much better than not testing at all as it gives some foundation to work on but to get the full benefit from the work it should not be discontinued at the end of one year; it should be continued for a period of years. By sticking to a good thing year in and year out success is sure to follow. In my experience I found more beneficial effects the second year than the first. There are many dairymen who report the same results in our association. All the benefits of cow testing are not confined to finding out which are the most profitable cows. By knowing each month what each individual cow is doing, the dairyman is better able to feed and care for his cows. In fact, the work of testing should be an incentive to better dairying all

around. Wrong ideas in dairying are often responsible for dairymen keeping unprofitable cows for a long time and they cling to them as to old friends, even if the cash return from the product be small and the feed bill large. And so it is with many of the old, worn out ideas about dairying. Some dairymen never let go of them to the detriment of their own account and the advancement of the industry in general. But when it comes to improved methods and the adoption of ideas that are for their own personal interest, it is like pulling teeth to get them to take hold and stick to a good thing.

This clinging to old ways and worn out methods injures those who practice them more than anyone else. The loss from keeping unprofitable cows, while it retards advancement in dairying generally to some extent, falls upon the individual dairyman and he suffers more than anyone else. If he fails to avail himself of the means provided for helping himself, it is his own lookout. Hope lies in the younger generation of dairymen. The old fellow will cling to the past more or less all his days, but the younger generation with the future before them in which they have to make good, will be easier converted to better practices and more economic methods.

I would like to have given a full report of every herd in the association, but for lack of time I was not able to do it. I will give you some figures of the work of my own herd.

The first year I tested my herd, the best cow made 367.1 lbs. fat, the poorest cow 192.1 lbs. There were three cows in the herd that produced less than 200 lbs. fat during the year. The second year that I tested the herd the best cow made 305.8 lbs. fat, and the poorest cow made 232 lbs. I got rid of the cows that produced less than 200 lbs. fat. In the fall of 1907 in the months of November and December, I had five two-year-old heifers calve. Heifer No. 1 made 321.1 lbs. fat in a year. No. 2, 260.4 lbs.; No. 3, 252.6 lbs.; No. 4, 244.1 lbs. fat; No. 5, 224.6 lbs. fat. In the month of November, 1908, I had eight cows calve. In the month of December the best cow made 58.8 lbs. fat, while the lowest made 32.1 lbs. The average of the eight cows for the month of December was 44.7 lbs. fat. The milk was taken to the creamery and the price received for a pound of fat was 33 1-5 cents. Of the same eight cows for the month of January, 1909, the highest cow made 54.7 lbs. fat; the low-

est, 27.8 lbs. The average of the eight cows for the month was 42.8 lbs. fat. The price received for a pound of fat was 33 cents.

I hope that the figures stated above will convince every dairyman in this audience of the necessity of cow testing associations. I hope the time is near when every town in the state will have a testing association.

DISCUSSION.

A Member: Was that the average of all the cows?

Mr. Rather: No, it was the average of eight cows for each month. These eight all freshened inside of a week after the 15th of November, and that is the reason I put those eight cows into that work, because they had the same period to work in.

Mr. Jacobs: If you are going to test, isn't it important to put all your cows in?

Mr. Rather: I will keep up my monthly report. It is my intention to work on the full herd; start in every month.

Mr. Jacobs: Are you doing this testing yourself?

Mr. Rather: No, sir, our factory man is doing the testing and keeping up the work. We take the samples and carry them to the factory and he does the testing. At our second meeting, it was reported that the association was short of men to fill those positions.

A Member: What do you pay the factory for doing the work?

Mr. Rather: Five cents for each test for each cow per month, but we have to do the figuring ourselves.

A Member: That is sixty cents a year instead of a dollar a year.

The Chairman: How does that compare with the dollar system?

Mr. Rather: If you do your own figuring, it costs about half as much; the average is ten months.

Mr. Jacobs: What do you think is the general result? Do the farmers carry that out and keep the records up close?

Mr. Rather: There are a good many farmers who do not keep it up as they ought to, but still I think it is a great benefit. We have had discouragement in our test association. On the 8th of August, the factory where I take my milk was destroyed by fire and it took three months to rebuild, and some of us had to go as far as four miles to haul our milk, and that interfered with the testing. But they are taking it up again, and in the eastern part of the district in Marytown, there are twenty-four members who came in this month.

A Member: How many samples do you take during each month?

Mr. Rather: We take the samples of an evening's and a morning's milk, once a month.

Mr. Jacobs: Don't you think there are other advantages in weighing, besides keeping yearly records? Isn't it wise to watch your cows to see whether they are increasing or decreasing in their milk flow and to note the different effects of different feeds?

Mr. Rather: We have a scale right where we milk and we weigh frequently. Sometimes we weigh three or four days in succession to note whether the cows are falling off, or show any change. Where you have strange help to milk, I would prefer to weigh the milk at every milking, but where you have your own people that you can depend on, I say it does not pay for the trouble, but with strange help you can watch them a little closer.

The Chairman: There is no question but that we get more interested in our work when we do the weighing every time and keep records. If we neglect them, it gets out of our mind and we are not as full of interest as we ought to be. I know in our barn whenever we weigh the milk, we look back to see if there is as much as there was before and if there isn't, we want to know why, whether we have got all the milk, if the cow isn't feeding right or any other trouble.

Mr. Goodrich: How much time does it take to weigh the milk of each cow?

Mr. Scribner: It is so short, I can scarcely say.

WISCONSIN COW TESTING ASSOCIATION.

COW TESTING ASSOCIATIONS AND THEIR ADVANTAGES TO THE DAIRY FARMER.

By H. C. SEARLES, Fond du Lac, Wis.

Success in dairying depends upon the methods we adopt, as do other lines of business. If we are to engage in a certain occupation, we cannot study the fundamental points too thoroughly. In Denmark, cow testing associations have been in active operation for the past fourteen years, there being over four hundred associations in that country at the present time. This has been the direct means of raising their standard of butter per cow from one hundred twenty pounds at the beginning to two hundred twenty-four pounds per year. Figuring the butter at twenty-five cents per pound, this means that the revenue from butter alone was increased from thirty to fifty-six dollars a cow, per year, or that the gross income per cow had been almost doubled.

The average cow in Wisconsin produces one hundred and fifty pounds of butter per year, which indicates a chance for improvement in this country, and I believe this wonderful gain in production which was made in Denmark can be accomplished in Wisconsin.

The first cow testing association in Wisconsin was organized in Fond du Lac County in May, 1906, and proved of so much value to the dairymen of that district, that the work of organizing these associations has been continued, and at the present time we have thirty of these associations in twenty counties of this state with one thousand, one hundred members and a total of twelve thousand cows.

In visiting these associations one can see a marked advancement along the dairy lines. Breeders' associations are being formed in a number of counties and dairy farmers in general are realizing the necessity of using pure bred dairy sires to head their herds.

Good judges believe that in the entire country one-fourth of the cows do not pay for their keeping. As a matter of ordinary business prudence and a condition essential to success, every dairyman should study the individuality of his cows and keep a sufficient record of quantity and quality of milk product, and know approximately the cost of production, and systematically weed out his herd.

It would be well to have a standard for a satisfactory cow, and maintain this by promptly disposing of cows which fail to attain it, and gradually but persistently raise the standard of the herd.

If we are to be successful in dairying, it is essential that we have dairy bred stock. To illustrate this, I will give the production of two herds of cows which were fed and cared for under practically the same conditions. Herd Number One contained eighteen beef bred cows with an average of 3,964 pounds milk and 166 pounds of butter fat which, at twenty-five cents per pound, brought $41.50 per cow; herd Number Two contained ten dairy bred cows; average milk per cow, 5,732 pounds and 281 pounds butter fat which, at twenty-five cents per pound, brought $71.25 per cow, or a gain of $28.75. This is one instance of several which has been revealed through testing associations in this state.

The vast differences in production of individual cows in the same herd are only realized by weighing and testing a full year and keeping a complete record of same.

A great many farmers have, by my request, selected the cows in their herd that in their judgment were their best producers but found at the close of the year's testing that they were mistaken and that in many instances Number One cow was in fifth place, Number Four in second, and vice versa.

When these facts are brought out so plainly, it prompts men to be more considerate in breeding, feeding and caring for their dairy herd.

DISCUSSION.

Mr. West: There was a point made here yesterday by Mr. Lillie about samples being taken on the farm not making a reliable record. I should like to ask Mr. Searles to what extent he thinks unreliable records are made under this system in this state.

Mr. Searles: I have found very few that have taken unfair samples in my work. There is no reason why a man can not take those samples himself just as correctly as a man that is visiting his place, and he takes not a sample to put into the test bottle, but a composite sample large enough for a sample to be taken from.

Mr. West: Isn't it a fact that the farmers are more accustomed in this state to taking samples than they are in Michigan?

Mr. Searles: Perhaps so.

Mr. West: I don't think that the farmer has any interest in cheating himself, and he isn't cheating anybody else, so I don't see any reason for his not being absolutely honest. Our greatest trouble is in keeping up the interest, keeping people interested enough to continue this test. With Mr. Searles' help we have started some associations that died in their infancy, you might say, very young indeed. The creamerymen rather throw cold water on the work, though I believe it was one of the best things that could be done for the creamery, but the creamery men didn't think so, and I think they are standing in their own light in taking that position. In taking samples in this way, do you find they vary considerably?

Prof. Woll: How many of these associations are now in progress having a man in charge of that work?

Mr. Searles: All these on the dollar plan have a man in charge. There are six of those and we have twenty-seven of the others.

Prof. Woll: What is your opinion as to the relative value of the two kinds? Would you prefer to have them all done by the dollar plan, if you could?

Mr. Searles: I would, but there are localities where the herds are small and it is impossible to get enough cows to pay the man for doing the work.

A Member: Is there an association in Barron county?

Mr. Searles: No. There are associations on the other plan where they take their samples to the creamery, one at Dallas and one here at Barron.

COW-TESTING ASSOCIATIONS IN SOUTHERN WISCONSIN.

By RAY N. WEST, Ripon, Wis.

The work as it is being carried on in that section, is called, the "Dollar System." This system takes into consideration the three factors that determine the profitableness of a cow. First, the amount of milk produced in the year; second, the richness of the milk; third, the cost of production. On this last factor rests largely the value of the cow.

This work was taken up by Denmark in January, 1895, at which time the first association was formed which proved such a success, that at present Denmark has over four hundred associations in operation. The strides that Denmark has made in the increase of the average production of butterfat per cow and the great help this work has been in furthering the increase has caused other countries to follow in the footsteps of this little country, whose average yearly butterfat production per cow is 224 pounds, or just double what it was twenty-three years ago.

In an appropriation of $40,000.00 by congress a few years ago, for the benefit of the agricultural interests of the U. S., a portion has been spent in advancing the work of co-operative cow testing associations.

An organized association is composed of from twenty-six to thirty farmers who put into the test three hundred and fifty cows or over, at an expense of ($1.00) one dollar per cow, also furnishing board and lodging one day a month for the man who does the testing and conveying him to the next place. The members of an association live as near each other as possible, thus making a strong, easily handled association.

At their first meeting, a constitution and by-laws are adopted, a board of directors, composed of five members, is elected and from them are chosen the President, Vice President, Secretary and Treasurer.

These officers have the control of the affairs of their association and one of their first duties being the engaging of a man to do the work of the association. This man visits each place one day a month, for the year, weighing and testing the milk of each one for the day he is there and figuring the production for that testing period, using the day's work as a basis.

The feed fed each cow for the day is weighed and the amount and cost of feeding is figured for the testing period, using the day's ration as a basis. A testing period dates fifteen days each way from the day the test is taken, thus making twelve testing periods in a year's work.

Records of the production and cost of producing, made under this system, have been found by the U. S. Dept. of Agriculture to be the most accurate method of ascertaining the yearly work of a cow other than the actual production.

The first association formed in the United States was in Michigan in 1905. Since then, other states have taken up the work, until at present date there is a limited number scattered throughout the eastern states.

The first work under this system in Wisconsin, was taken up in Fond du Lac County by Mr. Searles in May, 1906. There are over four hundred cows on test in that association of which number over fifty produced less than 100 lbs. of fat for the year and one over 400 lbs. of fat.

In October of this year, this same line of work was again taken up, only more attention is now being taken of the cost of producing than there has been heretofore. That the amount of profit is regulated by the cost at which the product is produced, is as true in the dairies as in any other business.

A report of these associations and their location is as follows: Ft. Atkinson 22 members and 390 cows; Lake Mills 25 members and 320 cows; Whitewater 25 members and 350 cows; Tomah 30 members. 25 days' work and 330 cows; West Salem 27 members and 375 cows.

The man who does the work of one of these associations, is usually a student from an Agricultural College and his work,

other than keeping the records of the cows, consists in figuring the rations fed the cows and, if there is any chance of improving the ration either by balancing it better or feeding a cheaper ration as advantageously, it is the business of the tester to offer such suggestions to the feeder should he wish them. I have the work of a man's herd which shows the amount of benefit that man derived from feeding a better ration. His ration for the second month being better balanced and costing less:

Cost of feeding them $96.72, 16 cows returned in December, $196.16, profit 99.44. The sixteen cows in January returned $190.41 Cost of feeding them $73.43, profit $116.98.

All of these cows freshened before the first of December with the exception of one, which freshened December 2nd. This increase was not in one or two cows alone, but an increase of from fifty cents to a dollar and fifty cents each. Butterfat for both months being figured at thirty-two cents a pound.

We have at present date five associations in running order in the state and over seventeen hundred and fifty cows under test. These associations are located at the following places: Fort Atkinson, Lake Mills, Whitewater, Tomah and West Salem.

Mr. F. B. Wulff is in charge of the work of the Fort Atkinson Association, and I have some interesting figures from his work there, although the test has not extended over a long enough period of time to give more than a slight idea of what these individual cows may do in their year's work.

In closing, I will say that the men who are taking up this work throughout the state are the dairymen who are putting the most thought in their work and wish to improve their herds as rapidly as possible and they find this the most accurate and satisfactory method to help them in attaining the end desired.

The expense of a test like this may seem high to some men, but does not outweigh the advantages and benefits derived. As in my talks with a great number of the members of the various associations, throughout the state, they say that the increase in their profits made by the added interests taken in their herds by themselves and their men more than exceed the cost of the test, at the time it is made.

Another proof of the success of these associations is the plans that the members are making for next year's work. Numerous other advantages might be mentioned that are derived from

the co-operation of members of associations of this kind, but a breeders' association, I think, is the most beneficial of them all. These benefits may be as much or as little—depending wholly upon the extent of the co-operation of the members of the association for, as in all corporations, the benefits derived depend wholly upon the amount of co-operation.

DISCUSSION.

Mr. Jacobs: Will we have the tests of those cows for the year?

Mr. West: Yes, we have only been testing three months.

Mr. Goodrich: You are going to charge them for their feed when they are dry as well as when they are in milk?

Mr. West: Yes, we will have to if we expect them to produce milk next year.

Mr. Jacobs: In this method of testing, have you worked out any method by which an official test can be made of pure bred cows which would be accepted in the advance registry work?

Prof. Woll: It may be well to say in that connection that for some ten or twelve years past the Experiment Station has been conducting the testing of pure bred cows in this state. These tests have been made mostly by breeders of Holstein cows for a short period of time, seven days, consecutively. Of late this entire system of testing has gradually sprung up and we have now what we call semi-official testing, where our men go to the farm once a month and conduct tests for one day in case of Guernsey cows, or two days in case of Jersey cows. They go there once a month for every month in the year. Then the production of that cow is figured up, on the basis of the quality of milk on the test, and the breeders themselves furnish the milk records of the cows. The quantities of milk given, however, are checked up in various ways, so as to safeguard their correctness. Of late the question has come up whether or not this system of testing can be hitched onto the testing at the Station, the work that is being done. The work, of course, has been

limited to pure bred cows, and it probably has not very much importance here or any place where there are likely but few breeders of pure bred dairy cows, but I will say we are going to make an effort to combine the systems if the work pans out as we hope it will. We want to take that matter up with these various breeders of pure bred stock in the future and see just how the work can be best forwarded. Of course we are vitally interested in doing all we can for the development of the dairy herds of our State and whichever way is found to be the best, we shall try to take part in it.

A Member: Did I understand you to say that there were between twenty-six and thirty herds in those associations?

Mr. West: Yes, the association with the least membership had twenty-two—there were twenty-two days of work in that association. A man is not supposed to work on Sunday; he is supposed to spend Sunday at the place where he works Saturday, and there are four days during the month that he is not busy and he can work at anything else he wishes, or keep up his records in better shape in the few days that he may have outside of the number of herds he has visited.

Adjourned to meet the next morning.

FRIDAY MORNING SESSION, FEBRUARY 12, 1909.

The convention met at 9 o'clock A. M.
President Scribner in the chair.

The first business of the morning was receiving reports of committees.

Report of committee on Nominations read by Mr. Goodrich and adopted, as follows:

The committee on Nominations herewith report that we recommend the election of the present officers of the association for the ensuing year, namely:

For President, F. H. Scribner.
For Secretary, A. J. Glover.
For Treasurer, H. K. Loomis.
Signed by the committee,

C. P. GOODRICH, Chairman.
M. L. WELLES.

Report of the Committee on Milk and Cream scoring was read by Mr. Searles and adopted.

The following tables give the names and addresses of those who took part in the milk and cream contests and the score of each exhibitor.

U. S. BAER,
THOS. CORNELIUSON,
Judges.

MILK.

Number.	Name of Exhibitor.	Address.	Flavor.		Condition.			Score.	Remarks.
			Taste.	Smell.	Fermentation.	Cleanliness.	Acidity.		
			25	25	25	15	10	100	
1	Jacob Kohten.....	Barron.....	21	20	23	14	10	88	Unclean .
2	C. J. Orn.....	Barron.....	23	23	20	14	10	70	Smothered odor, possibly due to lack of aeration.
3	Albert Halverson...	Barron.....	22	19	21	11	10	83	Smell unclean.
4	Archie Nelson.....	Barron.....	22	20	22	14	10	88	Smell smothered.
5	P. L. Lehman.....	Barron.....	22	21	23	14	10	91 (5tn)	Tainted, unclean.
6	Wm. Bartlett.....	Barron.....	19	17	23	14	10	83	Smell and taste unclean. Manurial taint.
7	Peter Matthys.....	Barron....	23	23	23	14	10	93 (4th)	
9	J. F. Wichern.....	Barron.....	21	21	23	14	10	89	Tainted. Possibly from feed.
10	Louis Voll.....	Barron.....	21	22	22	13	10	88	Smothered taint. Possibly due to lack of aeration.
11	M. T. Spencer.....	Barron.....	24	24	21	15	10	94 (3rd)	
12	C. M. Strong.....	Chetek.....	22	18	22	14	10	86	Smell and taste unclean. Manurial taint.
13	L. P. Martiny.....	Chippewa Falls..	24	25	24	15	10	98 (1st)	
14	Fred Krahenbuhl...	Barron.....	23	25	24	15	10	97 (2nd)	

CREAM.

Number.	Name of Exhibitor.	Address.	Flavor.		Condition.			Score.	Remarks.
			Taste.	Smell.	Fermentation.	Cleanliness.	Acidity.		
			25	25	25	15	10	100	
2	C. J. Arn.....	Barron.....	21	17	24	15	10	87 (5th)	Smell unclean. Taste, slightly barny or wintry.
4	Archie Nelson.....	Barron.....	25	25	19	15	10	94 (1st)	
5	P. L. Lehman.....	Barron.....	22	16	22	15	10	85	Smell unclean. Manurial taint.
6	Wm. Bartlett.....	Barron.....	22	17	22	15	10	86	Smell and taste unclean. Somewhat resembling vegetable taint.
7	Peter Matthys	Barron.....	22	18	23	15	10	88 (4th)	Smell unclean.
8	Fred Krahnbuhl	Barron.....	22	20	23	15	10	90 (3rd)	Smell and taste unclean.
11	M. T. Spencer.....	Barron.....	23	21	23	15	10	92 (2nd)	Undesirable flavor developed by fermentation test. Smell unclean.

(The following remarks occurred during the reading of paper.)

Mr. Goodrich: What were the causes of the lower score?

Mr. Searles: They were scored off on taints of different kinds.

Mr. Goodrich: If I was a contestant here and my products scored off as some of those do, I would like to know what the matter was.

Mr. Searles: I want to say that it is evident that conditions are most favorable in this place. There was only one defect, and that was a gasoline odor in the cream house. There was a cement tank and the cream was immersed in it and everything was clean as a whistle, but there was that smell of gasoline in the room. That was at Mr. William Bartlett's place, and there was a little gasoline engine in the room.

Mr. Bartlett: I want to explain that my gasoline engine was out of order and was leaking and the odor was much more noticeable yesterday than it ever has been before.

The President: We all know that milk and cream and butter do take on taint very readily and we have to be very particular not to have any bad odor around.

Mr. Searles: The Whitman score is low tainted, possibly from the feed.

Mr. Whitman: I was feeding ground oats and clover hay and our clover hay last year froze out pretty bad and it wasn't clean clover. It was clover and weeds, all kinds, sorrel and everything mixed; that is the kind of hay we got. The oats were all right, but the trouble was in the hay.

The President: Probably the taint came from those weeds.

Mr. Searles: (Resuming reading of report). C. M. milk unclean, taint, manure odor.

A Member: I don't know how that happened. I cleaned the cow myself with a brush and the cow had been giving milk about three weeks. I milked her myself and went direct to the house; went into the separator room off the kitchen. It is a lathed and plastered room and ceiled. The side walls are painted and we try to keep it clean. I strained the milk into a glass jar that was ready and we covered it with a new cover. I thought of the rubber and thought possibly that would make a difference, but I couldn't see any other way to keep it tight; I had to take it twenty miles. I would like to have Mr. Goodrich or Mr. Scribner tell how that milk got such a bad score.

Mr. Searles: I should say that the udder of the cow was not quite clean and the sifting down onto your clothing drove that through. If there were any fine particles of manure on the cow's udder, they dropped down on your clothing and they would produce that flavor.

The President: Have you ventilators in your barn?

A Member: Yes, sir.

The President: I don't believe I would be afraid to drink some of that milk.

A Member: It can't be tasted in coffee, but that milk seems to be pretty bad.

The President: You can't detect taint so readily in coffee as in some other places. You take and pour it onto warm oatmeal, for instance, and you will detect it very readily. We have been furnishing cream to Milwaukee for a long time, and we haven't had any trouble with ours, but they tell me that where they have bad odors, it comes out strong on warm oatmeal, more so than anywhere else. This gentleman seems to have things in pretty good shape, including ventilation. If he had not ventilation, had bad stable odors and the cows were breathing that air over and over again, their whole system would become penetrated with it, and it gets into the milk.

A Member: How are you feeding?

A Member: We are not feeding as good as we ought to. We have had two dry years and we have a lot of stock with no silage. Our cows have been fed dry feed since the 20th of September; at which time our corn was all gone. We have a variety of hay, wild hay, clover hay, mixed hay and timothy hay. Our grain ration is ground oats and barley.

The Chairman: Sometimes the water gets tainted if a tank is open and we have heavy wind.

A Member: Our tank is not open, it is in the building but it is several rods from the barn and the building is studded up and boarded, inside and out, and under a shingle roof.

Mr. Rather: How often is that tank cleaned out?

A Member: That tank was thoroughly cleaned two weeks ago and some lime put in it.

The Chairman: You are a pretty decent sort of a fellow.

A Member: My wife thought so some years ago.

Mr. Goodrich: I don't have any idea that that is very ob-

jectionable milk, but you know that this was scored by experts with smellers equal to a foxhound; they can find anything that an ordinary person would not suspect. It would seem to me, from the gentleman's statement, that his conditions were almost ideal. Sometimes there are conditions about a cow that give a bad flavor to the milk that we can't tell anything about; I know it has happened on my farm, and ordinarily we wouldn't notice it unless it got to be very bad.

A Member: I don't know whether that rubber band was new or not.

A Member: How long was the cow in milk and what did she test?

A Member: The cow freshened three weeks before. I don't know what the test was.

Mr. Searles: She tested 5.2 per cent and gave twenty-five pounds of milk a day.

Mr. Welles: There is something about this milk testing business I don't understand. Two years ago I took some milk down to have it tested and the score given was 85. They said it smelt of the barn, bad flavors, etc. I wondered how it could get in and I don't know to this day, and I never got any satisfaction out of it. I took great pains in taking that sample and I don't have any trouble in shipping my milk.

Mr. Searles resumed the reading of the report, reaching the name of Mr. Cranefield, who won the second prize.

Mr. Cranefield: I brought my sample of milk down to find out what the trouble is with it if I can, rather than expecting to get any prize money.

Mr. Searles: There are no comments.

The Chairman: Well, the gentleman draws only second money, so there must be something wrong.

Mr. Halverson: What is the matter with No. 3?

Mr. Searles: Score 83; smells unclean. They couldn't locate any special trouble.

Mr. Halverson: I will tell you how we took our sample. I sterilized the bedding of this cow the evening before, she is clean always but this morning I washed her and milked right into this jar and my brother took the milk outside and cooled it. We have good ventilation in our barn, the King system, and it is well lighted. She gets ground oats, pretty good

clover hay and ensilage. The cow was clean, I know, but there might be some odors.

Mr. Goodrich: I believe, Mr. President, that all this is more the condition of the cow, something that we can't see—than anything else, and I will tell you why I think so. When I was working, making butter on the farm, or my wife was doing a good share of it,—but I looked after the stable end—I was selling butter at a fancy price, and I couldn't afford to have anything that was not just right. There had been no fault found with it, but after we had shipped one lot and kept some out to use, my wife, with her sharp smeller, discovered there was something that wasn't exactly right about it. I am free to say I couldn't smell it, and I couldn't taste it, and I thought I had a pretty good smeller, but she insisted there was something wrong about it. My wife said, when I told her I thought everything was all right at the barn, "It isn't in my end, I have looked everything over in the dairy house, and it isn't here." Then I asked the boys about the feed, if there had been any mouldy ensilage, or anything wrong, and they said no. Then my wife says, "Something is the matter with some of the cows." So she says, "Bring me the milk of each cow." So as soon as the cow was milked, we would take it to her, and she would examine it and she would say, "That's all right" "That's all right", till she came to one cow's milk, and right away she said, "There is where it is. It is that cow." When I got to Chicago I found that they had detected something. The customers never said a word about it, but the expert had found it. I wrote right back to my wife and I says, "For God's sake keep out the milk of Jane and Molly." That milk was kept out and after that there wasn't a sign of anything wrong.

Mr. Searles: I come now to the cream report. Mr. Matthis, score 88, unclean.

Mr. Matthis: That cream was taken out of the same can that scored 91.

Mr. Searles: Is your separator in the barn?

Mr. Matthis: Yes, the barn is ventilated with the King system. The separator is not where we keep the cows.

Mr. Searles: A separate room?

Mr. Matthis: To some extent; there is an alley through into the barn which is open.

POWER ON THE DAIRY FARM.

By PROF. F. R. CRANE, Principal Dunn Co. Agricultural School, Menominee, Wis.

Ladies and Gentlemen: This is the first time that I have had the pleasure of being in Barron county, and I hope it will not be the last time. I have been very favorably impressed in looking over these score cards, hearing about your cow testing for tuberculosis, noticing some of your fine farm buildings, and it has led me to the conclusion that Barron county must have a good many thinking farmers in it.

There are three classes of people on our farms today. In the first place, the first-class farmer, the thinking man, the business man, because if there is any class of business today that requires good horse-sense, it is farming.

The next kind of a man who is on the farm is the man who is not a careful thinker, the man who has intelligence, but who is careless in the manipulation of his business affairs. That man is not an entire success, but he is making farming go because the farm is back of him and not because he is on the farm.

The next kind of a man is the impossible sort of a fellow who cannot manage a business of any kind.

Now I ask you, "To what class do you belong? Are you a business farmer?"

I am to talk to you this morning about "Power upon the Farm" and I will say to you that the greatest power upon a good farm is a good man—perhaps you will tell me it is a good woman, and I won't disagree with you there.

What are the powers we are to use? Whether we are dairy farmers or not, we are looking for the best power that shall run the different machines used in our farm work. Some one has said it is the lazy man that is using power, but we don't believe that. I think it is the thinking man who uses power on the farm.

There are three or four kinds of powers. In the first place there is the old fashioned treadmill. I wouldn't even insult a mule by using it in a treadmill, much less a horse. If I used

anything, I should use the bull, thus giving him exercise. The power gotten from a treadmill depends upon the elevation of the floor, and if you arrange it so that it is raised to any marked degree, you will overwork your horse, a thing which you cannot afford to do very long. So I should say that about the only animal to be used in the treadmill is the bull, and it then becomes a "bully" power, from which you can get two or three horse-power.

Then we have the windmill. I have tested many windmills, and in a sixteen-mile wind the average mill will produce from two-thirds to three-quarters horse-power. Some of our large mills will run up to one and a half horse-power. A windmill is very satisfactory on a farm for pumping purposes if you have large storage capacity. It is a cheap power, no question about that, and satisfactory if you don't have to have a large amount of water all of the time. It is used for grinding purposes where small amounts of grain are to be ground.

The next power is that of steam. The dairyman always has use for steam in connection with the sanitary part of the dairy, but he may dispense with the steam engine where a cheaper power can be obtained.

We have now the internal combustion engine, known as oil, gasoline, gas and alcohol engines.

I have personally conducted many experiments with different gasoline engines, and have no hesitation in saying to the farmer that it is a satisfactory power. Occasionally it falls into the hands of a man who was never intended to have even a monkey-wrench. There is no excuse for any experienced man of average intelligence having trouble with a gasoline engine. We can teach anybody of ordinary ability in less than a week so they may run any gasoline engine that is made. There are very few complicated parts to understand, and you need understand but very few principles.

There are two types of gasoline engines: a two-cycle and a four-cycle. The two-cycle engine is a small power engine. We have heard of such engines made so as to produce twenty-five and fifty horse-power but up to the present time they have not been satisfactory. You buy a two-cycle engine and you buy plenty of trouble with it. The four-cycle engine is an engine that cleans itself, it fills, compresses, explodes and cleans. There

are four distinct movements of the piston and every time the engine gains power. The two-cycle engine is not economical; it is extravagant to run and you do not get the greatest power out of the same amount of fuel as if it were used in a four-cycle engine.

I say to you, do not buy an engine of a company that is not reliable; do not buy anything of any man unless he is reliable.

Much has been said about the farmers making alcohol from refuse upon their farms, but we must remember that there is more power in a gallon of gasoline than there is in a gallon of alcohol. You can afford to pay at the rate of fourteen cents a gallon for gasoline when alcohol is down to ten cents a gallon, as you would get an equal amount of power from either at that price. In other words, if you can buy alcohol at ten cents a gallon, you can afford to pay fourteen cents a gallon for gasoline. I suppose here you pay fifteen, sixteen or eighteen cents for gasoline.

Mr. Bradley—About fifteen or sixteen as retailed at the stores.

Prof. Crane: You can buy gasoline in larger quantities at from twelve and a half up. A gallon of gasoline will give the farmer better results than a gallon of alcohol. The Experiment Stations have proved it to our entire satisfaction. With gasoline we can get about a horse-power per hour out of every pint. If you have an eight horse-power engine, you will use eight pints of gasoline per hour at full power.

The question arises as to the size of power to buy. I should say to you, do not buy a small power. Figure exactly how much power you are to need for future work, then buy an engine that is from one-third to one-half larger than that. Do not think that you can get eight horse-power out of an eight horse-power engine because you can't do it. You can put that engine under the best possible conditions and you can get possibly eight horse-power, but use that engine; it begins to get a little dirty, there is some misfit somewhere, the adjustments will wear a little out of true, and the best you can do is to produce six or seven horse-power; so you must get an engine that is larger than you will actually require. It will cost a little more, but you can depend upon it as having about the power you need. If you are to need steadily, say six horse-power, it will cost you no more

to run that engine at six horse-power than to run with a six horse-power engine, and it will be more reliable.

Let me say a word about lubricating oil. Always use lubricating oil that is intended for gasoline engines. Never use ordinary oil for the interior of the engine for the valves will get dirty and the whole machinery will get stuck up. The valves upon a gasoline engine ought to be cleaned twice or three times a year, sometimes every two or three months, and I should do it whether it needed it or not. Clear out your cylinder by pouring in some kerosene oil. It cuts the gummy deposits.

If you are to let your engine lie idle for any length of time, put in kerosene oil and leave it, then when you get ready to use it again, run that out and let in gasoline until you have it well washed out.

Another thing, don't be careless in over-flooding your engine with gasoline. Of course, you cannot explode a gasoline engine unless defective. If you are a beginner, you might think that to turn on a little gasoline will give you little power; you keep turning on more and more, and the power runs up and turning on too much, the power falls off. We must learn that above or below a certain richness of gasoline in the mixture will cause a loss of power.

In purchasing a gasoline engine as a farm power; get a power of the size needed, locate the engine upon the best kind of a concrete foundation. If the foundation is uneven or insufficient, we loose power. Always locate the engine in a clean, light place. Do not put it under the stairs or in the basement.

After you have done all this, get the necessary tools to use with the engine and then remember that a gasoline engine needs no attention while running, but that it needs attention when standing still, and the time to give a gasoline engine attention is at the very moment that you close it down. Get it ready to work again.

Ninety per cent of the troubles with the gasoline engine come from ignition, and it is simply a question of batteries. Don't expect a battery to run for all time. They will run for a short length of time, but they are continually getting weaker. You may have been bothered every little while with an engine missing firing. Occasionally the engine will stop, and under those conditions, it is generally a question of batteries. Be sure your

batteries are right. You cannot always tell by testing the spark on the outside of the cylinder. I should recommend you to use the make-and-break spark with the primary coil and six dry-cell batteries arranged in a series. A less number of extra large batteries are sometimes used.

DISCUSSION.

A Member: Would it pay a member to have one of these auto sparkers to use in connection with his batteries?

Prof. Crane: Good question! There are magnetos and auto-sparkers. I think one is a good thing. We are using a magneto in our creamery at the School of Agriculture. We like it very much but the auto sparker is just as good. It will cost a little more, about $25; while the other will cost you $18 or $20. It will cost you anywhere from $1.50 to $2.00 four times a year for dry-cell batteries.

Mr. Bradley: I do my pumping and separating; that is all I use it for, and one set of those batteries lasts me about nine months. Maybe I can't tell when it is getting weak! I am having trouble the last three or four days with my engine. I tried the sparker this morning.

Prof. Crane: You take new batteries and put them in, turn your engine over, and I think it will be all right. Look to see if the points come together; see if they stick or are covered with a rusty deposit, and, if so, clean them. Sometimes we turn on too much gasoline and we then get a black smoke out of the exhaust! When it is a light blue color, it means too much lubricating oil; when it is a black smoke, it means too much gasoline. Too much lubricating oil hurts nothing but it makes your engine dirty. I should rather have too much lubricating oil than not enough and I should rather have too little gasoline than too much, because too much gasoline leaves a deposit and forms carbon within the cylinder.

The Chairman: Is it practical to arrange to heat enough water for the washing in the house with a gasoline engine?

Prof. Crane: You can heat a limited amount of water. You can heat water up to 190 without harm to the engine. We do not want water too cold in the jacket of a gasoline engine. If

the water is about 180 degrees, we get the highest efficiency out of our engine.

Just one thing about starting your engine. We sometimes have trouble in cold weather because the gasoline will not vaporize. I always use a little torch when the engine is cold, letting the flame play directly upon the carburetter. It is safe to do so.

A Member: Is a one-horse tread power equal to a one-horse power gasoline engine?

Prof. Crane: Yes. There are very few tread mills that will give you less than one and a half horse-power. Generally they are run at two horse-power. I should recommend that you buy a gasoline engine of not less than two. The smaller the engine, the closer the adjustments; you understand, larger engines have a wider range of adjustment.

Mr. Bradley: The engine I am using is a Fairbanks, guaranteed two horse-power. Isn't that sufficient for pumping water?

Prof. Crane: Yes, but it won't last as long as a three or four horse-power.

FEEDING AND CARING FOR THE DAIRY COW.

E. P. Goodrich, Ft. Atkinson.

Mr. President, Ladies and Gentlemen: I haven't a great deal of time, and this is a big subject, so I will try to condense to as small a compass as I can, and probably leave out a whole lot.

The feed and care of the dairy cow. Now, that means a dairy cow that I am going to talk about and no other kind. A dairy cow is one that is bred for dairying purposes alone. To begin with, to feed the cow right you have to commence back and feed the calf right and bring up the calf so it will be a good dairy cow.

Now, to feed the calf right, it must be fed so as to make it grow rapidly, develop its muscles, develop its capacity for tak-

ing coarse feed and not lay on a whole lot of fat. I contend that a dairy calf, to be the best, should be brought up differently from one that is intended for beef, because you want to guard against this habit of turning feed into beef.

I do think that you can take the best bred dairy calf in the world and feed it in such a way it will make an inferior cow.

I heard Prof. I. T. Roberts of Cornell University express this in about the best kind of language. He says that you bring up a dairy calf to be a heifer and make her very fat, and when you come to ask her to produce milk profitably, she will tell you, "I can't do it; you have taught me to make tallow." Now, there is a good deal in that. I won't go any further on how to feed a calf, because I won't have time.

When the heifer comes to be a cow giving milk, which should be when she is about two years old if she has been grown properly and developed as rapidly as she ought to have been—and I say this because I want her to commence the business of her life (which is the giving of milk) at as young an age as two years old, because if you let her go longer, there is this danger of her getting the beef habit. You may think I put too much emphasis on that point, but I am satisfied from my experience that it is a very important point.

When she is fresh, you want to be careful about feeding her very much heavy grain feed for a few days, but in the course of two or three weeks you can get her up to what we call full feed.

Now then, I believe in feeding the dairy cow to her full capacity. Now, don't get scared about that until you hear all I have to say about it, *her full capacity.* That means all the good milk-producing feed that she can consume and digest and turn into milk.

It takes a certain amount of feed to sustain life; she has to have that anyway, you get no profit from that. What she eats over and beyond that and will turn into milk is what you want to feed her and feed her all that she can make good use of. You may feed so much that she will begin to put on flesh. You just want to get her up to good milking condition and keep her there. Now, when I say feed her to her full capacity, I don't mean feed her all the grain feed that she will eat. She has got

to have a balanced ration, but you must also have a proper proportion between the coarse fodder and the grain feed.

We were talking yesterday about burning out cows by feeding them too high. There is no such thing as doing that if you properly proportionate the coarse fodder and the grain feed, and the rule that I have adopted in my experience is that she should have not more than one-third concentrated feed in her daily ration. You can feed her that way and there will be no danger of over-feeding. There are a great many cows that have been overfed with grain feed.

The cows that were in the dairy test in Chicago in 1893, produced wonderfully; they were fed very high on concentrated feeds. There were Jerseys, Guernseys and Shorthorns, you know, and some of the Jerseys produced remarkably well, but they were fed very high on concentrated feed. Brown Bessie, the champion cow of the world, had about twenty-three pounds of grain feed a day, and they were fed all they could get to eat, but every one of those cows was damaged. I have taken great pains to find out what those cows have done since they made those big records and not one of them has ever done anything since except "Merry Maiden," and it took three years for her to get back to her normal capacity,—and it was just because they were overfed on concentrated feeds, and consequently they ate too little of the coarse fodder.

Now, you will naturally ask me how much grain feed should you give? How much will the cow make good use of? I can't tell you, because I don't know what her capacity is, but if she will eat twenty pounds a day of hay and forage, and ten pounds of concentrated feed, then you will be safe; but if you should increase her grain feed up to fifteen pounds and she should drop off five or six pounds on the coarse fodder, why she might produce more milk for a while, but you are on dangerous ground.

The President of the New York State Dairymen's Association, Mr. Gilbert, an old dairyman, once expressed himself in my hearing about this way. There are three things that you want to watch: (1) To see that the cow eats her feed with a good appetite, a good relish; (2) watch to see that her feed is digested properly—if it is not, there is something wrong; she

is probably fed too much; (3) watch to see that she puts it into the milk pail.

You cannot feed all cows alike. You can hardly feed any two cows alike. Van Pelt, who fed the cows down at St. Louis, was an expert at feeding cows, and he hardly fed any two cows alike.

Here is one cow that wants a little more of the protein; another that wants a little more of the carbohydrates. If you are feeding a cow too high in protein, she will run down in flesh; give her a little more of the carbohydrates; or if she is putting on flesh and not giving as much milk as she did, give her more of the protein feeds.

Another thing: you want to see that your cows eat with a good appetite. Never have feed lying before them uneaten. Many men will fill up the mangers with the best kind of hay, and the cow will eat what she wants and then she will lie down and she will be breathing on what is left and then she won't like it and she won't eat it so well as if you give her what she will eat and clean it up at once.

You can go into the barns of the best horsemen any time of the day and you won't find a spear of anything before the horses only just at mealtimes; and you know that is better with all animals. A man has got to be with his cows and watch them all the time; know all about them. A man that you hire to feed your cows will throw the feed into this one and that one and then go right out of the stable as quickly as he can, as though it was a disagreeable place in which to stay; he is no cow man. He won't stay there; he doesn't like the sight of a cow.

That makes me think of a little story. You know I like my cows; I would rather be out at the barn than anywhere else. A man came to our place one day and asked my wife where Mr. Goodrich was. She says "Probably he is out in the barn." "Does he stay out there in the barn all the time with the cows?" "Well, he spends considerable of his time out there." He thought he would say something smart, so he says, "If I had as good looking a wife as he has, I wouldn't be out with the cows." My wife ruffled up right away, and she said, "I would rather have a man associate with cows than associate with some men I know of."

I think I told you yesterday about my way of feeding. I haven't been running the farm myself for some years, but when I did I had as good clover hay as I could possibly make. I fed my cows some clover hay in the morning, and when they had eaten about so much—I knew about how much they would eat, here is Bessie, she eats about so much, and Lizzie would eat twice as much, and so on through the list,—I took what was in the manger right away. I wasn't going to have it there and they wishing they could eat it and couldn't. And do you know, the clover that was left was the best kind of stuff to feed your colts and horses, so it wasn't wasted. Then the cows were milked and I fed the corn feed and grain separately. Mr. Scribner puts his grain on the silage. I guess I won't quarrel with him about that, but I fed separately and I think it is the best way. Then I fed silage, about fifteen pounds to a cow. That was their morning's feed. Then at noon I fed them cut corn fodder or fodder corn, so as to give variety, you see. Then, at night they were fed about the same as in the morning, their grain fed twice a day and silage twice a day, making about thirty pounds of silage a day. They were watered twice a day.

Now, while I speak about water, I want to say what I think is the best way. I think it is the best way to have the cows watered every time after eating; if they are fed three times a day and their water is put into the stable in front of them, they will drink three times a day. Oh, but here a man says, "My cows won't drink but once a day." It is a habit that they will get into either way, and they will do better if they have the water where they can drink oftener, and I will tell you how I came to learn that.

One of my boys had quite a big farm out in Iowa; he had seventy-six head of cattle, most all of them cows. He put in a watering device that kept the water at the temperature of the stable; it is called the Buckley watering device. The water rises in a basin to a certain height and is regulated by a valve in the reservoir and the cows can drink whenever they want to. After my son had got that installed, one time when I was up there, he said to me, "Now, I have found out when a cow wants to drink." "When is that?" "Just after eating." Well, that seems to be so. They say that the time to water a horse is

before eating, but a cow has different machinery than a horse. I went out in the morning when he fed the cows. I saw all those cattle, seventy-six head, eating and as soon as they finished eating, they all drank and the water didn't come in fast enough, and every time he fed them, three times a day, they drank water after they were fed.

There is one fault about the Buckley watering device, and that is, that if it is left open it will get foul, because of scattered hay and other things. We had it fixed with covers and it didn't take the cows long to learn to raise the cover with their noses, and then it would fall back after they got through drinking. But the better way is to have a cement manger and sweep it out after they have done eating and then let the water in. Those cows certainly drank considerably more, and I think ate considerably more when they had water which they could drink at will, and almost every cow did better than when turned out once a day to drink at a tank, even where the water was warm and all right.

Now, why does the cow want to drink after eating? In the first place, when she is given a feed of coarse fodder it goes into the first stomach. It has got to be wet there before she can raise it and chew it again. You have all seen cows. when they raised the cud—sometimes the water runs out of their mouths. The water has got to be there whether it comes from the glands or some other way; the feed has got to be wet up and she naturally craves water. When it is all loose, floating in there, it gets rolled up into balls and then it is raised; she chews it and digestion has begun.

Now, I want to say something about feeding grain on coarse fodder. When she eats grain it doesn't go into the first stomach, it goes right on by, there is a sort of a switch there—I don't know just exactly how it goes right on by, but it does. Nature makes an effort to separate the grain feed from the coarse feed and one run one way and the other the other way.

The Chairman: How do you know?

Mr. Goodrich: I will tell you how I know. There was a man down at Pewaukee, John Hodgson, a genius and an investigator, who was going to find out things; he was just a crank on that. There was a butchershop not a long distance from him and whenever animals were brought in, he would ask

permission to feed them, two, or four, or six, or eight, or twelve hours before they were to be killed, so he could learn something, and then he examined them after they were killed to see where the feed went. Now, that was a new kind of a study, but he found that meal was actually separated from the solid feed when it was put into it; the meal had been strained off and it was separated from the coarse forage. He fed cattle corn in the ear with the husks on it. You know they can chew up husks and shell off the corn and some folks actually thought that cows could raise that corn and re-chew it. But what do you suppose John Hodgson found out? He found that the corn they shelled off went right into the second stomach, and not a kernel of it was with the husks in the first stomach. Now, can you tell me why we should put meal on silage?

You want to feed cows a variety; they like a variety just as well as you do, just exactly. How would you like to be put on one kind of food all the time? I met a man and I was down to his place. He had a lot of fine dairy cows; they cost him on the average of $200 a cow, and yet they were not doing very well. He said he was feeding corn stover and nothing but that for coarse fodder. He remarked that he wanted to feed that before the snow got so deep; it was too much trouble to haul it in. That was the reason his cows were running down and lots of that good feed wasted. He said, "I always feed that all out first. Then after that I will feed them clover hay, because that is on top of the mow. We will get rid of that, and then in the spring, when that is all fed out, I will feed my timothy hay." At the same time he realized he was not getting as much out of his cows as some of you fellows tell about. Now, it would be just as sensible for a man to say, "Now, wife, our cellar isn't very good and I am afraid potatoes will freeze this winter, so we will live the forepart of the winter on potatoes; then when it comes cold weather in the winter, I will kill a beef, and we will live on beef through the cold weather; it will keep fresh. Then when it comes milder weather in the spring we will live on bread." You would call any man that would talk like that a fool, but men do undertake to do that very thing with their animals right along, and their animals get awfully sick of it. They want it mixed up. You know potatoes and meat and bread are all good feeding,

but you want to have a little of one and a little of the other, and it is just so with the cow.

Then again you want to feed regularly. I tell you I believe it makes just as much difference to a cow as it does to a man. When feeding times come, they want to be fed. You could go into my stable when it is not feeding time and my cows would be lying down, chewing their cuds, they would not pay any attention to you. But you go in there just about feeding time, and every cow will jump up. They can tell the time of day just as well as you can by your stomach. It makes a man feel cranky to have a meal a little late sometimes. You come in from the field at noon, your watch and your stomach tell you it is dinner time, and you expect to have dinner, and you have to wait around an hour. Why, I tell you I have suffered more that way when I was a boy—it wasn't my mother that kept me, it was some other fellow's mother, and I tell you it worried me. I know that cows do a great deal better fed regularly.

You want to feed succulent feed. You know a cow will produce more milk on grass than she will on hay, a good deal more. Now, hay is just grass, cut and dried; you have just dried out the water and maybe you say that you might put the water back if it paid, but you can't make grass out of it again, I can tell you there is something about the natural juices in it which makes it more digestible and the cows will produce milk a great deal better.

So now, in winter we ought to provide succulent feed for them. We can't have grass, but we can come as near to it as possible; we can take green corn and put it in the silo and it has got all its natural juices. It is almost equal to fresh forage cut in the field. Every one of us who owns a silo knows that cows will hold up their milk a great deal better through the winter when they have succulent feed.

So much for the feed.

Now, we must care for them just as good as we can; we must make a cow just as comfortable and happy as it is possible to make her. She has got to be confined, she cannot have all the liberty she wants, but we should give her just as much liberty as is consistent with cleanliness and safety. So make her comfortable; you ought to have up all around in your barn in great big letters the word "Comfort," "Comfort," "Comfort."

That is what makes cows do well. You may have the best kind of cows and feed them all right, but if you don't care for them so as to make them comfortable then they won't do well for you.

Recess to 1:30 P. M.

AFTERNOON SESSION, FEBRUARY 12, 1909.

The committee on Resolutions submitted its report which was unanimously adopted as follows:

The following resolutions were presented and adopted:

Resolved, That the Wisconsin Dairymen's Association make an urgent appeal to the Legislature of the State in support of the proposed special appropriation of $30,000 for the purpose of aiding the College of Agriculture in its effort to promote agricultural knowledge and practice by carrying on demonstration experiments, and conducting traveling schools of agriculture to be held throughout the State. The work already done by the college in tuberculosis, potato spraying, orchard spraying, dissemination of pure bred seeds, reclamation of wet lands by drainage, and other important subjects, has been carried on at the urgent demand of the people of the State, and at the expense of college funds, which are much needed for the prosecution of the regular College work at the University. The College of Agriculture is unquestionably the best agency of the State that is fully equipped in knowledge, men and material to answer to this most important demand. The live stock, fruit, and crop interests of the State are in serious need of the knowledge this kind of demonstration gives. The splendid work of our Agricultural College has contributed in no small degree to the high rank the State has taken in the production of seed, grain, potatoes, tobacco, live stock, fruit, and dairy products, and we ask the Legislature that it make this special appropriation in furtherance of these important interests so conducive to the welfare and reputation of our State, and hereby instruct the officers of this organization to lay this matter

before the proper committees of the Legislature at their present session for their most careful consideration.

WHEREAS, The Management of our State Agricultural College has been petitioned by this Wisconsin Dairymen's Association, also by the Wisconsin Buttermakers' Association, and the Wisconsin Cheesemakers' Association in convention assembled, to issue a bulletin for milk producers, illustrative and descriptive of improved stalls and arrangements that improve the sanitation and healthfulness in dairy barns, and

WHEREAS, The wants of milk producers along aforesaid lines have not been satisfied, therefore be it

Resolved, That we again urgently request the management of our Agricultural College to issue such bulletin. Be it further

Resolved, That copies of this resolution be sent to the president of the State University, to Dean Russell and to the Committee on Agriculture of the Board of Regents.

WHEREAS, The State feeding stuff laws as they now stand have been the result of preventing in a large degree the adulteration of feeds and have to a large degree improved the condition of Wisconsin feeds; therefore, be it

Resolved, That this Wisconsin State Dairymen's Association here assembled at Barron, Wis., does hereby recommend to the present Legislature now assembled, that they use their influence and vote to maintain the laws as they now appear on our Statute books.

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.

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 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, adul-

terated, 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 sense of this convention that the Wisconsin Dairymen's Association is warranted in using a large portion of its annual appropriation for the purpose of organizing self-supporting cow test associations.

Resolved, That the thanks of this Association are hereby extended to President F. H. Scribner, for his most excellent services to the Association for the past year and also in regard to the work he has done in issuing the Directory of the Wisconsin Live Stock Breeders' Association.

Resolved, That the thanks of this Association are hereby extended to Secretary A. J. Glover, for his faithful, very efficient and enthusiastic services as secretary of this Association.

Resolved, That the thanks of this Association are hereby extended to the officers, speakers and all others who have assisted by their presence and activities in making this a most successful meeting.

Resolved, That we have met with a severe loss in the absence of ex-Gov. W. D. Hoard from this meeting; and be it further *Resolved,* That it is the sincere wish of this Association, individually and collectively, that he may speedily be restored to complete health and perfect vigor.

Resolved, That we have been well received and entertained by the people of Barron and vicinity; that the local committees have been diligent and painstaking in preparing for this convention; 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 Barron unsurpassed; we appreciate everything.

J. T. ATWATER,
U. S. BAER,
RAY N. WEST.

DISCUSSION ON MR. GOODRICH'S ADDRESS.

Mr. Goodrich: There is one thing I want to tell you, because some of you have asked me, and that is what kind of feed is the best.

Now, a cow needs a certain amount of protein to produce milk, from one and a third to two and a half pounds each day, according to what she does; then a certain amount of carbohydrates, making what we call a balanced ration. So if she does not get enough of the protein in one kind of feed, she must have it in another. If she hasn't it in one kind, we want to have our carbohydrates in another kind of feed. A man often asks what is the best kind of grain to give a cow to make her give milk. I will tell a little instance to illustrate that. One time in a Farmers' Institute a man asked, "What is the best kind of grain to feed cows to make them give milk?" I said, "I don't know." He says, "Are you joking?" "No, sir, I am in earnest, I don't know." "Well," he says, "you are talking about feeding cows all over the country and now you say you don't know. What makes you say that?" "Because I don't know what your coarse fodder is that this grain is to be fed with," and I went on and explained the best I could. Right after the meeting I saw a couple of men in a discussion. They happened to be men that I knew; one's name was Horace and the other was Ole. Horace was ready to jab a pin into me any time he could get a chance, and so as I was coming along he talked up loudly: "Perry says he don't know what kind of grain to feed cows to make them give the most milk. They better keep him home and send me out, I can tell." I came up to them, and I said, "Horace, what is the best kind of grain to make a cow give milk?" And he says, "Corn meal is best." Now, it was true that he got the biggest returns from cows of any one that was patronizing that creamery, and Ole was his close second, getting the next best. I said, "That is what you feed, Horace." "Yes." "No other kind of grain?" "No other kind of grain." "How much do you feed a day?" and he answered about eight pounds. "What do you feed with it?" and he said, "You know I have got alfalfa, don't you?" "Yes." "Well, I feed alfalfa hay and corn meal and some

other feed to make a variety, but that is the main feed.'' Don't you see he simply meant he was feeding a well balanced ration. Alfalfa has 11 per cent digestible protein; he probably fed about 15 to 20 lbs. a day and the cow didn't need much more, but it wanted lots of carbohydrates and the corn furnished 7 or 8 per cent carbohydrates. Well, when he said that I heard Ole say, ''Horace, I don't believe what you say. I was feeding ten pounds buckwheat middlings a day and I changed onto corn and my cows went right down and they were going to dry up.'' So they got to disputing and I don't know but they might have fought but I didn't want that, so I said, ''Now, Ole, what is it you feed with your buckwheat middlings?'' ''I feed timothy hay, I don't cut it as green as some folks.'' Now, timothy hay such as that has a little more than two and a half per cent digestible protein and buckwheat middlings has 22 per cent, so he fed a well balanced ration.

Corn meal is the best grain in the world to feed with plenty of alfalfa hay, or some other feed that has the protein in it, and timothy hay was all right to go with the buckwheat middlings, so when you are talking about the best kind of grain to feed, you have to figure on how much protein there is in the coarse fodder.

A Member: What is the difference between the feeding value of alfalfa hay and medium red clover?

Mr. Goodrich: The best kind of red clover has about 8 per cent digestible protein, and alfalfa hay has ordinarily 11 per cent and sometimes a little more. If clover hay is not cut pretty green, when it is in full blossom, it won't have so much as 8 per cent.

The Member: Well ,the sooner you cut this red clover, the less protein you have in it.

Mr. Goodrich: No, the more per cent of protein. You know pasture grass is a well balanced ration. Timothy grass when it is just growing up, has plenty of protein in it, but as it matures it has a great deal less.

A Member: Is not gluten meal cheaper to feed to the dairy cow than corn meal and give good results?

Mr. Goodrich: No, it won't give good returns, if you have enough protein without it. It has about 20 per cent digestible protein in it, and if you were feeding corn stalks and timothy

hay, gluten feed would be worth a great deal more than corn, but if you are feeding alfalfa hay, or feeding some other kind of grain feed that gives you protein, why, then you may not have use for the gluten feed. Gluten feed is deficient in ash. which is a great help.

A Member: What percentage of protein is there in alsike clover?

Mr. Goodrich: It is about the same as red clover, but a little better.

A Member: How are oats and barley with alfalfa?

Mr. Goodrich: They will do very well to go with alfalfa or clover hay. Clover hay and oats make an excellent ration. Barley contains a little more carbohydrates, and it would help it to put in a little bran.

RELATIONS OF CREAMERY SECRETARY AND MANAGER TO THE PATRONS.

WM. J. BRENNEN, Tomah, Wis.

Mr. President—Fellow Dairymen:

On being asked by your Secretary, Mr. Glover, to take part in this program I was very much, though agreeably, surprised. At first I thought Iwould have to decline on account of having already accepted a part on the buttermakers' program which would take place on the same dates.

But the more I thought of it the more memory recalled the great benefits derived by the patrons of the Tomah Creamery on account of the meeting of the Dairymen's Association with us a few winters ago.

On closer study I almost felt in duty bound to come here to hear the dairy interests discussed by the leading dairymen of the State that I might learn something new and take back with me to our patrons and put into practice the good thoughts and suggestions so derived.

No special fitness or ability of mine (if I have any) would bring me here to give advice or theories. So the few thoughts

brought out in this paper will be from practical experience among almost 400 intelligent creamery patrons, the majority of whom are making a small profit but trying each year to do a little better.

To begin with, the manager should be an active, practical dairyman, or one who has been, formerly, a successful keeper of dairy cows. Otherwise he will be working along theoretical lines and will not understand the conflicting conditions that exist on the average patron's farm.

To be a help to anyone else, one must first thoroughly understand what he is talking about. Were I to seek advice along dairy lines, I would rather go to the man who made a success out of failure rather than he who was invariably successful.

The ever successful dairyman is often enthusiastic and one-sided, and knows nothing, or very little, about the stumbling blocks and pitfalls that the majority of us have to go through to make a success of the dairy business. The man who has failed through bad judgment on his own part and then succeeded in the same line of business can give advice, free from any enthusiastic alloy, conservative and solid.

I believe nine out of every ten dairymen in the past have some time in their career been brought face to face with the glaring proposition that they were loosing money or barely breaking even. While hundreds of other keepers of cows (we won't call them dairymen) have been content to keep milking scrubs or "dual-purpose" cows not knowing whether they were making money or not.

I will not say a word for or against any breed; each has its place except the scrub which should have no place outside the canning factory and were the truth actually known insofar as profit producers, at least 20 per cent of Wisconsin cows should be canned immediately.

About the first question I put to a patron who complains of his cows not making anything is this: What type or breed of cows are you keeping? He may answer you this way: "Oh, my cows are all right, big, fat and sleek. Was offered $50.00 apiece last June when they freshened, and I guess the cow buyer knows good cows."

Be careful before you ask him the second question: What are you feeding them? Better let him talk for twenty minutes

before you say much. for he is the toughest proposition to successfully approach, that any manager has to contend with. First, gain his confidence, if possible, and convince him that the creamery is not stealing from him. This may take a year's time, but what of it. At the beginning of the second year he may be thinking of getting a half breed dairy sire. Discourage this if you can by showing him what a pure bred dairy sire has done for some neighboring patron of his. He may still think that the other fellow is getting some of his money but you may have created a doubt at least in his mind that the fault lies in his so-called $50.00 cows that produce $40.00 worth of fat annually.

After such a patron has gotten some kind of a dairy sire or some grade dairy heifers. you may approach him with the second question. What are you feeding them? And a hundred to one you will find if he feeds anything at all besides timothy hay, it will be a little barley or corn meal, knowing nothing about a balanced ration. calling such things "Madisonian ideas" or "book dairying."

Such patrons to whom I have just referred are the extremes, but each dairy community has them and quite a few of them, too. But they are constantly decreasing n number. either seeing the folly of their dairy methods and adopting better ones or become disgruntled and go out of the dairy business because they thought the creamery was not giving them a square deal.

I sometimes wonder whether it would not be just as well to let such patrons find their own way and spend your time working with the rest of your patrons who form the vast majority and who are ever ready to adopt better methods when shown that their profits can be increased thereby.

On the other hand, we have patrons who know and admit that their cows are no good but still go on year after year without any special endeavor to better their conditions. They have fossilized and about the only way to arouse them from their lethargy is through their sons who quite often will see some profits in good dairy methods and become enthusiastic dairymen.

When the patrons have taken the first step in dairying by adopting some dairy breed of their choice, then the great ques-

tion arises, how to get the patrons to produce the greatest amount of milk or butter fat at the least possible cost.

Many of us, though we may have good dairy cows, fail to make a profit on account of not knowing how to mix our feeds to make a balanced ration or not knowing what a balanced ration is. The manager should study and know how to figure out the cheapest balanced ration. This "cheapest balanced ration" will not remain constant on account of the fluctuations in price of the ingredients which constitute it. Hardly a week passes without the manager being asked by some patron how much and what concentrates to feed his cows. Have him enumerate what grains he has and if a balanced ration can be figured out which will be as cheap as its purchased equivalent, all right. But it is quite hard to get protein enough from out common grains without feeding too much carbohydrates and fat which is wasteful. Suggest to the patron to sell the oats that he is feeding and purchase bran and oil meal or some other feeds rich in protein as a substitute. Show him by actual dollars and cents what he will save by selling his 45c oats and purchasing bran, $21.00 per ton, and oil meal, $31.00, or other feeds containing a high percentage of protein. Get the proper amount of protein and, generally speaking, the fats and carbohydrates will take care of themselves. Now, a person does not need to be an expert on feeds and feeding to do this. Neither does he have to remember the analysis of each grain, for we have the charts already figured out for us and all that is necessary is to know how to make the proper combinations.

A great number of our patrons have already learned to make the combinations from their dairy literature or from some other source but they are in the minority.

I do not believe that there is any person connected with creamery work who has so wide a field of action for helping the patron as the manager of a creamery. The manager who figures out the pay roll and knows how many cows each patron milks, occupies a position that no other person does (except the owner) of knowing about what each herd is doing. Time and time again have I stopped and wondered what some patrons are milking for; sending cream in the summer months and little or none in the winter when butter is light. The average returns per cow from their herds is about $35.00 or scarcely

enough to cover the cost of feed. And these are the patrons who are always complaining that the dairy business does not pay. We will find about 20 per cent of these patrons in the majority of creameries of the present time. Is there any possilble way of reaching this class of patrons? We will admit the difficulty of it. And even when one of them is reached, the transformation is so very slow. Ask him to join a testing association, and he will throw up his hands or shake his head. Others will say, "I will join the association just as soon as I can get rid of my old skates of cows and get a dairy breed." Several of our patrons have expressed this to me and you don't know how good I felt after waiting for this expression for one or two years.

Get just as many of the patrons as possible to keep a private record of their herds by weighing and sampling the milk, for a private record is the very best record that any dairyman can keep. It teaches him to be a liberal, but judicious feeder. When he does this work himself, it teaches him to think and keep on thinking and not satisfied with his lot, he sees wherein he is far below the average production of the good dairymen of his neighborhood who perhaps have been keeping private records for years.

However, the number of ordinary patrons who keep a private record are so few compared with those who do not keep any record at all that we must use some other method to reach the great majority.

This brings me to the point where the Dairymen's Association has wisely come to our aid by sending men into dairy communities to establish co-operative cow testing associations. The good that these associations are now doing is very great, even though in their infancy. And it's up to every creamery manager to do all in his power to help establish and show to the patrons the benefits derived from the cow testing associations. Show the skeptical one who thinks it a "graft to get some friend a job" that no one is benefited except the individual cow owner. Show him, though his herd taken collectively may be paying him a fair profit, that he may and undoubtedly has some individuals who do not pay their board.

Let me cite an instance from my own herd. For a few years

we weighed our milk day after day collectively, and sampled and tested each individual so we knew about the average test of each cow but did not know the total amount of milk given by each cow. We knew that the herd taken collectively (I don't like the word) was paying a fair profit. Then came Mr. Searles and his new fangled individual "Cow Testing Association." We kept an individual record, and lo and behold! what a flood of light was thrown on our collective minds; some individuals going well above 300 pounds of fat, and two falling below 200 pounds of fat. and these later were mature cows in their prime. One of them we purchased as a heifer 5 years ago for $25.00 (a big price), milked and stabled her for nothing for a period of years, but we have not got her now, thanks to the Cow Testing Association.

If we could but make the patrons of our creameries see the benefits of keeping individual records, it would not be long before all the patrons would be doing so, except the knockers and chronic kickers and perhaps they might be induced to move over into Michigan or Minnesota.

So, secretaries and managers of creameries, let us be up and doing before the other fellows get the start of us.

We can get them all to see as we do. Reforms in the dairy business, like politics, can't be revolutionized in a day, a month or a year. But systematic work along better lines will bear abundant fruit as the years go by.

What else can we do as secretaries to help the patron?

Show me the patron who has systematically been a reader of good literature for a period of years and I will show you a profit-making dairyman. On the other hand, let us visit the unsuccessful patron, with his scrubby cows. dirty unventilated stable, unsanitary milk, and filthy cream, and nine times out of the ten, he does not read a dairy paper at all. He never heard of a Colantha 4th's Johanna. a Jacoba Irene, a Yeksa Sunbeam, a Rena Ross, or a Loretta D.

Ask him what those names signified and he would be apt to tell you they were fast horses, chorus girls, or some grand old dames of Colonial times.

Tell him that they were cows that hold yearly records from 643 to 998 pounds of fat and he will laugh you to scorn. Place a dairy bulletin in his hands and he willl throw it aside and call

it "Madisonian." If he does, put another one just like it in his hands as soon as possible. After a while he may read it, and "after a while" he may find his cows have tuberculosis.

Oh, what a field for missionary work. And no one stands in a better position to help than the secretaries and managers of creameries. We stand in commanding positions with the field of campaign radiating in all directions from us. And we fail in our duty to patrons if we let a single opportunity to help go by without rendering assistance where we can.

Let us begin when we go home, if we have not already begun, to induce our patrons to subscribe for some good dairy paper and gather together the best dairy bulletins obtainable and place them in their hands. Of course a great number of patrons already are well versed along dairy lines. I speak only of those who are either careless or skeptical and have not access to any dairy literature or will not make any effort to obtain any.

Let us now consider for a moment the relations of the secretary and manager to the patrons in a business way.

To begin with, a manager should be broad minded, liberal, conservative and progressive. One who can stand criticism without being peevish or trying to retaliate, flattery without being carried away, success without thinking that he is the only one on earth who has been successful. Always keep in mind that there are others in our communities who can do just as well or a little better in our positions than we are doing.

It is no place for a narrow minded man, one who is always looking for trouble or insults. He should be successful in his own business affairs before trying to manage a business perhaps 50 times as large for some one else. Use all the ability and business training at your command to make every penny possible for the patrons, and get them to help you.

How often do we hear that we farmers are the hardest men in the world to get along together. I don't believe it. Experience has shown that the dairy farmer, when given a square deal, is the easiest and most intelligent man on earth to get along with. When I hear of a manager who is everlastingly quarreling with and complaining of the patrons, I know that the manager and not the patrons is to blame.

He either lacks business ability to properly manage the creamery, or some defective scheme in his business management he

has failed to correct by which he can render a true accounting to the patrons.

There are none of us above criticism, and all of us are subject to errors in judgment. Let our business conduct be so that we can and do command respect from the patrons. Unless we have the confidence of our patrons, we cannot get them to work with us.

Become acquainted with and study the conditions of each patron as far as possible. What a field for action and food for thought. Three or four hundred different individuals, each a little different in character, but all good fellows together. When we have gained their confidence then we have nothing to fear when we ask them to help us to make a little better grade of butter to command a little better price.

Begin the work of educating the patrons to furnish a high standard of cream at the initial and most essential point, the stable where the milk is produced. I care not whether the cow is tied to a pole or placed in our most modern sanitary stalls if she is kept clean. But clean she must be kept to get a high quality of cream.

Keep tab on the modern barns and stables being built in your vicinity and try to persuade those who don't know any better the value of sanitary floors and thorough ventilation and some form of tie to keep the cow clean.

Another point I wish to bring out, in regard to testing, we will assume that it is properly done. But frequently patrons are dissatisfied and can't understand why the test is so low or why it varies so. We can explain and expound and offer causes and theories until we are black in the face with little effect. Give this dissatisfied patron a cream sample jar and a tablet and let him take a composite sample of his cream, and you also take one at the creamery for the same period of time. Give him instructions how to take the sample and let the manager test his cream sample in the patron's presence. Seldom, if ever, do the two samples so taken vary but slightly and you send away a better satisfied patron and a friend.

Do away with this old idea that the manager is always right and the patron always wrong. Both are subject to errors. Don't try to force your ideas onto them, they have rights as

well as you. Let us keep our eyes and ears open, for the patrons can teach us many things we did not know before.

Just a word in closing. Let us as managers use every means in our power to get a high grade of cream. Keep a first class buttermaker and give him modern machinery to work with. Then see that the buttermaker makes the greatest number of pounds of butter possible from the butterfat, keeping within the law and without sacrificing quality. And positively be able to use the test for moisture and butterfat so you may know at all times that the normal overrun is maintained without cutting the test.

Then use every fiber of your business ability to get just as much for the manufactured product as possible. Run the business just as economically as if it were your own private business. Give the patrons every penny that rightfully belongs to them. Place a monthly statement of the business done in the creamery where the patrons can see and study it if they wish to. And at the close of the year make an itemized report to each patron a few days before the annual meeting so the patrons may have a chance to study it over.

And lastly be fair to the patrons, the employees and to yourself.

I thank you.

DISCUSSION.

Mr. Goodrich: Do you have any trouble with the patrons having poor cream?

Mr. Brennen: We do.

Mr. Goodrich: And what do you do with that poor cream?

Mr. Brennen: We send it back, and tell them what the trouble is.

A Member: It is often because they do not take care of their separators.

Mr. Brennen: Very often agents try to induce people to buy separators, and tell people it is not very much trouble to keep them clean. A great many people think they only need

to be washed once in three or four days, but the right way is to clean it every time it is used.

A Member: Do you take any cream from these water separators?

Mr. Brennen: Three or four years ago we had several patrons that had cold water separators; they had them because they were unable to pay $100 for another separator. When we find a patron in that condition, we tell him to do the best he can until he feels able to pay the price of a modern separator. We have four hundred patrons, and I don't think we have but two or three that use the cold water separator, but we never refuse their cream, although sometimes it is not quite as good as the average. You can't get as good a grade of cream from those separators. There are some kinds where the milk and water is not mixed. If you get those, you get a little better quality of cream than the other way, because if you have contaminated water mixed with your cream, it is a pretty difficult proposition to get good cream out of it.

A Member: How can you tell who sends poor cream and who sends good cream on your cream routes?

Mr. Brennen: I advocated at Eau Claire, the other day, to do away with the cream routes. As long as we have routes we will have trouble, unless we have the same man day after day to keep tab on the cream hauler. The cream hauler is not generally as careful as he should be. One man will have a poor batch of cream, and the next will be good, to be dumped right in with that, and it is a tough proposition. The tendency of the time seems to be getting further away from that branching out. A better policy would be to get as good cream as possible and have it delivered in individual cans.

A Member: It would be pretty hard to do that if you had large routes.

Mr. Brennen: Our patrons and others join together, and in that way they make a trip three times a week in the summer which brings it around every two weeks. We have four cream routes and five per cent of that is delivered in individual cans, and it is better than that delivered in barrels. If we had it all delivered in cream barrels, we wouldn't be able to make as high a grade of butter as we do now.

Mr. Glover: You do not seem to be so much in favor of dis-

posing of the cream route as to have the cream delivered in individual packages. It is an economical thing to have cream brought in, in individual cans.

Mr. Brennen: In our system we make the individual pay for the hauling. It is deducted from his cream check. It is delivered twice a week in the winter and every day in the summer. The cream should be produced closer to the creamery, and it is not necessary to get a territory thirty miles in diameter. You would not have a creamery large enough and would have to have two large creameries. When the cream is delivered in individual cans, we get it in early; the individual has to be there at 12 o'clock, or before, and that gives the buttermaker a chance in the afternoon to handle his cream. Out on long cream routes, they come in at all hours. We have a system which says they shall be in at four o'clock, but some days that is not possible. You will agree with me that cream that is hauled all around the route is not as good as that which is taken from the farm directly, hauled in the morning.

A Member: Have you ever tried using ice on the route?

Mr. Brennen: We did. once or twice, yes.

The Member: I am an operator of a creamery; we are running four milk routes and we use ice on the route, and we find that we can haul thirty miles. We have to put the ice right in the cream, so if there is any contamination, I don't know. The statement was made by one of the Minnesota State Inspectors that cream run through a dirty separator that has stood over night contains more germs than water in the sewerage of the city of St. Paul or Minneapolis.

THE SILO.

By Roy M. Scribner, Rosendale, Wis.

I think that every one will acknowledge that there is no other factor so important in the development of an animal as the feed question. For, no matter how extended a pedigree may be, if the feed part is neglected, scrub results will be obtained. A careful, watchful feeder will do more towards bringing up to a standard of higher production than one who may have better bred animals and is a careless, ignorant feeder.

Wisconsin has become the leading livestock state on account of her natural adaptability and natural conditions, coupled with men who have made the feeding problem a study and have found that palatable and easily digested feeds are a very important factor in getting results from our dairy cows.

If we could have June grass and June conditions the year round, nothing better could be found; but as the climate of Wisconsin does not produce this condition of affairs, we have to try and make a substitute for these conditions.

Why is it that grass produces such results? Simply because it is palatable, succulent and easily digested. A little later, the grass gets dry and the cows shrink in their flow of milk, just because the grass is less digestible. Carrying this idea to the corn crop, which, by the way, is the most valuable crop we raise because of the large amount of tonnage to the acre, we find to get the best results the corn must be harvested when in the most succulent and easily digested stage. Then comes the question how to hold and keep it in this condition. For this purpose the silo has been invented and through its means the cows are made to produce a maximum yield at a minimum cost.

The greatest long distance cow in the world whose picture and record we find on our program, "Jacoba Irene", never would have accomplished what she did unless she had been fed good ensilage.

It is also a fact that in the different cow censuses, it is found that farmers having silos were getting the largest returns from

their cows, which shows that Wisconsin farmers are further advanced than the Indiana man who asked "What is this ensilage? Is it raised from the seed? And where can I get the seed?

A larger amount of stock to the acre can be kept profitably and a larger growth and better development of the young stock made with silage. The leafy part of the silage is given the calves and grain fed with it. In constructing the silo, care should be taken not to have it too wide, but it should have a reasonable amount of depth. I know of a case where the silo is 32 ft. long and 16 ft. high. The consequence of this kind of construction was that there was not sufficient weight to make much pressure and poor ensilage was the result.

A very good rule in building is: The width should correspond with the size of the herd and the height with the number of days that you wish to feed. The average silo is 16 ft. in diameter and 30 ft. high. It is not advisable to build a silo less than 10 ft. in diameter and 25 ft. high. The materials at hand may control the construction; stone, brick, concrete, cement blocks, and wood, all are good.

Where surface water does not interfere, it is advisable to go into the ground for 6 or 8 feet below the stable floor. This makes the cheapest part of the silo and the silage is best as it is in the ground where it is cool and less circulation of air.

These first few feet may be walled with stone, or concrete, and then cemented smoothly on the inside. A silo for Northern Wisconsin should be built warmly, as feeding frozen ensilage is injurious and the inconvenience in getting it out is quite an item.

The first requisite is to have the silo air tight. In the Christenson style of brick silo and the cement block style, as well as some of the wooden kinds, there are two air tight walls, thus making a dead air chamber between. This dead air space prevents to a large extent the freezing of the ensilage. This freezing can be largely controlled by the manner of taking out the ensilage. If the surface is not kept level and solid and is allowed to be higher at the sides it will freeze and stick to the wall and if allowed to do this constantly will freeze almost to the center during extended cold weather.

In the brick and concrete styles, the walls should be reinforced in some way. The reinforcing can be heavy wire or barb wire twisted, and I might state incidentally that this is the best place for a barb wire fence anyway. This wire should be placed nearer the outside of the wall which will give the wall greater strength. The reinforcing should be put more often at the bottom because of the greater pressure there and as we go nearer the top, the reinforcement can be further apart.

The continuous door circular silo is acknowledged to be the best. The sides of this continuous door should be securely held by rods imbedded firmly in the silo wall to prevent walls spreading. These rods can be used for holding the doors and as a ladder for getting to the top of the silo.

A concrete silo can be built entirely by anyone without hiring expert help. Good gravel and cement and a knowledge of the proper proportions to mix is all that is needed.

The location of the silo should be well considered; it should be placed where most convenient to feed. When once built, unlike a barn which can be moved or turned around, the silo is a permanent institution. I have in mind one of the first silos I ever saw. It was built 8 or 10 rods from the barn, and silage had to be hauled with team whenever needed.

The kind of corn to grow is the largest that will mature in your locality. Our first experience with silage over 20 years ago, nearly drove us out of the business, for we were told that almost any corn would do, so we planted the large ensilage corn which never got into the roasting stage. The consequence was the silage was sour and we had trouble all the way through. Later on we found that to have good ensilage, the corn should be matured to where the ears have begun to harden and well out of that milky stage.

Where trouble has been experienced with silage tainted milk or cream, it has been through carelessness. Either the silo has not been air tight causing some to spoil, or carelessness in getting it out by loosening up too deeply, throwing out more than needed for the day's use, being slovenly about scattering along feed alleys, careless about getting the hands soiled and tainted, and then milking without washing the hands, and last but not least, improper or inadequate ventilation of the stable. Where these conditions are seen to and remedied, it matters little

whether you feed before milking or after. It has been our practice to milk while the cows are eating, and as our business has been the furnishing of cream for the city trade, in all our 25 years' experience, we have yet to hear of one complaint.

The silo is coming more and more into use for summer feeding, and the wise dairyman is looking out for this. To make a profit out of the cows, they must be kept busy and not allow those shrinkage periods which are so common in summer and early fall; this also lightens up the pasture and makes it possible to carry a larger number of stock on small acreage.

Within a radius of two miles of our farm, there are 17 silos and it is a conceded fact that Wisconsin has the largest number of silos of any state in the Union.

One thing should be remembered in putting up a silo, and that is, it pays to put up a good one. Too many men have had poor success with silage because they have neglected this fact.

DISCUSSION.

A Member: I was talking with a man that came to my place about building a silo and there was a man with him from Iowa and he says, "Oh, you don't want a silo. Lots of farmers were building them twenty years ago, but now men that keep cows don't have them." I was surprised after reading our farm bulletins and Hoard's Dairyman and the Wisconsin Agriculturist so long, that a man should come from there and say they were doing away with them. I couldn't understand it.

The Chairman: Those people may be furnishing milk for the Borden factories, and they will not take milk from ensilage fed cows.

A Member: He said it was shipped mostly into the city of Chicago.

The Chairman: There will be no objection to it if it is shipped to Chicago. In the early history of the silo in Wisconsin we recommended that almost anything would do to use for a silo, and many were put up under those conditions and the result was failure in many cases.

Mr. Rather: How would you put up a stave silo, so as to have air spaces as you strongly recommend?

Mr. Scribner: You would have to build it with what they call "boxing." I have not observed stave silos so much, but I know of several where they feed out before the ensilage has a chance to spoil. They have more than one silo and they feed out of the stave silo first.

Mr. Rather: Down in our neighborhood the stave silo makes the finest silage of all the silos around. Even if the silage is frozen you can feed it. It will be frozen around the outside, but it thaws out and there is no harm done. That is my experience.

A Member: How deep, for practical purposes, may a silo be from the top to the bottom, and also how deep is it practical to put a silo into the ground?

Mr. Scribner: For practical purposes, it may be as deep as thirty or thirty-five feet from the top to the bottom of the building. The convenience in getting out from a distance below the stable floor is generally conceded to be confined to about six or eight feet.

Mr. Rather: You can go as deep as you have drainage, and you don't want to go any deeper; that is, where you have drainage for the surface water. There are quite a lot of silos built on the side of a hill and they couldn't put them very deep.

The Chairman: We are practically into the ground fifteen feet; but below the stable floor, it is only seven feet.

Mr. Rather: In last week's Hoard's Dairyman, there was an article written by a man who condemned the cement silo, and he said a large number were doing away with the cement silo and using stave silos.

The Chairman: There is no reason why silage will not keep as well in a cement silo as in a stave silo. We have had a cement silo six years.

Mr. Rather: How long will a stave silo last?

The Chairman: Until they are rotted out and that depends on the quality of the wood and other conditions.

Mr. Rather: The statement was made that either the silage would get slimy and sour or else it would burn next the cement.

Mr. Scribner: That has not been our experience.

A Member: Will a silo pay for six or eight cows?

The Chairman: Yes, it will, because if you have a silo and you have six or eight cows, you will find that you can keep more cows with a silo. I have in mind a young man that put up a silo for eight cows, and he told me last year that before he put up the silo, the best he could get out of his cows was $50 a year from the cream, but after he put up his silo, he was able to get $75 a cow, and that brought him in $200, and his silo cost him $100. He said if he had to put up one every year, he would do so. He built one all of stone, from top to bottom, for $100. It was twelve by thirty.

Mr. Rather: What was it made of, hardheads?

The Chairman: The hardest kind of hardheads. He did most of the work himself.

A Member: What harm will the drainage of water do to a silo that is made entirely of cement from top to bottom and well built at the bottom, so that the drainage water cannot get inside?

Mr. Scribner: I should think if it was as well constructed outside as it is inside, it would hold the water out as well as it holds the juice of the silage.

The Chairman: A concrete silo would probably hold the water out, but an ordinary wall painted on the inside will not keep the surface water out.

A Member: A foundation built of water and concrete will keep water out.

Mr. Goodrich: I have a few figures that I want to read. In the course of my investigations, I have taken quite a good many cow censuses to tell what was fed and then what was returned. Where I took one cow census, there were forty-eight herds. I didn't select, I just went right out along the road and I put down what they fed, and when I came to look it over, I found that six fed silage and forty-two did not. Now, I wanted to compare and see whether they did as well without silage as they would do with it, and here I have the gross returns for those who fed silage, and it averaged $52.52 per cow. Some of them were good farmers, some not so good.

The gross returns of the forty-two who did not feed silage, averaged $34 per cow. The net profit above the cost of feed of the ensilage men was $21.02 per cow; of the others, $4 per cow. The gross receipts of the silage men was 54 per cent more

than the other, and the profits 500 per cent more, so it did certainly pay to build silos in that case.

The Chairman: It would look so, if you haven't lied about it.

A Member: How would clover be for silage?

The Chairman: Well, clover is all right; it can be used for silage, and it wants to be cut in with your feed cutter just the same as corn. We tried an experiment one year putting it in whole, just as we cut it from the field, and about one-third of what we put in was not good. We could not pack it so it would settle properly, but by cutting it in with a feed cutter it was all right.

A Member: Will a little stover do any harm?

The Chairman: No, it won't hurt.

A Member: Will it hurt to put it in with the dew on?

The Chairman: It doesn't make any difference. If there is any excess of moisture, the heat will take it up.

A Member: What is the cost of putting in corn silage.

The Chairman: About 50 cents a ton. That just includes the putting of the silage into the silo, not the value of the corn.

Mr. Goodrich: In charging up the feeds, in making these cow censuses, I figured silage at $2.50 a ton. But I tell you a man could do pretty well if he got ten tons to the acre, which is not a big yield, down as far as Fond du Lac County any way, and that is $25 per acre. The cost of harvesting is less than it would be to harvest corn the other way.

A Member: Will flint corn do better than dent here in Barron county?

The Chairman: Yes, if the dent doesn't get ripe; but if it does get ripe, you have more feed to the acre, more tons.

A Member: Should corn be cut right into the silo?

The Chairman: We cut and put right in.

Mr. Scribner: As I said in my paper, it should be just beyond the milk stage. In the dent corn, it should just begin to glaze over; that is just the right condition, the right stage for putting it into the silo for ensilage.

Mr. Goodrich: Now, that depends on how mature it is. If it was just getting into the roasting stage and you were afraid of the frost up here in this country, I should think it would be better to wait a little while and let the water dry out; but where the corn is mature I think that there isn't any too much moisture

in it. The rule is there should be about 70 per cent of water and 30 per cent of silage in it. Of course we cannot analyze it, but the stage that we have found the best to put it in, is when the lower leaves begin to turn and fall away, the corn is getting dented if it is dent corn, and when the earliest ears, the husks, are beginning to turn white. That is the stage that corn has the most nutriment in it, just the stage to cut it up and harvest for fodder, and also the right time to put it into the silo. If you have to cut it green for fear of frost, and there is a good deal of moisture in it I should think it would be better to have it dry out a little, because, as I have found, if you put it in so green it will be sour.

A Member: Do you add any water if there isn't moisture enough in it?

Mr. Goodrich: I have known a man to shock his corn because the silo was not ready and it got dried out. Sometimes, in such a case, it is a good thing to put in water, but where the fodder is just right you don't want to put in any water. But I will say, after you have it filled, you can put a good lot of water on it and it won't spoil. Gen. Burchard, the associate editor of Hoard's Dairyman, is pretty well posted on all things. He built a stave silo which was filled before the roof was on, and before the carpenter came to put on the roof, a very heavy rain fell. The General was worried about it; he thought it would hurt his silage. Probably three or four inches of water fell, and when they put on the roof, about two inches of silage had spoiled on top. Ever since then he puts on water and so do a good many others.

The Chairman: Do you use any covering for your ensilage?

Mr. Scribner: Yes, we do; it may be a covering of straw or marsh hay or we may sow on some oats, and the heat from the ensilage will make those oats grow and form a matted covering which keeps the top of the ensilage from spoiling.

The Chairman: Have you ever tried salt brine?

Mr. Scribner: Yes, we have with good results. Last year I tried a very strong solution of salt brine and not over three inches of our ensilage spoiled, and that was on the sides and in the center.

The Chairman: It wasn't over an inch and a half or two inches.

A Member: How much of that solution did you put on and what strength?

Mr. Scribner: I think our silo is sixteen feet in diameter, and I think I put on an eight-gallon can of salt brine.

Mr. Rather: A year ago last fall I read about this salt brine and I tried it. I put it on the same amount as you mention, thirty gallons of this solution strong enough to carry an egg. I was very much disappointed when I opened the silo, and I made the remark that I wished I had that brine man here. We haven't used any salt brine since.

A Member: How deep would your silo spoil where you covered with straw or marsh hay or oats.

Mr. Scribner: When we covered it with oats, the spoiled part was four or five inches at the most. I never have tried the straw or hay.

The Chairman: Something has got to spoil. It usually won't spoil much under cover.

Mr. Goodrich: Now, I am going to take issue with Mr. Scribner about that. He says something has got to spoil. I don't believe that necessarily. If you commence to feed right away after you get the silo filled you won't have a bit of it spoil.

The Chairman: I have filled a silo a good many times and I have fed from it a good many times, but I have found when we commenced to feed out of the silo before it has gone through that curing process, we wasted a lot of it as the cows didn't like it. Ensilage has to go through a curing process before it is ready.

Mr. Rather: Mr. Goodrich's advice may be all right, but I tried following it, and I had the same success that Mr. Scribner did.

Mr. Bradley: The gentleman spoke of building silos very small in the northern part of the state, that is, cement or brick silos. Wouldn't a cement silo freeze quicker and the silage stick to it more than to a stave silo if you couldn't keep out the frost?

Mr. Scribner: It certainly would, although it doesn't make much difference if you have an air space.

Mr. Bradley: Our stave silos may freeze some, but when we got a stone wall above the ground, twelve or fourteen inches, the silage froze much worse at this point than the stave silo,

and it stuck to it much worse, and my opinion was that the silage in the cement silo would stick and freeze to it worse than in the stave silo.

Mr. Rather: What kind of a cutter do you prefer?

The Chairman: A feed cutter.

Mr. Rather: A carrier or a blower?

Mr. Scribner: If my personal opinion were asked, I would prefer a blower.

Mr. Rather: My cutter was worn out. I used it for eighteen years with a carrier and I was obliged to buy another cutter, and the first machine I examined was the Ohio which had a blower on the flywheel. I found that all the kernels of corn were shelled from the ear before it came into the silo, and that was something that didn't suit me. I examined a smaller machine, built on pretty near the same principle, but the blower was independent from the machine, and I found you had to be very careful in running that machine without blocking the blower. The corn was shelled very bad, so I gave up the cylinder cutter-blower machines for my use. I examined and found one that would not shell the corn from the ear where the blower was attached to the flywheel right in back of the knife. There are a good many different machines, but you don't want to select a flywheel cutter with a straight knife. You want to select a flywheel cutter machine with a curved knife. I selected what they call the Tapec flywheel cutter machine. We bought the machine and took it on trial and the man said "If you can block that blower, you shall have that machine for a present," and I thought we were going to have it, but we haven't succeeded in doing it yet.

A Member: Mr. Goodrich explained this morning that the corn is separated after it gets inside of the cow. If the cow had a chance to pick that silage up without the ear it would save her the trouble of doing the separating. I have examined the silo inside and the corn comes into the silo separated from the other feed. The corn went on one pile and the rough part of the silage was around it. It kept a man busy to mix that feed. I have examined the silage when it was being fed and the boy said, "If we want corn for the chickens, we know where to go for it," and that is all the benefit I could see out of using that kind of a machine.

Mr. Bradley: In our neighborhood we have the cutter that

the gentleman just condemned, and we haven't found the trouble that he describes. If the corn goes into the silo on the ear will not your leaves separate from them just as readily as the corn that is removed from the cob?

Mr. Rather: No.

Mr. Bradley: We find it so. We used to have such machines before we used the blower but I like the blower. Ours is a small machine and I don't see that we have to be any more careful than in feeding with other machines. As to the leaves separating, I don't think they separated so badly as they did the year previous with the other machine.

A Member: About green corn souring, if you have a field of corn and the frost comes early and it freezes when it is right in the milk, would you put it in the silo at all, or would it become too sour?

Mr. Goodrich: Put it in the silo; you can get more good out of it than any other way.

A Member: Which is the most profitable crop to raise for the silo, green clover or corn?

Mr. Scribner: You get more silage to the acre in your corn crop than you will in your hay crop.

The Chairman: Isn't it necessary to give some dry feed with the ensilage?

Mr. Scribner: Yes; you have to make a balanced ration and your corn crop and your hay crop will be balancing that ration to a great extent.

The Chairman: Don't the cows crave for something dry if you undertake to feed them all ensilage?

Mr. Scribner: They certainly do. In some cases they will even eat the bedding from under their feet if they do not get enough roughage.

A Member: I wanted to know which would be the cheaper to raise, clover or corn for ensilage?

The Chairman: I think the corn would be the cheaper. If you put in clover, you want to cut it just as you would for hay at the same stage.

A Member: Is it necessary to feed out every year, or can you refill on top of the old?

Mr. Scribner: Yes. If there isn't any spoiled ensilage, you can go on and fill just the same as if there were no ensilage there. It doesn't make any difference if it is several years old.

The Chairman: I was in a silo a while ago where they were feeding eight-year-old ensilage and it was good ensilage, too.

A Member: Will hardwood lumber do for a silo?

Mr. Scribner: Not as well as pine or spruce.

Mr. Brennen: For twenty-five cows, how large a silo should be built?

Mr. Scribner: I should say not less than fourteen feet in diameter and about thirty feet deep. It costs just about $150 to build a cement silo. I mean a solid wall, of course.

A REPORT OF THE FORT ATKINSON COW TESTING ASSOCIATION.

By Ray N. West.

This association was organized October 15th, 1908, by the Wisconsin Dairymen's Association with the assistance of Mr. Helmer Rabild of the Dairy Division, Washington, D. C. The membership at the beginning was twenty-one, of which five withdrew before the end of the year, leaving sixteen herds to complete a full year's work. The association was organized on what we term the Dollar Plan, that is, each member paying $1.00 per cow per year for having the milk from each cow weighed and tested one day each month. From these weights and tests the yearly record was made. After the tester had finished his work with one herd he was carried by the owner to the next member's place and this was continued until he had visited all the members of the association.

Each member was provided with a book in which was kept a complete record of every cow. For the sake of identifying the animals, a rough sketch was made of each one and recorded on the page on which her record was kept. In this book the breed of the cow was given, her age, when fresh, milking period, pounds of milk produced each month together with the test, pounds of fat produced, gross returns, cost of feed, net profit, cost of one-hundred pounds milk, cost one pound butterfat, and returns for each $1.00 expended for feed. At the end of the year her record showed the amount of profit or loss she had given to her owner.

The roughages which the animal received were calculated upon the prices they could be sold for on the farm and the concentrates at market prices, which are as follows:

ROUGHAGES	Per ton
Silage	$2 50
Clover hay	8 00
Timothy hay	10 00
Mixed hay	9 00
Marsh hay	5.00 to 6 00
Corn stover	5 00
Corn fodder	10 00
Green corn fodder	1 50
Alfalfa hay	12 00

CONCENTRATES	Per ton
Corn and cob meal	$22 00
Dried brewers grains	27 00
Bran	22 00
Oil meal	35 00
Gluten feed	28 00
Barley	23 00
International sugar feed	25 00
Middlings	26 00
Cotton seed meal	30 00
Ajax Flakes	31 00
Badger feed	26 00
Sugarota	25 00
Malt sprouts	20 00

Pasture fifty cents to $1.00 per month, depending upon quality.

Since cow testing associations are governed by a set of by-laws which provides for a Board of Directors, the general details and management of the association were left entirely to these men. However, throughout the whole year, the Wisconsin Dairymen's Association co-operated with them and helped the cow tester in keeping the records and in other matters pertaining to the welfare of the association.

There were a few who became dissatisfied with the testing and withdrew from the association, but as they were bound by contract to pay so much money toward the support of this association, they did so without causing any vexation on the part of the officers. In making inquiry of each one of the members who withdrew from the association as to the reason why they were dissatisfied, I received in substance the following replies:

A: "I am expending all the money for feed that I can possibly spare and will have to let the testing of my cows go, until I have a better herd as I do not wish to inflict any greater loss upon myself this coming year." The owner of this herd had red and white cows bred to a bull which he supposed to be out of an A-1 cow, at any rate he says, "She gives a big mess of milk when fresh and always looks nice and fat." Note: This man had no definite measure as to the value of this

cow, "she gives a big mess of milk when fresh and looked nice and fat." It is plainly evident that he is not a dairyman.

B's reason for quitting was something like this, "When I sit down to a cow and milk her twice a day, I know just about how much she gives and if the milk has a nice rich color, I am reasonably sure that she is a good testing individual. By close observation I am satisfied I know what each one of my cows is doing." Isn't it strange that in this day and age when so much has been written upon the subject of dairying that any man can deceive himself into thinking that he could determine the richness of milk by its color. It was recently reported by the United States Government that buffalo milk is blue in color, but tests in many cases between 7% and 8%. If this man had studied the colors of the milks of the different breeds of cattle, he would know that judging milk by color is as ridiculous as attempting to estimate the weight of a pig in a bag. For example, Guernsey skimmilk is of a deeper shade of yellow than some whole milks of the other breeds of cattle.

C's reason for quitting the association was probably more justified than any member who withdrew. His wife could see no benefit in the test work and if he was to have any peace at home it became necessary for him to request the tester to pass his place. Comment upon this situation is unnecessary.

D claimed that one or two tests a year were all he cared for and he was not at all interested as to how much a cow returned for each dollar expended for feed. "All I care for," he says, "is what a cow produces and not what it costs to produce it." The real reason for D's withdrawal seemed to lie in the fact that he was not feeding his herd as he should, and they were not giving as good returns as he wished and did not care to have the results recorded. In other words, this man was one who disliked to know exactly what his cows were doing. He fully realized that his work was not profitable but did not have the courage to face the situation.

E found it necessary to withdraw from the association because the firm of which he was a partner had disposed of its place and he was obliged to move to another farm.

The work was very satisfactory to the members who remained through the year. When the association was reorganized several of the members expressed themselves very forcibly upon the value that they had received by knowing what their cows

were doing. One man said, "The money that I paid for having my cows tested was one of the best investments that I have made for years." Another member said, "There is no money that I take any more pleasure in paying out than that which goes toward paying for the work of finding out what each one of my cows is doing." Still another says, "It makes me more interested in my herd by knowing the cows individually and I find that my pet cow ranks as one of the poorest producers."

In reporting the different herds I give the records of the best and the poorest cows in the different herds and the average results of each herd. In calculating the results only cows with a full year's work were considered, that is, cows that were in the herd a whole year.

Herd No. 1 was composed of 16 Guernseys, two of which were registered. Only five cows completed the year's work, the balance being disposed of and others put in their places. Some of those sold were found to be making only a small profit, while others were of no particular breed, and the owner had a chance to purchase some Guernseys. A Guernsey sire was used. The cows were hardly in good milking condition and rather thin in flesh. The stable was well lighted, ventilated and whitewashed; conditions very sanitary.

The winter ration fed was composed of clover hay and corn stover *ad libitum*. For concentrates: Ajax Flakes 3½ lbs. and barley or corn (ground) 2 lbs. were given. In the spring the same roughage was given as in the winter with a grain mixture of International Sugar feed 5 parts; Ajax Flakes 8 parts, with about five lbs. to each cow. No grain was fed during the summer; pasture was woodland and marsh, half and half. In August they received some clover hay; in September and October, green fodder corn.

The following table gives the yearly record of the best and poorest cows and the average record of the herd:

	Best cow.	Poorest cow.	Average of herd.
Breed	Reg. Guernsey	Gr. Guernsey	Gr. G., Reg. G.
Age	9 years	7 years	
When fresh	Dec. 2, 1908	Fall of 1908	Early winter.
Milking period	10 months	12 months	Average 11 mos.
Milk, pounds	7,555	6,089.8	6,094.8
Fat, per cent	4.36	4.42	4.57
Fat, pounds	333.8	269.8	278.8
Gross returns	$112 86	$89 66	$92 57
Cost of feed	39 91	40 70	36 61
Net profit	78 21	48 96	55 86
Cost of 100 pounds of milk	52	67	595
Cost of 1 pound fat	12	15	13
Returns for $1 expended in feed	2 83	2 20	2.52

Herd No. 2 was composed of seventeen cows, Shorthorn and Holstein grades and one registered Holstein and a Holstein sire. Only fourteen completed a full year's work; the others were sold to the butcher. The cows are of good conformation and in fine condition. The barn was poorly lighted and had no ventilation.

The ration fed in winter of 1908 and 1909 was composed of corn stover, mixed hay (clover and timothy), marsh hay with a grain mixture of alfalfa meal 2 parts; bran, 1 part; corn, 1 part. From six to ten lbs. of this combination was fed daily. Pasture was on low ground, mostly wild grass. Some corn and cob meal was fed in June and July and marsh hay in fall.

The following table gives the yearly record of the best and poorest cows and the average record of the herd:

	Best cow.	Poorest cow.	Average of herd.
Breed	Gr. Guernsey	Gr. Holstein	Gr. S. & H.
Age	6 years	6 years	4 to 10 years.
When fresh	Oct. 25, 1908	June 18, 1909	Fall.
Milking period	12 months	10 months	Average 10 mos.
Milk, pounds	8,194.8	5,660.1	6,240.9
Fat, per cent	3.84	3.71	3.97
Fat, pounds	315.3	200.4	248.3
Gross returns	$104 38	$67 59	$83 74
Cost of feed	41 18	38 30	38 87
Net profit	63 20	29 29	44 87
Cost 100 pounds of milk	50	68	61
Cost, 1 pound fat	13	19	15
Returns for $1 expended in feed	2 53	1 77	2 19

Herd No. 3 was composed of fifteen high grade and registered Guernseys. A registered Guernsey sire was used. Cows were of good size and in excellent condition to make good returns for feed given, except for this reason. Abortion had been prevalent in the herd for the past year and a number of cows under test aborted. The barn was clean, well lighted, whitewashed and had an excellent system of ventilation.

The following ration was fed during the winter of 1908 and 1909: Silage 30 lbs., alfalfa 6 lbs., corn stover 6 lbs. For concentrates, 10 lbs. daily of Ajax Flakes and bran were given. Some cows received equal amounts of these feeds, while others two parts Ajax Flakes and one part bran. In the spring a grain mixture of equal parts of bran and Sugarota was given. The cows that freshened late in the winter were fed a light grain ration during the summer. Cows ran on a low blue grass pasture during the summer.

The following table gives the yearly record of the best and poorest cows and the average record of the herd:

	Best cow.	Poorest cow.	Average of herd.
Breed	Gr. Guernsey	Reg. Guernsey	Gr. and registered
Age	7 years	9 years	
When fresh	Dec. 29, 1908.	April 26, 1909	Fall.
Milking period	8½ months	10 months	Average 10 mos.
Milk, lbs	6,076	3,202	4,650
Fat, per cent	5.05	5.33	5.03
Fat, pounds	307.2	170.7	234.3
Gross returns	$101.57	$53.86	$77.59
Cost of feed	26.81	24.25	27.26
Net profit	74.76	29.61	50.33
Cost 100 pounds milk	.44	.757	.586
Cost 1 pound fat	.087	.22	.116
Returns for $1 expended in feed	3.78	1.42	2.84

Herd No. 4 had no particular breed of cows. The majority were natives and a few Holstein and Guernsey grades. A grade Guernsey sire was used. The cows, though thin in flesh, were healthy. Barn was clean and well lighted but had no system of ventilation.

The following ration was fed in the winter of 1908 and 1909: Corn fodder 10 lbs. (in November); marsh hay, *ad libitum;* clover chaff 8 lbs.; corn stover 20 lbs. (beginning in December). For concentrates: Badger feed in February, four lbs. per cow per day, Sugarota four lbs. in March, April and May. Otherwise no grain was fed. In summer the cows were on blue grass pasture. A limited amount of green fodder corn was fed in September.

The following table gives the yearly record of the best and poorest cows and the average record of the herd:

	Best cow.	Poorest cow.	Average of herd.
Breed	Native	Native	
Age	7 years	9 years	
When fresh	S pt. 2, 1909	Not within year.	
Milking period	10½ months	6 mo ths	Average 10 mo.
Milk, pounds	4,716	1,433	3,622
Fat, per cent	4.91	4.7	4.39
Fat, pounds	224.1	67.8	159.0
Gross returns	$71 14	$23 66	$52 80
Cost of feed	30 84	28 99	28 53
Net profit	44 30	—5 33	24 27
Cost 100 pounds milk	65	1 65	78
Cost, 1 pound fat	13	40	—18
Returns for $1 expended in feed	2 44	— 82	1 85

Herd No. 5 was composed of twenty-seven cows the majority of which were high grade Guernseys. Only twenty-two cows completed their year's test as some were found unprofitable and were disposed of to make room for profitable animals. The cows were in good milking condition, not fleshy but looked sleek and healthy. They were medium sized Guernseys and showed excellent milking qualities.

The following ration was fed during the winter of '08–'09: Corn silage, 25 lbs. per day (owner did not believe in feeding as much silage as some feeders do); clover hay 5 lbs., corn stover 5 lbs. For concentrates: bran and barley equal parts in November, December, and January, 8 lbs. per cow per day. In February and March, eight pounds of the following mixture was given daily: bran 1 part, International Sugar feed 1 part, corn meal 2 parts.

The pasture consisted of lowland blue grass but not enough for the number of cows pastured. In summer, clover, alfalfa, hay or silage was given. In September and October, green corn was fed.

The following table gives the yearly record of the best and poorest cows and the average record of the herd.

	Best cow.	Poorest cow.	Average of herd.
Breed	Guernsey	Guernsey	Guernsey.
Age			
When fresh	Nov. 15. 1908.	Last of Dec., 1908.	Fall.
Milking period	11 months	8 months	11 months.
Milk, pounds	8,585	3,409	5,547.5
Fat, per cent	4.6	5.4	4.8
Fat, pounds	407.1	182.8	268.1
Gross returns	$136.42	$61.98	$88.62
Cost of feed	44.12	36.73	37.92
Net profit	92.30	25.25	50.69
Cost 100 pounds milk	.47	1.08	.70
Cost 1 pound fat	.10	.20	.14
Returns for $1 expended in feed	3.09	1.69	2.60

Herd No. 6 was composed of one Holstein, four Guernsey grades and five native cows; a Holstein sire is used. The cows were very well kept considering the conditions which were not the best. The barn was rather old with no ventilation.

The following ration was fed during the winter of 1908 and 1909: Silage, average 30 lbs. per day; marsh hay, *ad libitum*, corn stover, 15 lbs. For concentrates, two pounds and a half a day of a mixture consisting of dried brewers grains 3 parts, bran 2 parts was given. Some Badger feed was fed in December and January instead of dried brewers grains. In summer they received no feed other than lowland pasture.

The following table gives the yearly record of the best and poorest cows and the average record of the herd:

	Best c w.	Poorest cow.	Average of herd.
Breed	Gr. Holstein	Gr. Guernsey	Gr. H. & G.
When fresh	Nov. 16, 1908	Nov. 17, 1908	Fall.
Milking period	8 months	9 months	10 months.
Milk, pounds	4,155	3,015	4,108.6
Fat, per cent	5.6	4.0	4.14
Fat, pounds	210.68	122.8	172.4
Gross returns	$71.11	$41.30	$57.23
Cost of feed	25.84	26.23	26.02
Net profit	45.27	15.07	31.22
Cost 100 pounds milk	.68	.87	.63
Cost 1 p und fat	.12	.21	.15
Returns for $1 expended in feed	2.75	1.57	2.20

Herd No. 7 was composed of twenty-five high-grade and registered Guernsey cows, all showing good size, conformation and breeding. Only fourteen cows of the herd completed a full year's work, as the owner was buying and selling continually, trying to improve his herd. A Guernsey sire was used. They were in good working condition, not fleshy, but looked healthy and well kept. The barn was clean, well lighted and ventilated.

The following ration was fed during the winter of 1908 and 1909: Silage average 35 lbs. per day, marsh hay, *ad libitum*, a little alfalfa and five lbs. corn stover. For concentrates, dried brewers grains, six pounds per day. In February and March two pounds corn and cob meal was fed with five pounds dried brewers grains per day. In April and May eight pounds per day of a grain mixture composed of three parts of corn cob meal and four parts of Sugarota was given. In June they received three pounds of corn meal per day; in July and August no grain; in September, silage. The pasture was blue grass and marsh grass nearly half and half.

The following table gives the yearly record of the best and poorest cows and the average record of the herd:

	Best cow.	Poorest cow.	Average of herd.
Breed	Guernsey	Reg. Guernsey	
When fresh	Nov. 25, 1908	Oct. 22, 1908	Fall.
Age		3 years	
Milking period	11 months	11 months	Average 10½ mos.
Milk, pounds	9,756	4,840	6,187.8
Fat, per cent	4.2	4.1	4.5
Fat, pounds	410.4	201.8	278.0
Gross returns	$137.57	$66.88	$92.27
Cost of feed	36.34	38.43	37.49
Net profit	101.23	28.45	54.78
Cost 100 pounds milk	.37	.79	.60
Cost 1 pound fat	.08	.19	.13
Returns for $1 expended in feed	3.78	1.74	2.46

Herd No. 8 was composed of eight very good cows, nearly alike in production. One cow was in the test only six months, taking the place of a Shorthorn that was disposed of after being tested eight months. The Shorthorn cow went dry eight months after freshening, although she made a fair profit while milking. There are in the herd now three Guernseys, two Holsteins, one Ayrshire, one Jersey and one Shorthorn grade. The stable was clean, quite well lighted, and a comfortable home for the cows. The cows of medium size, showed good care, were in very good condition, and showed a fairly well developed dairy type.

The following ration was fed during the winter of 1908 and 1909: Timothy hay, *ad libitum*, corn stover, 10 lbs.; alfalfa hay, 8 lbs. For concentrates, corn and cob meal, 2 lbs. and dried brewers grains (in November 2 lbs. and in January 1 lb.); bran 2 lbs.; International sugar feed, 1 lb. in March; in April 3 lbs. The pasture was low land. In August they received some alfalfa hay, in September and October green corn fodder, except latter part of October, then corn stover in the place of corn fodder.

The following table gives the yearly record of the best and poorest cows and the average record of the herd:

	Best cow.	Poorest cow.	Average of herd.
Breed	Grade Holstein.	Gr. Guernsey	
Age	5 years	8 years	
When fresh	Fall 1908	Jan. 28, 1909	
Milking period	12 months	9 months	Average 11 mos.
Milk, pounds	7,856	6,147	6,705.1
Fat, per cent	4.18	3 91	4.14
Fat, pounds	317.57	240.7	278
Gross returns	$105.13	$77.14	$91.52
Cost of feed	38.55	33 77	36.35
N. t profit	66.58	43.37	55.17
Cost 100 pounds milk	.49	.54	.54
Cost 1 pound fat	.12	.14	.13
Returns for $1 expended in feed	2.76	2.25	2.52

Herd No. 9 was composed of ten grade Guernseys of medium size. They were nearly all two or three-year-old heifers, three cows being over three years old. A grade Guernsey sire was used. The barn was warm but poorly lighted and ventilated.

The following ration was fed during the winter of '08–'09: Silage, clover hay, corn stover, and a limited amount of alfalfa. The fresh cows received a small feed of corn meal in February, otherwise no grain was fed. The pasture was blue grass. In August, September and October the cows received green fodder corn, also some mixed hay, clover or timothy.

The following table gives the yearly records of the best and poorest cows and the average record of the herd:

	Best cow.	Poorest cow.	Average of herd.
Breed	Gr. Guernsey	Gr. Guernsey	Gr. Guernsey.
Age	2 years	5 years	Young.
When fresh	Sept. 3, 1908	Not within year.	Fall.
Milking period	12 months	8 months	Average 9½ mos.
Milk, pounds	4,196	2,337.8	3,758
Fat, per cent	5.46	5.1	4.67
Fat, pounds	221.6	119.33	$174.30
Gross returns	$75.25	$40.20	56.05
Cost of feed	34.28	32.52	33.76
Net profit	38.97	7.68	22.28
Cost 100 pounds milk	.81	1.34	.89
Cost 1 pound fat	.15	.27	.19
Returns for $1 expended in feed	2.14	1.23	1.63

Herd No. 10 was composed of ten pure bred Holsteins and three high grade cows. A Holstein sire was used. These cows completed a full year's work while a number of others in the herd were in the test only six to eight months. The owner bought and sold a number of cows during the year in his endeavor to improve the productiveness of the herd as well as the breeding. This herd impressed a visitor with the idea that it had received very good care and attention and was further shown from an inspection of the barn, which was clean, well lighted and comfortable for the cows.

The following ration was fed during the winter of 1908 and 1909: Silage, 25 lbs. per day; alfalfa hay, small quantity; clover hay *ad libitum*. For concentrates: Barley three and one-half lbs. a day in December; five pounds of gluten meal and malt sprouts, equal parts for balance of winter and spring. The pasture is blue grass and marsh, nearly half and half. The cows that had been in only a short time, received from six to seven pounds of ground barley a day, while on pasture. During the last half of August and part of September, cows received green corn fodder with the pasture; in October, silage at the rate of 25 lbs. a day.

The following table gives the yearly record of the best and poorest cows and the average record of the herd:

	Best cow.	Poorest cow.	Average of herd.
Breed	Reg. Holstein	Reg. Holstein	
Age	5 years.	2 years	
When fresh	Fall	Fall	Fall.
Milking period	11 months	11 months	
Milk, pounds	8,911	3,910	7,114.7
Fat, per cent	3.47	4.2	3.6
Fat, pounds	309.6	164.5	258.8
Gross returns	$102.79	$55.51	$86.78
Cost of feed	50.63	43.91	50.34
Net profit	52.16	11.60	36.44
Cost 100 pounds milk	.57	1.12	.77
Cost 1 pound fat	.16	.26	.19
Returns for $1 expended in feed	2.03	1.26	1.72

Herd No. 11 showed the gratification for the extra care and attention given by their owner in their returns for the feed, with a number of grades showing the following lines of breeding. There were seven pure bred Guernseys, three Jerseys, five Guernseys, two Ayrshires, three Holsteins, three Shorthorns and a pure bred Guernsey sire.

The barn was clean, well lighted and ventilated and the cows seemed to have everything necessary for their comfort. The following ration was fed during the winter of 1908 and 1909: Silage, (30 lbs. per day), alfalfa hay (a small amount), clover and timothy or corn stover. For concentrates, bran and barley, and in January, February and March two pounds of Ajax Flakes were added to the ration. The cows received one pound of grain for every three pounds of milk, some cows receiving no barley meal. The only grain fed in the summer was a pound of bran a day in July and August. Their pasture consisted of blue grass and marsh hay in nearly equal proportions and also received from eight to twelve pounds of silage a day all summer. In October clover and timothy hay was given.

The following table gives the yearly record for the best and poorest cows and the average record of the herd:

	Best cow.	Poorest cow.	Average of herd.
Breed	Gr. Holstein	Guernsey	
Age	6 years	2 years	
When fresh	Feb. 23, 1909	Sept. 29, 1909	
Milking period	12 months	11 months	11 months.
Milk, pounds	6,798	4,245	6,987
Fat, per cent	5.3	5.5	4.7
Fat, pounds	356.6	231.9	323.1
Gross returns	$119.91	$78.33	$104.58
Cost of feed	41.03	40.61	43.55
Net profit	78.88	37.72	61.03
Cost 100 pounds milk	.60	.92	.62
Cost 1 pound fat	.115	.17	.13
Returns for $1 expended in feed	2.97	1.95	2.43

Herd No. 12 was composed of eleven pure bred and twenty-five high grade Guernseys. The conditions under which this herd were kept were as good as possible, for the owner had to employ men to do all the work. The surroundings were sanitary.

The following ration was fed during the winter of 1908 and 1909: Silage, 35 lbs.; alfalfa, seven pounds in November and December; marsh hay in January, February and March; corn stover in December, March and April; clover hay in April and May. For concentrates: Bran, six pounds per day for winter; barley fed in November and December; Ajax Flakes in April and May, two and one-half pounds per day. Some gluten, dried brewers grains and oil meal was fed; in the fall oil meal took the place of the gluten. Alfalfa was fed in August and October; in September silage took the place of alfalfa. Note: Poorest cow was taken sick after being in test seven months.

The following table shows the yearly record of the best and poorest cows and the average record of the herd.

	Best cow.	Poorest cow.	Average of herd.
Breed	Gr. Guernsey	Reg. Guernsey	R. & Gr. Guer.
Age			
When fresh	Jan. 2. 1909	Not fresh in year	Fall.
Milking period	10½ months	7 months	11 months.
Milk, pounds	6,200	1,517.6	3,793
Fat, per cent	4.8	6.6	5.8
Fat, pounds	295.1	101.6	218.5
Gross returns	$95.92	$35. 2	$71.14
Cost of feed	40.88	39.73	41.78
Net profit	55.04	—4.61	29.36
Cost 100 pounds milk	.66	2.24	1.10
Cost 1 pound fat	.14	.38	.19
Returns for $1 expended in feed	2.34	.88	1.72

Herd No. 13 was composed of pure bred Holsteins and Guernseys, also a number of high grade cows. Registered Holstein and Guernsey sires were used. The herd contained thirty-six cows at certain times during the year but only thirteen completed a full year's work on account of the number bought and sold. The owner said he found this method the most practicable way of finding out his poor cows. Conditions under which this herd were kept were very good considering the number.

The following ration was fed during the winter of 1908 and 1909: Silage, fifteen pounds; corn stover, seven pounds; mixed hay, six pounds; ten pounds of grain mixture composed of bran four parts, gluten two parts, cotton seed meal one part, was given to fresh cows and those nearing the close of their lactation period only received five pounds. Pasture was blue grass and a grain ration was given in summer the same as in winter. In August and September green fodder corn was fed, but grain ration was lessened nearly one-half.

The following table gives the yearly record of the best and poorest cows and the average of the herd:

	Best cow.	Poorest cow.	Average of herd.
Breed	Reg. Holstein	Gr. Holstein	
Age			
When fresh	Aug. 30, 1909	Dec. 5, 1909	Winter.
Months in milk	11 months	11 months	Average 11 mos.
Milk, pounds	13,101	8,690	8,386
Fat, per cent	3.8	3.6	4.0
Fat, pounds	499	312	339
Gross returns	$166.78	$103.14	$112.09
Cost of feed	46.94	47.35	41.54
Net profit	119.84	55.69	70.55
Cost 100 pounds milk	.35	.54	.50
Cost 1 pound fat	.09	14	.12
Returns for $1 expended in feed	3.63	2.25	2.70

Herd No. 14 contained nearly every breed of cows but the Jersey blood predominated. A Guernsey sire was used. Twenty-three cows were started in the test but only fifteen completed a full year. Some of those started were found to be very unprofitable and were only run a few months. The stable was clean, well lighted and sanitary. Cows were in fair flesh but not nearly as well fed as some herds in the test.

The following ration was fed during the winter of 1908 and 1909: Corn stover, fourteen pounds a day; clover chaff to February 15th; clover hay from February to June. For concentrates: Six pounds per day of two parts of dried brewers grains and one part corn. In January six pounds of International sugar feed was given. In March and April six pounds of the following mixture was fed: Corn meal,

one part; International sugar feed one part. The pasture was blue grass with no grain ration. In September alfalfa hay was given, also some green fodder corn through September and October.

The following table gives the yearly record of the best and poorest cows and the average of the herd:

	Best cow.	Poorest cow.	Average of herd.
Breed	Jersey	Native	
Age			
Milking period	11 months	7 months	
When fresh	Jan. 8, 1909	Not in year	Early winter.
Milk pounds	6,370	1,620	4,052
Fat, per cent	3.8	6.6	4.8
Fat, pounds	242.3	107.5	193.3
Gross returns	$79.96	$37.15	$63.45
Cost of feed	30.12	26.32	27.05
Net profit	49.84	10.83	36.39
Cost of 1 pound fat	.12	.24	.14
Cost 100 pounds milk	.47	1.62	.66
Returns for $1 expended in feed	2.65	1.41	2.34

Herd No. 15 consisted of two grade Jerseys, thirteen grade and registered Guernseys and a registered Guernsey sire. The owner said he had two or three cows which he knew were so poor that there was no need of having them tested. It was one of the first herds in which a pure bred sire was used in the vicinity of Ft. Atkinson. The benefit derived from the care and time given in breeding, selection and care of the herd was shown by the returns for $1.00 expended in feed. The barn and surroundings were in the best condition for the comfort and care of the cows.

The following ration was fed during the winter of 1908 and 1909: Silage, thirty pounds; clover hay, eight pounds; corn stover, seven pounds. For concentrates: Corn and cob meal, two parts; bran, one part; International sugar feed, one part; barley (ground), one part; also a little oil meal or gluten. Eight pounds of the mixture was fed per cow per day. In May six pounds of a mixture of two parts bran and one part barley (ground). The pasture was a blue grass upland and no grain fed with it. In August and September green fodder corn was fed with pasture.

The following table gives the yearly record of the best and poorest cows and the average of the herd:

	Best cow.	Poorest cow.	Average of herd.
Breed	Reg. Guernsey	Gr. Jersey	
Age	6 years	10 years	
In milk	11 months	8 months	
When fresh	Nov. 4, 1908	Dec. 3, 1908	
Milk, pounds	10,028	6,001	7,369
Fat, per cent	5.0	4.5	5.3
Fat, pounds	505	272	392
Gross returns	$169.45	$91.43	$131.15
Cost of feed	45.11	40.57	44.99
Net profit	124.34	50.86	86.26
Cost 100 pounds milk	.45	.68	.60
Cost 1 pound fat	.09	.15	.112
Returns for $1 expended in feed	3.75	2.25	2.92

Herd No. 16 consisted of no particular breed, although a pure bred Guernsey sire was used and a few cows showed some Guernsey blood. There were eight cows in the herd at the start and only five continued a full year. One died and two were sold, one going to the butcher on account of her unprofitableness from the milk-producing standpoint. The barn was well built but not as clean and sanitary as it might have been. The owner took no extra care of the herd nor in the breeding.

The following ration was fed during the winter of 1908 and 1909: Corn fodder, fifteen pounds; corn stover ten pounds; marsh hay, *ad-libitum* in December and January. For concentrates: Bran in January and February, six pounds per day; then Sugarota in March and April; corn meal and bran in May and June, mixed about two parts bran and four parts corn meal. The pasture was blue grass. Three pounds corn meal was given in July and four pounds barley in August. Green fodder corn was given in August and September.

The following table gives the yearly record of the best and poorest cows and the average of the herd:

	Best cow.	Poorest cow.	Average of herd.
Breed	Gr. S. H.	Gr.	S. H.
Age			
Months in milk	10 months	11 months	10½ months.
When fresh	Dec. 15, 1908	Oct. 10, 1908	Fall.
Milk, pounds	8,399	5,662	6,631
Fat per cent	3.5	4.2	4.0
Fat, pounds	294.	239.	266.
Gross returns	$96.56	$79.66	$87.00
Cost of feed	49.52	47.94	47.51
Net profit	47.04	31.72	39.49
Cost 100 pounds milk	.59	.84	.71
Cost 1 pound fat	.16	.20	.17
Returns for $1 expended in feed	1.95	1.65	1.83

The following table compares the results of the best and the poorest cows in the association:

	Best cow.	Poorest cow.	Difference.
Breed	Reg. Guernsey	Native	
Age	6 years	9 years	
Milking period	11 months	6 months	
Milk, pounds	10,028	1,433	8,595
Fat, per cent.	5.0	4.7	
Fat, pounds	505	67.8	437.2
Gross returns	$169.45	$23.66	$145.79
Cost of feed	45.11	28.99	16.12
Net profit	124.34	—5.33	129.67
Cost 100 pounds milk	.45	1.65	1.20
Cost 1 pound fat	.09	.40	.31
Returns for $1 expended in feed	3.75	—.82	4.57

(2) The following table compares the results of the best and the poorest herds in the association.

	Best herd averaged.	Poorest herd averaged,	Difference.
Milk, pounds	7,369	3,622.6	3,746.4
Fat, per cent	5.3	4.4	
Fat, pounds	392	159	233
Gross returns	$131.15	$52.80	$78.35
Cost of feed	44.99	28.53	16.46
Net profit	86.26	24.27	61.99
Cost 100 pounds milk	.60	.78	.18
Cost 1 pound fat	.12	.18	.06
Returns for $1 expended in feed	2.92	1.85	1.07

(3) The following table compares the results of the best herd and the average of all the herds.

	Best herd, averaged.	Average of all herds.	Difference.
Milk	7,369	5,709	1,660
Fat, per cent	5.3	4.2	
Fat, pounds	392	242	150
Gross returns	$131.15	$83.63	$47.52
Cost of feed	44.99	37.76	7.23
Net profit	86.26	45.87	40.39
Cost 100 pounds milk	.60	.66	.06
Cost 1 pound fat	.12	.15	.03
Returns for $1 expended in feed	2.92	2.21	.71

TREASURER'S REPORT FOR 1908.

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 hand were received and the disbursements paid on orders from the Secretary which I hold as vouchers.

RECEIPTS.

Feb. 6.	Amount in hands of treasurer	$797 77
	Memberships	38 00
June 8.	From state treasurer	1,000 00
Aug. 12.	From state treasurer	1,000 00
Nov. 9.	From state treasurer	1,000 00
1909.		
Jan. 21.	From state treasurer	2,000 00
Apr. 25.	Memberships	2 00
		$5,837 77

DISBURSEMENTS.

Mar. 27.	Dr. H. L. Russell, exp. Monroe convention	$2 80
Mar. 27.	H. K. Loomis, hotel bills, Monroe convention	59 75
Mar. 27.	H. K. Loomis, exp., Monroe convention	11 39
Mar. 27.	D. H. Otis, exp., Monroe convention	2 95
Mar. 27.	W. J. Gillett, exp., Monroe convention	9 73
Mar. 27.	C. P. Goodrich, exp., Monroe convention	3 41
Mar. 27.	H. K. Loomis, premiums	30 00
Apr. 9.	F. Marty, taking cow census	28 74
Apr. 9.	Peter Zumkehr, instructor	120 00
Apr. 9.	H. C. Searles, instructor	155 22
Apr. 11.	W. A. Henry, exp., Monroe convention	2 45
May 1.	W. J. Fraser, exp., Monroe convention	11 36
May 1.	Mrs. A. J. Kelly, reporting convention	106 00
May 12.	Peter Zumkehr, instructor	100 00
May 12.	H. C. Searles, instructor	161 55
May 28.	Fond du Lac Printing Co	23 14
June 10.	Peter Zumkehr, instructor	130 00
June 10.	H. C. Searles, instructor	168 93
June 30.	F. H. Scribner, exp., attending dairy meetings	70 02

July	3.	H. C. Searles, instructor	186 91
July	3.	Peter Zumkehr, instructor	130 00
July	11.	Miss Stella Dunkle, stenographer	12 00
July	30.	F. H. Scribner, expense	5 86
Aug.	6.	Clark Engraving & Printing Co	6 24
Aug.	6.	H. C. Searles, instructor	208 29
Aug.	6.	Peter Zumkehr, instructor	135 00
Sept.	2.	H. C. Searles, instructor	196 12
Sept.	8.	Peter Zumkehr, instructor	130 00
Oct.	12.	H. C. Searles, instructor	170 13
Oct.	12.	Peter Zumkehr, instructor	95 00
Oct.	12.	H. K. Loomis, postage	50
Nov.	5.	Ray N. West, instructor	137 44
Nov.	5.	H. C. Searles, instructor	182 36
Nov.	5.	Peter Zumkehr, instructor	135 00
Nov.	5.	Cornish Curtis & Green, supplies	9 59
Dec.	9.	Ray N. West, instructor	134 79
Dec.	9.	H. C. Searles, instructor	176 90
Dec.	9.	Peter Zumkehr, instructor	120 00
1909.			
Jan.	7.	H. C. Searles, instructor	167 33
Jan.	20.	Ray N. West, instructor	151 32
Jan.	20.	Henry Elmer, printing proceedings Swiss Cheese-makers' convention	122 29
Jan.	20.	Peter Zumkehr, printing	2 50
Jan.	20.	Cornish Curtis & Green, supplies	25 98
Jan.	20.	Fargo Creamery Co., supplies	18 70
Feb.	6.	Schaum Engraving & Printing Co	4 90
Feb.	6.	Wisconsin Dairy Supply Co	11 05
Feb.	6.	H. C. Searles, instructor	180 88
Feb.	6.	Ray N. West, instructor	154 54
Feb.	6.	Peter Zumkehr, instructor	40 00
Feb.	6.	Cornish Curtis & Green, supplies	35 85
Feb.	17.	W. D. Hoard & Co., printing	60 70
Mar.	2.	H. K. Loomis, postage	1 00
Mar.	2.	Express on treasurer's book	35
Mar.	22.	A. J. Glover, secretary, salary and expenses	259 22
Apr.	23.	A. J. Glover, exp., sec. office	94 99
		Balance in treasurer's hands	1,136 69
			$5,837 77

SECRETARY'S REPORT, 1908.

To the President and Members of the Wisconsin Dairymen's Association:

I have the honor to submit the following report of the expenditures covering the period from the adjournment of our Convention at Monroe, (March 11, 12 and 13th, 1908), to the present time.

Convention expenses of 1908	$209 84	
Convention premiums paid	30 00	
		$239 84
Instructor H. C. Searles, 11 months, organizing cow testing associations	$1,046 00	
Expenses	908 62	
		1,954 62
Instructor R. N. West, 4 months, organizing cow testing associations	240 00	
Expenses	338 09	
		578 09
Fred Marty, for taking cow census		28 74
Printing, programs, letterheads, books for cow testing associations		83 84
Office and traveling expenses of secretary	$104 21	
Salary of secretary	250 00	
		354 21
Cuts for report and program		11 14
F. H. Scribner, president, expenses, attending Tuberculosis convention	5 86	
Attending summer conventions	70 02	
		75 88
Outfits for cow testing association		101 08
Stella Dunkle, stenographer		12 00
H. K. Loomis, stamps, express		1 85
Swiss Cheesemaking Purposes.		
Instructor Peter Zumkehr, 227.5 days	$1,137 50	
Printing report	122 29	
		1,259 79
Total		$4,701 08

The President: I want to say in closing that we have had a very pleasant stay with you people here. We certainly have enjoyed it from our standpoint and if you people have been as well pleased with the meeting as we are, we shall all leave here well satisfied, I am sure.

It is to get people to thinking that we have these meetings, and if we have only succeeded in getting some new people thinking on these lines, we shall have accomplished what we came for. I hope you won't go back on the farm and forget the good things you have heard here. Let's keep thinking about them and see if we can't make the year 1909, a far more prosperous year than we have had before, and if we will only do this, I am sure it will be good for us all that we have been here. I thank you.

Mr. Ellsworth: Mr. President and Gentlemen of the Wisconsin State Dairymen's Association: In behalf of the three Breeding Associations of Barron County who sent me to Monroe last year to invite you to come here, we now thank you for coming here, and in behalf of those Breeding Associations and in behalf of the citizens of the city of Barron and Barron county, we invite you to come again. While we do not wish to be greedy, we would be glad to have you come at any time. We believe that you can do as much good in this locality as in any other.

The President: We now stand adjourned.

AUXILIARY MEETINGS HELD IN MARCH AND JULY BY MESSRS. F. H. SCRIBNER AND H. C. SEARLES.

There were held under the auspices of the Wisconsin Dairymen's Association, three meetings in March, 1909. The first meeting, held March 23, was at Centralia, Polk county. Mr. Ernest Nelson of Rosendale was instrumental in getting this meeting, and was very desirous that a cow testing association should be organized there. About sixty-five were present.

The next meeting, held at Bloomer, Chippewa county, March 25, was also an interesting one, with sixty present, and through its influence a test association was organized.

March 26, a meeting was held at Rice Lake, Barron county, and although the attendance was small, yet the interest was so strong that later on a test association was formed.

In June, five meetings were held in Burnett county, the first at Grantsburg. There were only about a dozen present. It was something of a showery day which may partly account for the small attendance, but the few were interested.

The second meeting was held at Falun, with about the same result.

The third meeting, at Siren, gave us new courage and we felt that after all some good things might come out of Burnett county. There were over fifty present.

The fourth meeting, at Aaron, the 25th, was a picnic meeting held in the grove, in which a morning and afternoon session was held. About 75 were present and all entered into the discussions with a lot of interest.

The last of the series was held at Orange Saturday evening, the 26th, with about seventy-five present. As a result of this series of meetings, a Burnett County Breeders' Association was organized.

F. H. SCRIBNER.

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ANNIE LAURIE KELLY
Official Reporter for Thirty Years of the
Wisconsin Dairymen's Association

THIRTY-EIGHTH ANNUAL REPORT

OF THE

WISCONSIN

Dairymen's Association

HELD AT

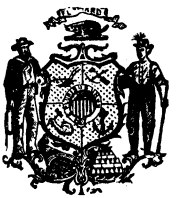
West Salem, Wis., February 9, 10 and 11, 1910.

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

COMPILED BY

A. J. GLOVER, Secretary.

MRS. A. L. KELLY, Stenographic Reporter.



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1910

LETTER OF TRANSMITTAL.

WISCONSIN DAIRYMEN'S ASSOCIATION,

Secretary's Office,

FORT ATKINSON, WIS., June 25, 1910.

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-eighth 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 Wet Salem.

Very respectfully,

A. J. GLOVER,

Secretary.

OFFICERS

PRESIDENT,
H. D. GRISWOLD,
WEST SALEM, LA CROSSE COUNTY.

VICE-PRESIDENTS,
A. D. DELAND. SHEBOYGAN, SHEBOYGAN COUNTY,
President 1877.

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President 1891-3.

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President 1894-5.

G. W. BURCHARD, FORT ATKINSON, JEFFERSON COUNTY,
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W. J. GILLETT, ROSENDALE, FOND DU LAC COUNTY,
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F. H. SCRIBNER, ROSENDALE, FOND DU LAC COUNTY,
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SECRETARY,
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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 —, 1903.

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.

MEMBERSHIP, 1910.

A

Atwood, R. A., Trempealeau.
Aldrich, Howard, West Salem.
Anderson, Math., Holmen, R. 1, Wis
Amborn, F. H., Mindoro, Wis.
Atwater, L. F., Bangor.
Alexander, C. B., Chicago, R. 62, No. 4 Sherman.
Aderhold, E. L., Neenah.
Allen, J. Ford, Chicago, 215 Jackson Blvd.

B

Brandt, Chas., West Salem.
Bartlett, Wm., Barron, R. 2.
Burdick, A. H., Tomah.
Brown, Ed., West Salem.
Boles, F. I., West Salem.
Betz, Geo., Rushford, Minn.

C

Clark, J. D., Whitewater.
Cook, S. A., Neenah.
Cullman, A. C., West Salem.
Crouch, Lewis, Hartland, R. 21.
Cox, C. L., Reedstown.
Cronk, H. M., West Salem.
Corneliuson, T., Madison.

D

Dudley, G. W., West Salem.
Dousky, F., St. Joseph, R. 1.
Dudley, W. I., West Salem.
Dawson, W. J., La Crosse, R. 1.

E

Eggler, Caspar, La Crosse.

F

Freeman, G. A., Sparta, Wis., R. F. D.
Farnam, E. C., Holmen, R. 1.
Fleming, B. F., Jefferson.

G

Goddard, L. M., La Crosse.
Goodrich, C. P., Ft. Atkinson, Wis.
Gollickson, Peter, Mindoro.
Griswold, H. W., West Salem.
Griswold, H. D, West Salem.
Gollickson, O., West Salem.
Gilfulian, J. H., West Salem.
Gloeckler, Theo., Portage.

H

Hember, J., West Salem.
Haus, Enoch, West Salem.
Heider, H. C., West Salem.
Hanchett, W. H., Sparta.
Handcock, L., Tomah.
Hill, C. C., Tomah.
Harris, R. T., Warrens.
Howell, H. P., Sparta.
Hendrickson, Sam, Holmen.
Hodge, R. L., Mindoro.
Hopkins, A. W., Madison.
Halverson, J. N., Holmen.
Hill, C. L., Rosendale, Wis.

J

Jewett, Harry, Bangor.
Johnson, A. A., Onalaska.
Johnson, J. P., Holmen, Wis.
Jewett, H. L., West Salem.
Jacobs, E. C., Menomonie.
Jennings, A. A., Chicago.

K

Keppel, Val., Holmen, R. R.
Kauerin, Chas., Mindoro.
Knutson, Chas., West Salem.
Knudson, J. L., Mindoro.
Knudson, Math., Holmen, R. 1.
Krogsbal, C., Viroqua.

L

Leete, C., West Salem.
Larson, P. A., Onalaska.

MEMBERSHIP, 1910—Continued.

Linse, Chas., La Crosse.
Late, W. W., West Salem.
Linse, Jos., La Crosse.
Leete, J. G., Sparta.
Lewis, R., West Salem
Lawrence, F. W., Bangor.
Larson, L., Bangor.
Lee, M. B., Tomah.
Loomis, H. K., Sheboygan Falls.
Larson, G. P., Holmen, R. 2.
Lawson, W. J., La Crosse, R. 1.
Lemke. L. C., Onalaska.
Lebakkon, M., Holmen.

M

McClintock, Mindoro.
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Mooney, F. J., Sparta.
Miller, E. D., West Salem.
Miller, W. F., West Salem.
Miller, D. F., West Salem.
Martin, Andrew, West Salem.

N

Nuttleman, F., West Salem, R. 2.
Nichols, W., Trempealeau.
Nason, H. E., Osceola.
Nerhaugen, E. O., St. Paul, Minn., Gilfillan Blk.
Nuttleman, A., West Salem.

O

Ofstidahl, A. O., Holmen, R. 1.
Ora, Mrs. H. F., Manawa, R. 2.
Orn, C. J., Barron, R. 1.

P

Pierce, Art, West Salem.
Paulson, H. E., Hollandale, Wis.

R

Robertson, R. B., Tomah.
Rowlands, R. W., Waukesha.

S

Scribner, F. H., Rosendale.
Shane, D., West Salem.
Sander, L. C., West Salem.
Samuels, E. T., West Salem.
Smith, W. J., West Salem, R. 2.
Storant, G. W., Mindoro.
Smith, Abner, West Salem.
Searles, C. H., Fond du Lac.
Sandman, W. D., Holmen.

T

Thomas, J. W., North Bend.
Thompson, F. S., Eau Claire.
Taylor, H. C., Orfordville.
Trimbell, D., West Salem.
Tuller, E. R., Holmen, R. 2.
Tracy, J. W., Holmen, R. 2.

V

Van Loon, J., La Crosse, R. 1.
Vandervort, R., Tomah.

W

Walker, R. C., Kilbourn.
Walker, J. A., Chicago.
Westerhouse, G., Onalaska, R. 1.
Wells, M. L., Rosendale.
Wege, Theo., West Salem.
Will, E. C., Holmen.
Wyatt, E., Tomah.

TRANSACTIONS

WITH

ACCOMPANYING PAPERS AND DISCUSSIONS

OF THE

Wisconsin Dairymen's Association

AT THEIR

THIRTY-EIGHTH ANNUAL CONVENTION

Held at West Salem, Wis., February 9, 10, 11, 1910.

President F. H. Scribner in the chair.

The Chairman: The convention will please come to order and prayer will be offered by the Rev. Cole.

Prayer by Rev. Mr. Cole.

Address of welcome by Mayor VanZandt.

Responses.

Mr. Goodrich called to the chair.

PRESIDENT'S ADDRESS.

PRESIDENT F. H. SCRIBNER, Rosendale, Wis.

Ladies and Gentlemen and Members of the Wisconsin Dairymen's Association:

The object of the Wisconsin Dairymen's Association ever has been the improvement of the dairy conditions of the state, and as we look back over the thirty-eight years since its organization, a vast improvement surely has been accomplished. We would be presumptuous to attribute all the success that Wisconsin has

achieved along this line, to the efforts of this Association, for indeed many other forces have been at work just as faithfully and persistently. Unquestionably Wisconsin's natural adaptability, her grass resources, climatic conditions, pure and unlimited water supply, has done much toward putting her in the front ranks of this industry.

And yet while much has been accomplished, I am here to predict still greater achievement along dairy lines. Little do we realize the wonderful possibilities that are wrapped up in this wonderful machine, the dairy cow. A few have been permitted to peek in and get a faint glimpse of her productive powers, and this only was accomplished by having a definite aim in view as regards her breeding, her feeding, and care. Little do the masses of so-called dairymen in Wisconsin realize what can be imparted to the offspring, through a good mother, grandmother, and great-grandmother, and seemingly less do they understand the importance of feed and care to develop and bring out their greatest possibilities.

In traveling through the country we find many varying conditions in communities as regards dairy development; some places, no dairy sires, no dairy barns, no dairy feeds, no dairy ideas whatever; while in another locality just the reverse conditions are found, good dairy papers are read, good sires are the rule not the exception, good modern barns with ventilation and light, with good feeds so it may be easy and possible for the cow to do her best. Quite often the cause of such improvement is one, two, or three live men in a community that through their influence and example a good healthy rivalry has sprung up that has made that community a power for good along these lines.

Community breeding associations, such as exist in this locality, tend greatly to create an interest and rivalry which brings out not only the best there is in the animal, but develops the man and sets him to thinking and studying, and when this combination gets together, results follow. A dairy sire is a great educator and as one begins to study his nature, disposition, and development something seems to enter into his nature, that not only makes him more kind towards his stock, but his inner nature is transformed and those characteristics are developed that go to make life worth while.

One encouraging feature of a better condition of things is the constantly increasing number of dairymen that are keeping individual records of their cows. There is no other way that builds up a herd so rapidly as this method. The plan also of taking a one day account each month of the feed consumed by each individual cow, is almost as essential, for there is such a vast difference that cows return to their owners for each dollar's worth of feed, and still one more important thing and that is to know which the regular breeders are. A good, well regulated dairy barn will have a memoranda book, showing date of service and date of birth of calf and sex of same. All these things are valuable data in determining the true value of a cow, for as a rule, these tendencies are transmitted, and if we are attempting bettering the conditions of our live stock, it will pay well to observe the above methods.

Mr. C. P. Goodrich, the veteran dairyman, once made this statement, "It seems singular that dairymen have to be compelled by law to be good to themselves," but such is the case and laws are enacted and put in force to get dairymen to do things that are for their own personal good, sanitary laws to force dairymen to keep their stables and cows clean, to keep the separator in a sanitary place and in a cleanly manner, to make the condition of their stables better in the way of ventilation and light, to have the herd tested for tuberculosis to prevent the spreading of this disease. All these things ought to be foreseen if he is going to build up a good productive herd, and get all there is out of the business.

Never, in the history of this country, were the present and future of the dairy interests so bright, and although the prices of feed, labor and land are extremely high, yet on the other hand dairy products are correspondingly high and as the demand is exceeding the supply, high prices will be the rule for some time, and together with the increased demand for high grade stock, not only from all over our own country, but across the waters as well, it stands everyone in hand to look well to the breeding problem.

It is also of extreme importance that dairymen should feed economically and carefully, and that they try to raise as much of the protein feeds as possible. So many are so narrow minded in regard to the growing of clover, one of the greatest plants

the good Father has favored this country with, and one we should pay especial attention to in growing, not only because of its direct benefits to the soil, but because of its protein nature which aids us materially in balancing a ration for our cows.

The alfalfa plant should also be studied, as without question, aside from the corn, it is the most profitable plant we can grow, and the chemist says is equal ton for ton with wheat bran, and as good alfalfa hay combined with good corn silage practically makes a balanced ration, would be quite an item in the economic production of our dairy products, and while we are not permitted to make prices on our products at the market end, we can, in a very large measure, economize in the cost of production, far more than most of us think. We have drifted into an extravagant condition of feeding rather unknowingly, as the time was when feeds were cheap and abundant, and now, as the reverse condition is upon us, we scarcely realize it, and are feeding in the dark as to the cost. One thing is certain, if we can raise the most of our own feeds, we would know what their composition is, and know there is no adulteration.

I think if dairymen were awake to the fact that oleo men are putting up a tremendous fight to have the Grout bill repealed, they would begin to stir themselves, and let their hired men at Washington know just how they feel about the matter. In many of the farmers' meetings this winter, resolutions have been passed upholding this law, and stating that it gives the dairymen a reasonable protection, by compelling the manufacturer to sell his hog lard, cottonseed oil and tallow for what it is, and not palm it off on the innocent consumer as butter at twice its cost to manufacture, and it is the duty of every creameryman and dairyman to protect himself and the dairy interests by legal regulations against the sale of oleomargarine as butter.

In a recent number of one of our farm papers was a heading that read as follows: "Farmers More Susceptible to Consumption Than Any Other Class of Men," and went on to say, "The ranks of farmers supply more patients to the Iowa State Sanitarium for the treatment of tuberculosis than any other classification of workers, with the single exception of housekeepers. Of forty-nine men admitted to the state sanitarium during the first five months of its existence, thirty-five per cent of the total were farmers. However true this may be in this particular case,

we don't believe it will work out in a general way; the farmer's mode of living, his out-door life, and wholesome, plain food, would naturally bring the reverse condition, and ought to make him the most healthful of any class of people, but this may ring out a warning to farmers and housekeepers, to be more vigilant in the care of the sleeping rooms; sunlight and fresh air retard this kind of germ life.

Many of the country homes have too many shade trees in too close proximity, and keep the sunshine from the dwelling, and the air from circulating. I think the good old song "Let the blessed sunshine in" is just as applicable for our homes and barns as for the Sunday School.

There is an old saying, "it's hard to teach an old dog a new trick". The salvation of our country lies in the young men of today. The teachings of our dairy school, the reading of dairy papers, the experiences of men who have been successful are all helpful to the young man in getting started right.

The Ten Commandments.

(1) Thou shalt call each cow by name, in a gentle and loving manner, for the bos will not hold him guiltless that taketh her name in vain.

(2) Remember the Sabbath day, and do only such work as seemeth necessary.

(3) Six days shalt thou labor and do all thy chores, but the seventh day is Sunday, and the cleaning of the stables and all unnecessary work should be dropped, so that thy son and thy daughter, thy man servant and thy maid-servant may attend church.

(4) Honor and respect the kingly sire, that thy days may be long upon the land which the Lord thy God giveth thee.

(5) Thou shalt not swear.

(6) Thou shalt not scold.

(7) Thou shalt not curry thy cattle with the milking stool.

(8) Thou shalt look well to the comforts of thy cattle.

(9) Thou shalt not bear false witness against thy neighbor's herd, for verily it heapeth coals of fire on thine own head.

(10) Covet not thy neighbor's herd, for verily thou hast made thy selection and verily thou shalt prosper if thou stay by thy choice.

President Scribner resumes chair.

The Chairman: Prof. Woll of Madison will not be able to be here this morning to give us his paper. I think we would like to hear from Mr. Harris, who can give us a good deal of information on the subject of the adulteration of feeds.

Mr. Harris: Mr. President, I have had something to do with the feeding law since 1902, the winter it was enacted. At that time the chief adulteration was in the line of corn, oats, and mill feeds such as shorts. The corn and oat feeds were adulterated with oat hulls from the cereal factories. Just at the time that law was passed, there wasn't so very much adulteration being practiced, but soon after that, it was found so profitable that those who had been engaged in a small way, in mixing feeds with oat hulls and such matters, were unable to continue the business, because the large stores used so much of this offal that the small man could no longer get hold of it at a price at which he could use it with profit.

During the first or second winter, there was also a lot of meal feed shipped into the northwestern part of the state that was very badly adulterated with weed seeds. This came to the knowledge of Prof. Woll who had charge of that feed inspection work and was investigated at once, so that we learned of it in time. The shipment was returned to the parties from whom it was obtained in Minnesota, and since that time we have not found a lot so badly adulterated as that was. There were a great number of different kinds of seeds, and much of it was unfit for feed.

Two years ago we found one lot badly adulterated with mill sweepings. That was the worst we found in this state in the line of mill feed. There was more in the bran than in the shorts although, of course, if anything is mixed in the bran, it is much easier to find than in the shorts.

Soon after the law went into effect, molasses feeds came on the market and have been the source of more or less trouble ever since, although many of the feeds are very good; yet molasses is like charity, it may cover a multitude of sins; when other articles are mixed and molasses put on top it takes considerable time to find out what has been put in. At the present time I think these molasses feeds are in fair condition. Of course new kinds come on the market nearly every year and it takes some time to get acquainted with these, but since the law has been enforced most of them are fairly good.

A few years ago we had a few shipments of rice hulls and rice feed sent up from the mills in Texas and Louisiana. This was widely advertised as something that could be mixed with bran middlings, and it would be impossible to detect it. You could buy them at from $6 to $10 a ton and you can imagine what profits might be made in mixing them with bran at say $20 to $25, and middlings at $20 to $28. A few tried this, and it was tried in other mixtures, but we learned of it in time to give warning to the farmers over the state before the practice had been largely adopted.

We find that in spite of temptations the feed men in this state have fairly honorable intentions; they do not wish to impose on their customers and will not do so under usual conditions, as a class. There are a few large wholesalers that have to be watched continuously, and it has taken a great deal of time to find out where these men are, and when to expect them to put out bad feed, and what to do in case they do put such a feed on the market. Since the law was enacted, no prosecutions have gone clear through, except a test case tried at Antigo to test the law and this case really came to nothing. The offense committed was not serious, and the only reason why it was carried on, was to test a part of the law which the millers of this state objected to, and since that time they have made no objections to that part of the law, and they have given the law active support, because they realize that it protects the honest miller and feed dealer from dishonest competition. It is not the miller so much as it is the man who buys and mixes feeds. If you know who mixes feed, and of what it is composed, you can rely upon the guaranty which is given of the contents, in protein, fat and crude fiber.

The condition of the feed market at the present time is fairly good, in spite of the high prices, and I may say there is very little chance that we will ever get feeds any cheaper. I may say in a way this helps us, because when the farmers realize that feeds are going to keep up to these high prices for a considerable length of time, it makes it more important that they be of the proper quality so that we may get something in return for our money. The farmer cannot get along without these feeds for his cattle and they must be of a good quality.

DISCUSSION.

Mr. Glover: What objections are there to adding rice bran to middlings or wheat bran, or other kind of feed?

Mr. Harris: As to the rice bran, there is a great deal more harm in it than in the rice middlings. The rice middlings have somewhat similar qualities to wheat middlings, but the rice bran has a good deal of silicate in it, sharp fiber, corners, that work into the lining of the intestines and cause trouble right away.

Mr. Glover: As I understand it, the law requires analysis of the feed to accompany it and manufacturers are supposed to live up to the analysis.

Mr. Harris: We had some samples from Tennessee that were supposed to be pure bran and the samples contained a large proportion of corn cobs and corn stalks. A jobber in this state told me that he had a market in Baltimore for many cars right along. They didn't sell it in Wisconsin because this feed business here wouldn't stand for it. Now, that is an adulterated feed. The patent feeds only have to guarantee certain proportions of protein, fat and crude fiber before they can be licensed.

Mr. Philips: What are the ingredients of molasses feed?

Mr. Harris: Almost everything you can imagine. Some have pure straight grains, but usually there are more or less screenings with it and seeds in most of them, some of them germinated.

Mr. Philips: Suppose there was weed seed, would you object to that?

Mr. Harris: Not as far as the sale is concerned; if the farmers want to put them on their land, they are at liberty to do so.

Mr. Philips: There is no way for the farmer to know.

Mr. Harris: Not unless he makes a germinating test.

Mr. Glover: In other words, the law does not protect the farmer from buying weed seed.

Mr. Harris: You never know the variety, that is the trouble. If you wanted to feed pigeon seed and knew you were getting that, it would be all right, but you can't tell most of the time.

A Member: Do you find very much adulteration in straight feeds, like oil meal and bran?

Mr. Harris: In oil meal never, and bran very seldom.

A Member: The adulteration then is in those mixed feeds?

Mr. Harris: Yes, in the mixed feeds. Occasionally in corn and oats.

A Member: What about Ajax Flakes?

Mr. Harris: Ajax Flakes are distillers grains. Some are of a poorer quality than others.

A Member: How about alfalfa meal?

Mr. Harris: That is pure and comes up to the guaranty of the manufacturer.

A Member: Isn't there quite a difference in even that?

Mr. Harris: The analysis has not varied a great deal. It is supposed that some of the alfalfa used has been damaged, but we have never run across any very low grade quality.

Mr. Goodrich: Alfalfa meal is alfalfa hay ground up, as I understand. Now, do they add much feed value to the hay by grinding it?

Mr. Harris: I hardly think so.

Mr. Goodrich: But they charge about twice as much for it as for hay.

Mr. Harris: They are competing with wheat bran,—so the dealers tell me.

The Chairman: Isn't there a difference in the digestible protein?

Mr. Harris: There is more crude fiber in the alfalfa hay than in the bran.

The Chairman: And isn't it the very ripe alfalfa that is ground, as a rule?

Mr. Harris: Yes, it is not the bright colored alfalfa hay. Sometimes they get a good quality and sometimes they cannot obtain it, and they use what they can buy the cheapest. Of course it takes quite an elaborate grinding mill of much power to pulverize alfalfa to a fine meal.

A Member: Isn't it best to mix your own molasses feeds?

Mr. Harris: It is a hard thing to do, though some are successful. You cannot always get the molasses, that is one thing. Molasses is a good thing for cows under certain conditions.

The Chairman: What character of molasses do they use?

Mr. Harris: They use the waste usually; sometimes of cane molasses.

Mr. Philips: At present prices can they afford to furnish power to grind up corn cobs to mix with other feeds?

Mr. Harris: They are certainly making money at it.

Mr. Philips: What is this so-called Schumacher feed?

Mr. Harris: It is supposed to be corn, oats and barley. They say there is nothing else in it, but they take out the best of the kernel, the most digestible part of it. It is a fairly good feed, but costs too much.

A Member: Is there any objection to corn cobs being ground with the corn if the parties know what they are feeding?

Mr. Harris: No, not unless there is an excessive quantity of the cob.

The Chairman: It is a damage to the lining of the cow's stomach, on account of the little sharp point that goes up between the kernels.

Mr. Harris: I never have heard of any serious trouble. If they are feeding enough other grain along with it, it will work all right. Possibly feeding too heavily on corn cob alone where the cob is not ground very fine, might be a bad plan.

Mr. Goodrich: If the corn cob is ground fine it will be all right, but if ground coarse, as it used to be in these cast iron mills, I am well satisfied that it would tend to irritate the cow's stomach.

Mr. Harris: Sometimes they have trouble with their mouths on account of that. The country mills don't like to grind the cob very fine, it costs them more than it is worth. Sometimes they have put in cob crushers and grinders and they have taken them out after a while; it is too hard on the mill, so it doesn't pay a small miller to do that kind of work.

A Member: What about Unicorn feed?

Mr. Harris: That is a good feed.

A Member: What is the law in regard to Minnesota shipping into this state?

Mr. Harris: The feeds must be registered and the percentage of protein, fat and crude fiber guaranteed; that statement must be filed at the experiment station.

A Member: Must that be so if it goes to the consumer?

Mr. Harris: No, he can buy anything if he has it shipped direct to himself.

A Member: Why has not blood meal come into more universal use.

Mr. Harris: Some have esthetic reasons for objecting. They

don't like to feed the blood of one animal to another, and they also have the suspicion that it may not be properly sterilized and may contain germs of tuberculosis, cholera or something else.

Mr. Strauss: How about stock feeds?

Mr. Harris: The less said about them the better.

The Chairman: In a few minutes before the noon hour we will listen to Mr. Hopkins.

Mr. Hopkins:

I believe few influences are doing more for men than just such organizations as this, and this kind of an organization is a matter of co-operation entirely, and can do more to advance the interest of dairying than almost any other form of co-operation. You can create enthusiasm along dairy lines; you can gain inspiration which will surely add enthusiasm in working out your business.

Your business is larger than the mere matter of breeding cattle; you are more than dairy breeders; you are more than farmers, you are men, and consequently have a right to be interested in things beyond your farms and beyond your own neighborhood and by being interested in those matters you are able to give that uplift which we believe farmers are most capable of giving.

I think two or three of the organizations in this state have demonstrated what they can do from the inside. A few days ago at a meeting in Madison, we were talking upon the matter of the Agricultural Department at Washington coming in and inspecting breeding associations, cleaning them up, and I noticed that most of the men here agreed that we could not hope to have this particular association under discussion cleaned up from the standpoint of the man coming in from the outside. The change must be from the inside and must depend upon the character of the men who compose it. I thank you very much.

The Chairman: We have with us this morning Mr. Everett, one of our old presidents and workers, and we shall be glad to hear from him.

Mr. C. H. Everett: Mr. President, Ladies and Gentlemen: This is a milk producers' convention which has come into your midst with a very definite purpose. It is not a convention of buttermakers or cheesemakers, but of dairy farmers. We hold an annual convention every year for the purpose of carrying the

light of better dairying into the dairy sections of the state; for the purpose of enlightening, if possible, the dairy farmers of the state, helping them to see better and to understand better; helping them toward a better appreciation of the power of the mind, for you know that it is the mind more than anything else that brings success, and too many of our farmers seem to be deficient in clear, comprehensive thinking. In years gone by too many have not been good readers and good thinkers. They are reading now, I am glad to say, and they are thinking hard and have solved, during the past twenty years, many of the problems that have confronted the dairymen.

I can remember when we knew but little about the dairy cow, her breeding, the product that she produced, and the growing of proper crops for her feeding. We knew practically nothing of the analyses of milk and of feeds; farmers were feeding most anything and everything they grew. They were feeding rations of corn meal and timothy hay and expected to get milk in large quantities, composed very largely of elements not contained in either corn or timothy hay to any extent. It was almost like putting wheat into a threshing machine and looking for oats at the other end. Later on, our farmers began to study the question of breeding, the question of feeds and feeding, began to understand there was much in the breeding of a dairy cow; began to see there was a difference in the form of cows; that the beef cow and the dairy cow did not resemble each other in conformation, and the more they looked into the matter the more they became convinced that each one of those two animals was created for a distinct purpose; that the dairy cow could not make beef profitably, because she had the wrong conformation; in other words, she had no form upon which to place high-priced beef. They came to understand that she was a manufacturer internally, so to speak, that she was making milk of her feed and that she must have large nostrils, a large heart and large lungs, large digestive capacity, and a large udder. She must inhale large quantities of pure, wholesome air, and that led to the subject of better ventilation of our barns, purer and healthier conditions. We came to learn that the cow must have a strong heart and big lungs, because we soon determined when we began to look into the inside of this dairy cow, that milk was elaborated directly from the blood; that the blood

passes from the lungs to the udder and back through the so-called milk veins to the heart and lungs, and the lungs must be able to purify the blood as it passes through them.

The beef cow manufactures externally; she puts her feed upon the outside of her body, throws it upon the back and the ribs. She has been bred for generations and generations for that one distinct purpose of converting feed into high-priced meat, and the wise breeder has helped her along by making a form better suited, a square form, a form where more surloin and more porterhouse could be stored up.

On the other hand, the dairy breeder, like my friends Scribner and Griswold, men who have made a study of the breeding of dairy cows, don't care anything in particular about size; they are not looking for a large cow, a cow square at both ends or a cow that shows any tendency to make beef out of her feed, to place her feed upon her back, because they know that that feed so placed is lost. You can't get anything for the beef that cow puts on her back without killing the cow. We have what they call the general-purpose cow, or at least we have had, and that proposition has been pretty well threshed out in this state and pretty well killed, because men have been thinking about it, have been reasoning about it, and they have made up their minds that high priced dairy feed is largely wasted when it is put into a so-called general-purpose cow with the idea of making some beef and some milk out of it, and they have determined that it is better to put that feed into a machine made expressly for manufacturing it into milk.

Most of my life has been spent as a dairy farmer and I had to do my own thinking. I found great aid in attending conventions of this character, in reading good literature, and then in thinking and planning for myself. Every man's salvation is up to himself.

Uncle Theodore Lewis who lived in Dunn County, known as the old German swine breeder, was a man wiser than his generation and a deep and studious thinker. I have often heard the old man say that the more we read and study, the higher we rise, and the more we come to understand our own littleness and see our own deficiencies, the further we extend the mental vision which enables the dairy farmer to think clearly, see clearly, to understand the dairy cow and the problems connected with her. Gentlemen, I thank you.

The Chairman: It will devolve upon the association this year to elect some new officers and I will appoint a nominating committee as follows: C. P. Goodrich, chairman, W. W. Leete and Charles H. Everett.

Recess to 1:30 p. m.

The convention met at 1:30 p. m., same day.

President Scribner in the chair.

ALFALFA.

CHARLES LINSE, La Crosse.

Mr. Chairman, Ladies and Gentlemen: You will remember I am here as a substitute for Mr. Hill, but as a substitute is never as good as the genuine article, still I will try to tell you what little I do know about growing alfalfa.

We all know that alfalfa is a great plant. I guess even those who haven't got it will agree to that, because they have read enough about it to make them think it is a great thing. It is one of the best feeds we know of. My first crop I sowed three years ago and I sowed some two years ago. I have a neighbor who sowed alfalfa at the same time and he can tell you just as much about it as I can, but all there is to tell is that we sowed the seed and it grew. We did not prepare the land particularly, anyway we did not inoculate it, probably the better way to do.

I suppose you have all read enough about the clover and the alfalfa plants to know under what conditions they will thrive, you all know that the clover plant, as well as the alfalfa, have these little nodules on the roots which contain germs with the power of transmitting nitrogen from the air into the plant and subsequently into the soil. I sowed this alfalfa seed the same time my neighbor did, and it grew well. The first season it came up nicely and did well for a while, then the leaves turned yellow, but it got better after those first leaves dropped off, and it became green and vigorous so I rather think it was probably

because the proper germs were not in the soil. We cut three crops every year, and my neighbor, Mr. Van Loon, even made four cuttings one year, but it is not advisable to do that, because the summer is so short. The land needs good protection and it is better to leave the fourth crop on the ground. I could have cut the fourth crop and in fact it came so heavy I was afraid it might be smothered out by having too much cover. I have had that experience with red clover; it grew so big after the second cutting that by having a heavy snowfall on top it rotted out, but I suppose this will not be the case with alfalfa.

We have sandy soil, black prairie with a lot of sand, and the alfalfa grew well. But for some reasons there were spots where it didn't come up the first year; whether it was poor seed or not, I don't know. Later on, my neighbor and myself took a notion to sow it on a heavy clay loam, very rich soil, and we had good success.

Every farmer ought to make a trial first with a small piece of ground; not go to work and say "this is a fine plant and we will sow ten acres of alfalfa." Don't undertake to sow a large piece at once. Every farmer ought to be interested enough, if it is only from curiosity, to find out whether this great plant will grow on his farm. Select the best piece of land and prepare, say an acre; work at least one year ahead to enrich this land with lots of manure, and put a crop on it,—corn or potatoes,—to clean it from all weeds, and let the manure and potatoes and working in the land make it rich and fertile. Then plow it in the fall; in the spring take the disk harrow and other harrows and tools, and keep working on that little spot until it is worked two or three times more than it ought to be, and make it like a garden bed. Then sow twenty pounds alfalfa seed to the acre.

If the first season should fail on account of dry weather, or should you not get a good stand, you would have to try it over again, but do not run to another spot, stay right at the same spot and sow it over. Try it the next spring and the third spring, and by and by you will probably make it go, and if you are a stranger to it now, you will get better acquainted and in the course of coming years, alfalfa will be growing in our country just as common and plentiful as red clover. It may not do well on all soils, but neither will red clover.

Come to my barn and you will see that alfalfa is the best feed for dairy cows, especially, that we can get. You have all heard about it in the West, where thousands of tons of alfalfa are grown and made into meal, and I guess it has been sold in this vicinity. A neighbor of mine, from whom I bought several tons of hay, asked all kinds of questions about what I was feeding my cows, and I told him. He says, "You haven't fed ground alfalfa." I said, "No, but I am feeding alfalfa nevertheless." Well, he wanted to know where I got it, and I told him about raising it, it was then in my barn, and he was greatly surprised to know that alfalfa was grown in this country, and he living only two miles away. I hear the price for this ground alfalfa meal is as high as bran, so there must be something in it. It must be pretty good stuff, at any rate I would advise every farmer to try it. That is all.

DISCUSSION.

Prof. Fraser: How many tons did you cut to the acre?

Mr. Linse: I think about four and a half or five tons.

A Member: Mr. Linse, in case you have a partial stand of alfalfa, would you say it was advisable to plow up the field and reseed it entirely, or to fill in those places where there isn't any?

Mr. Linse: Well, you can do both. If alfalfa is started, perhaps it would be a good idea to fill in, leave it and not plow it up.

The Chairman: At what season of the year do you sow your seed?

Mr. Linse: Three years ago I sowed mine about the first week in May, I should judge; I kept watching my neighbor, Mr. Van Loon, right along, and kept saying to myself, "Isn't that man going to sow his alfalfa?" Well, when it came nearly June he sowed it and obtained a good big crop that same fall. He sowed it without a nurse crop.

Mr. Goodrich: Have you, or anybody else in this section, tried sowing it in the fall?

Mr. Linse: Yes, a man that used to be my neighbor. Last

year I visited him, and he showed me a piece of alfalfa which was sowed in the fall after harvest, and it looked well. But I learned afterwards from his brother that that alfalfa killed out during the winter. I think it is not advisable in this country to sow it in the fall.

Mr. Everett: How do you make alfalfa hay?

Mr. Linse: I make it like any other hay, like clover hay. I guess it is a little easier, in fact, to make alfalfa than clover hay; it has a finer stem. We all know what it means to make clover hay, this great big, lodged-down clover. Alfalfa handles more like timothy; it won't shed water like timothy, but it is better than red clover. I never like to cut clover in the forenoon, though I am different from a good many others in that respect. I always start in the afternoon in the clover field, and the same for alfalfa; then I am sure all the moisture from dew is out. The night's dew will not do it any harm, and the next morning just as quick as this dew is off, and this is something a great many of you will object to, I use the hay tedder, and give it a good shaking; just lift it from the ground enough for the light breeze and air to go through and wilt it. Then in the afternoon, about two o'clock, I go to work with my hay rake at once. The hay is cocked quite green. Don't undertake to make your hay in regular Yankee fashion, that is, take the fork and roll it into a bunch and go ahead and make another bunch, but start in the middle and form the bottom of the cock, not too big, and take a forkful from the other side and so keep cocking up and you will get a nice cock of hay and it will shed quite a little rain. But if the rain does come, don't go to work and tear those cocks all to pieces and dry them quickly. After a good heavy rain take those cocks apart in two or three lumps, handle them carefully, not turn them over or shake them up in any way. Just set them apart and before night—it won't take long to dry, a couple of men can cock it up again.

A Member: When you take those hay cocks apart and put them together again before night, are they thoroughly dry?

Mr. Linse: No.

A Member: In case it did not rain on those cocks again would you take them apart before you hauled them in?

Mr. Linse: Certainly.

The Chairman: I have watched the use of the hay cap quite

a little. I live near Mr. Hill and I am sometimes surprised to see the large number of hay caps that stay on in an ordinary rain. Of course a hurricane is a different matter, but in an ordinary rain they will stay on all right.

A Member: What is used to keep those caps on?

The Chairman: Some use part of a horse shoe and some have iron nuts, washers, etc.

Mr. Linse: I think a hay cap is a pretty good thing, but on the other hand we must not forget we have to deal with this labor question, and it takes quite a lot of labor to handle these caps, and where you have only two or three men in the field and have a lot of hay down and you want to hurry, you are glad to get that hay together without fussing with caps.

Mr. Everett: A good many farmers in the state are making hay caps right now for another year, and a good many are making cement weights, a little ball of cement with a piece of wire in each fastened to a string. The string should be the length of a pencil between the weight and the cap, so that it is almost impossible to blow off except in a gale.

Mr. Goodrich: I want to say a little something about alfalfa. I have studied it a good deal, not only in Wisconsin, but in Missouri, Kansas and Iowa,—not for the benefit of these gentlemen who have been raising it, for they have found it out, but to keep some farmers from making an expensive mistake. They want to know about these things.

Alfalfa is a peculiar plant. When it gets about ready to cut, just beginning to blossom, you will find on examination around the roots, a whole lot of little suckers coming up. Now, that is for the second crop, and then is the time to cut it. A great many men raising alfalfa do not look at the blossoms at the right time. Most of us look to see if it is beginning to blossom, but we should examine the roots. Now, there is another peculiarity; if a stalk of alfalfa is cut off, that stalk don't sprout up again, it has to start from the root. So you see if you let the first crop go too long before cutting, till the second crop gets four or five inches or so high, you will not only get a poorer crop because that has grown woody and the leaves are dropping off, but you cut off the little sprouts of the second crop and it has to start again from the ground and your alfalfa will look as though it was dead. What is the matter? You have not only

cut off the first crop, but you have cut off the second crop. So you must be careful to cut it just when these little suckers are up an inch or an inch and a half so that the mower blade will not catch them and your second crop will grow right on.

One of my sons has half of his farm in alfalfa all the time; he uses it in rotation crops, just the same as you would clover; plows up the alfalfa when it is the finest you ever saw, after the field has been three years in alfalfa. Then it is planted in corn for two years. A young man came along one time and said, "Will, what are you plowing up that fine alfalfa field for? That will raise a good crop." "Well", he says, "I want to raise a good crop of corn," and he had the biggest crop of corn that ever grew out there in that country. Two years ago when I was there he made his third crop of alfalfa just twenty-six days after the second crop was cut. The weather had been favorable and it was time to cut it.

Mr. Everett: As good a stand of alfalfa as I have ever seen was sown on rye a year ago last spring by Mr. Bowen of Racine county. Just as soon as the land was fit to harrow, rye was sown broadcast and harrowed.

Mr. Van Loon: I believe the right way to sow alfalfa and clover seed is just at that time. I believe we do not sow our clover and alfalfa early enough, as a rule. Many weeds do not come up until the ground gets warm and the plant has to contend with them, but if you put in alfalfa at the time you generally sow clover seed, you overcome a lot of them and I believe the risk you run in losing the clover plant and seed, as well by sowing it early, is not nearly as great as it is to sow it later, because at that time the alfalfa plant comes in contact with the weeds.

Mr. Goodrich: One of the best stands of clover I ever saw, was plowed up early in the spring as soon as the ground was fit to plow, and then harrowed about every week. The weed seeds would sprout and he would harrow it so as to kill all the weeds. This was kept up until the 24th day of June. Then alfalfa was sown and no weeds grew with it, I never saw any better stand than that.

VENTILATION OF FARM BUILDINGS.

E. L. ADERHOLD, NEENAH.

The ventilation of most of Wisconsin's cow barns is attempted by various means, such as open windows or doors, trap doors in the ceiling, flues running from the ceiling up, openings in the walls, leaky walls and ceilings, etc., and we have read about the use of muslin windows.

Some of these devices are faulty part of the time and others all of the time; for instance, on a mild, still day, good ventilation can be secured by the use of open windows and doors, while on cold or windy days we usually find doors and windows closed, and for good reasons, in which case they do not answer the purposes of ventilation.

Many stables have stone walls with a few four-inch tile stuck near the top. Such openings let out heat and supply very little fresh air, excepting while the wind blows. All the above named flues, openings, etc., as well as leaky walls and ceilings help to ventilate, but not economically, because they carry out too much heat.

I have not seen muslin windows used, but I would consider them, at best, a much modified opening in the upper part of the wall. In my opinion, they do not come anywhere near to filling the bill, excepting where very little ventilation is required.

With lands, labor, feeds and cows at high prices, the sensible dairyman will prevent some of the leaks by providing environments which will enable the cow to do her best. Cows pay big for comfort and it can be had at an extremely small cost. A warm barn is a necessity to comfort in Wisconsin. A cold barn does not furnish it and is a food waster. The heat generated by the cows should be utilized as fully as possible in warming fresh air.

The cow barn is a permanent fixture on a dairy farm, so it will pay to insulate the walls, to have a tight ceiling and, in many cases, to put on storm windows. Having provided quarters that are comfortably warm, we should ventilate as much as possible without making the barn too cold.

In the absence of artificial means this result can only be brought about by using the "King" system of ventilation, because with it only the coldest air is removed and it has advantages aside from that.

This system has been so much discussed that it is not advisable to go into details, however so frequently are mistakes made by parties who are attempting to install it that a discussion of the more common mistakes appear pertinent.

Properly constructed foul air flues of the right size are of greatest importance, but of those that have been built, only a small percentage are thoroughly effective.

When a mechanic builds a dwelling house, he plans a chimney that reaches several feet higher than any part of the roof, and the top end is not covered; let the same mechanic plan a foul air flue for a barn (where the same principle is involved) and he will choke the flue with a cap put close to the opening and the chances are that the barn roof would extend far beyond the end of the flue. Aside from that he has no conception of the right capacity of such a flue and I wouldn't give two cents for ventilators built according to his plans. The majority of foul air flues are too small.

Where foul air flues are to be placed at the side of the barn, if it is not feasible (in many cases it is) to continue them directly upward to the required elevation, I would advise to run them from the eaves to the purline plate, or hip, thence directly upward, rather than follow the roof from eaves to ridge, which would be at the expense of efficiency and material.

It is not advisable to have the flue end up in a cupola and, if capped over, the space under the cap should be nearly equal to the diameter of the flue.

I know of a flue that is a little over two feet square and thirty-six feet long built of galvanized iron roofing nailed on the outside of two by four corner posts. The cost of this flue, including labor, was about twenty dollars. I consider that a good way to build large flues.

Where the lower end of the foul air flue is in the way it may be hinged just below the ceiling and swung up out of the way while cleaning out the manure.

Fresh air flues should not discharge near the foul air flues for, if so, the fresh air will drop and be drawn out in place of

foul air. The fresh air should be made to travel some distance before it reaches the foul air flue.

Probably the best effect is obtained where the fresh air discharges in front of a row of cattle and is removed at the rear.

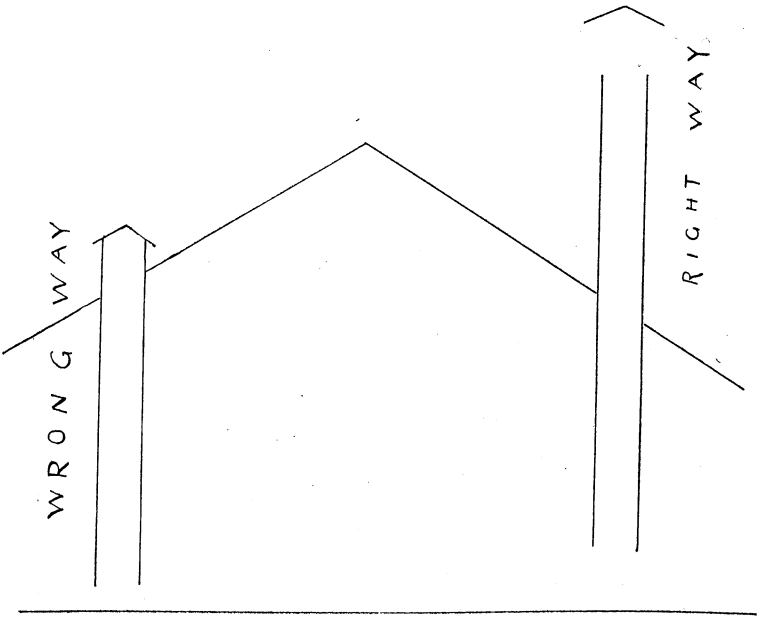


Figure 1.

Figure 1 shows the correct and incorrect ways of capping flues and also the proper elevation of top end of same.

Figure 2 shows a barn arranged for only one row of cows, with the fresh air flues from rear side extending so they will discharge over the feed alley.

Figure 3 shows a barn arranged for two rows of cows facing the side walls, the fresh air discharging over the feed alleys and working toward the rear.

Figure 4 shows a barn arranged for two rows of cows facing each other. The fresh air flues are extended from both sides and made to discharge over the feed alley.

In Figures 2 and 4 all the fresh air that enters the barn, no matter from which side, is fed in front of all the cows.

You know, human nature is not perfect; I have seen an illustration of that very frequently when they go to put up those

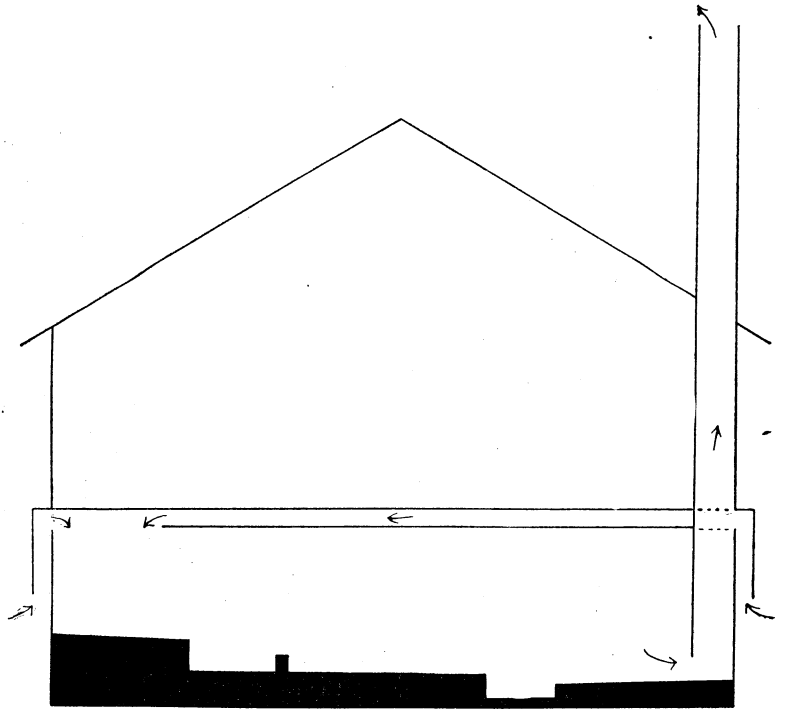


Figure 2.

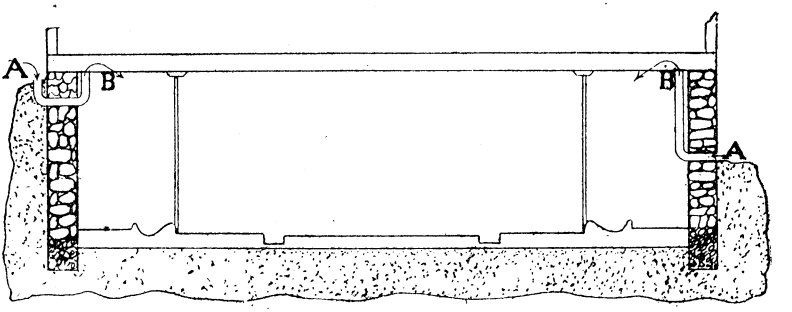


Fig. 3.—Cross section of an old barn with a bank of dirt on one side the entire height of the wall while the other comes only half way up. Flue at the right is constructed by laying a piece of 5 or 6 inch tile in the wall and fitting a stove pipe and elbow or a galvanized iron pipe to the tile. A wire screen should be placed over the outside openings to prevent small animals entering.

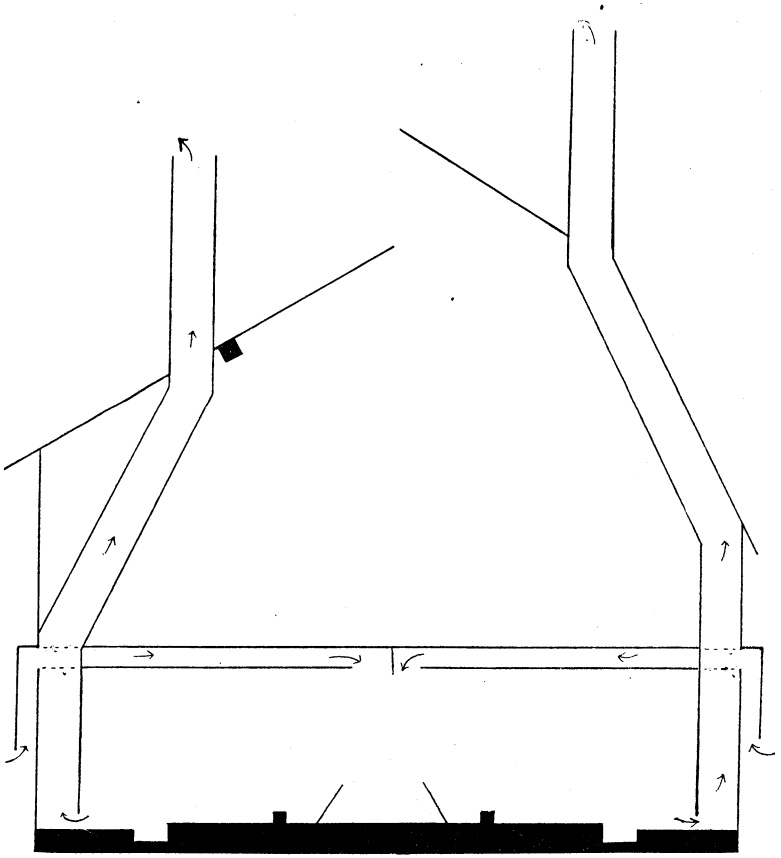


Figure 4.

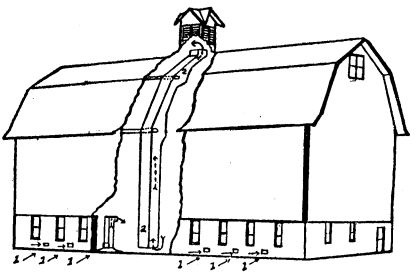


Fig. 5.—The essential features of this system are several inlet flues (1) to distribute the pure air, and one or more foul air flues (2) of adequate size to assure rapid removal of foul air.

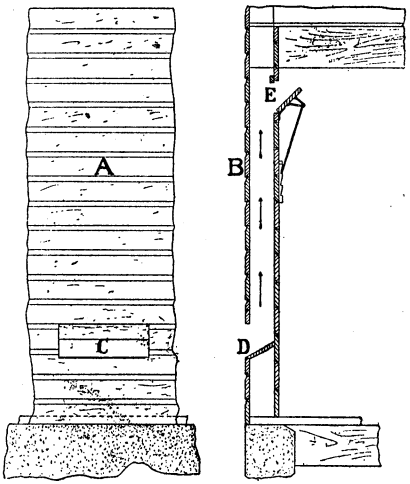


Fig. 6.—A wall section of a stable constructed of wood. The exterior A, shows the opening at C. The cross section B, shows the method of constructing the fresh air intake. The outside opening is shown at D and the inside at E. A simple but effective valve to regulate the supply of fresh air is also shown at E.

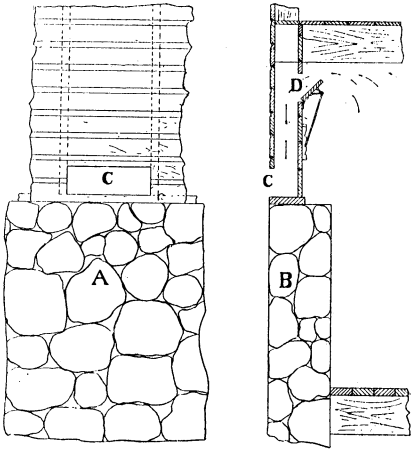


Fig. 7.—Front elevation and cross section construction of a fresh air intake in a half stone or brick wall, A and B. This method may also be installed in an old barn. If an old barn has a full wall, four such openings could be cut away in each wall. The exterior flue opening, C, and the interior, D, near the ceiling are shown.

outlet flues. They should be higher than the ridge of the roof. If they come right out at the peak, they don't need to be much higher than where they come out, because there is always a draft there when the wind is blowing. If the outtake does not come out at the peak, you want to be sure to put it three and maybe more feet higher than the edge of the roof.

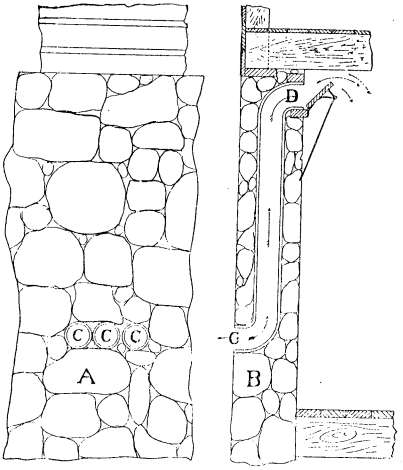


Fig. 8.—Method of installing a fresh air intake in a stone wall during construction. Front elevation A shows openings CCC. Cross section B shows the air intake CD. This intake is constructed of vitrified sewer pipe.

I would not advise you to follow the roof from the eaves up to the peak, although that is all right if it is not in the way of anything, but most of the barns have hay carriers traveling at the peak, and it would be in the way of that. But I wouldn't waste much time or money anyway getting it to the peak if it is handier to have it come out half way up the roof, or even at the eaves.

Now, if you can figure it out that way, it is desirable to feed the fresh air in front of the cattle and have the outtake near the rear, and it is necessary, if you want to get any good from the inlet flues, that the fresh air be made to travel some distance before it can get out. You see with this system, the coldest air being at the floor and the ceiling being tight, cold air is removed, and you can stand a good deal of ventilation. The fresh air is brought in by making it travel upwards three feet or more and discharging at the ceiling. The heat is at the ceiling and we

can make no use of it unless we can get the fresh air through it, and we utilize that heat to warm the fresh air, and by this system the fresh air goes through the heated air and down where the animals get the benefit of it.

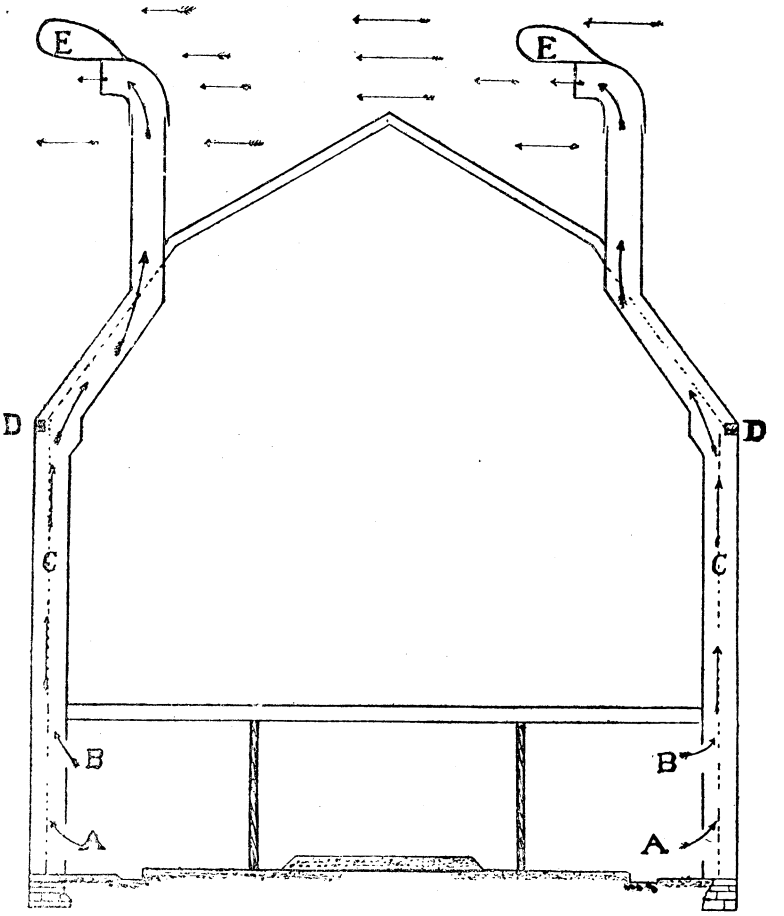


Fig. 9.—Method of constructing foul air flues in a barn in order that they pass through the roof at the gambrel or near the purline plate. This method may be desirable in barns where large quantities of hay are stored, leaving more room from the purline plate to the ridge for the hay carrier to pass back and forth. Installing such flues usually requires the pacing of cowl, E, at the top of each flue. These cowls revolve with the wind as it changes from one direction to another and prevent its entering one flue, passing downward and up the other at the opposite side of the stable. The flue must be enlarged at D. Inlets of fresh air may be constructed in the side walls as in Fig. 1.

I want to caution you about allowing carpenters to put in your ventilators for you. Some carpenters are so allfired smart that if you do not have a plain guide before them and stand right over them with a club, you can make a perfectly safe bet that they are going to spoil the whole thing for you; they know altogether too much to be able to build a good ventilator and don't you forget that. I have seen them cautioned time and time again; it was put down in black and white and they were absolutely ordered to go according to that plan, and yet they spoiled it by doing it their own way. You will find an example of that a little way south of La Crosse where a farmer had a pretty good idea of what the ventilation ought to be. He had been posted by one of the dairy inspectors. He got a carpenter to put it in who took $30 of his money for ventilators that he put in there that are not worth a snap of your finger, except to show how the thing ought not to have been done.

You want to remember that our dairy laws in the case of cow barns require good ventilation; it is unlawful to sell the product of the dairy if the cows are kept in barns not well ventilated.

DISCUSSION.

A Member: What is the reason you do not advocate the use of a cupola as part of the system?

Mr. Aderhold: Well, I knew of one instance where there was a cupola at the peak, where they always are, of course, and there were flues coming from opposite sides and entering the cupola, and when there was a stiff wind on one side, it would blow down the other.

A Member: How is it when there is only one?

Mr. Aderhold: I would keep way from the cupola. I think it will work better without it, it is not part of the system at all, it interferes with the draft. If there is any breeze we want it blowing across there without any obstructions.

Mr. Linse: I have it running into the cupola and I have a good ventilator. Anybody can come into my barn and find pure air in it.

Mr. Van Loon: The ventilation in Mr. Linse's barn is certainly first rate, and so is it in mine.

Mr. Everett: What is your cupola, a wide, slatted cupola?

Mr. Linse: Yes.

Mr. Everett: That would work all right. There is just one point in connection with the outtake ventilator that if any farmer will take into consideration he will be apt to make his flue all right and that is, that an out take ventilator in a barn is nothing more or less than a chimney, and answers the same purpose. You know when a chimney smokes in your house that you have to go out doors and fix it; you know that if the roof projects above the chimney, the chimney won't work, so if you will build your flue exactly as you would build a chimney you will have a good flue. It is put there to draw, and if it doesn't draw it isn't worth anything.

Mr. Aderhold: There are a great many farmers who are afraid it is going to draw. I saw one fellow build a nice flue and he nailed it absolutely tight on top and bored an inch hole on each side. Men have done so many silly things in building ventilators that it has given me the impression that people have not had a chance to show what silly things they can do until they begin to put in ventilators.

A Member: Where a barn is ceiled on the outside and also on the inside, and there are two thicknesses of boards and a thickness of paper, would it be all right to put the hole at the bottom for the inlet flue to come up to the ceiling?

Mr. Aderhold: Yes, you can use the space between the two studs for the inlet flues.

A Member: Would you extend the intake flue two-thirds of the way through the barn and put in small holes to let the air filter out through the barn?

Mr. Aderhold: In some cases. Some have their basements built of stone and they can't cut through very well to get in a number of inlets so they put in a large flue. Of course there is a better distribution of the air if it does not pour in so much at one place.

Mr. Hopkins: It seems to me you have made a good point that many people do not realize, and that is that a good ventilating system, in order to be effective, doesn't have to be expensive.

Mr. Aderhold: It is not expensive. There is nothing to it

but what a man can build himself, and the best time to do it is sometime between now and spring.

A Member: Is there any objection to putting the ventilating flue on the outside of the barn?

Mr. Aderhold: That has to be done sometimes where old stables are already built, and where there doesn't seem to be any place inside without being very much in the way. The Experiment Station at Madison has published a Bulletin No. 164, describing and illustrating this system of ventilation, and it may be had by sending for it.

A Member: Is it absolutely necessary to have those ventilators air-tight?

Mr. Aderhold: Yes, they should be practically air-tight.

The Chairman: I wish we might remember today that one of our veteran workers, W. D. Hoard, is not with us. This is the anniversary of his marriage; he is celebrating his golden wedding, and it has been suggested that we send some kind of a greeting to Governor Hoard.

Mrs. Kelly: Mr. President, I am sure there is one face that we have been accustomed to seeing at these meetings that is very much missed here today, though we have a picture of it hanging over yonder. However, it seems that Mr. Hoard had a previous engagement made nearly fifty years before the time for this meeting was fixed, and I am sure that is a good excuse for his not being here. I am very certain that he is thinking today of the Wisconsin Dairymen's Association, because that is one of the oldest and dearest of the many children of his heart and brain. I therefore suggest, Mr. President, that the following telegram be sent to him and after reading it, will move that the secretary of this association be instructed to forward this message to the governor.

"The Wisconsin Dairymen's Association, in convention assembled, sends heartiest congratulations to Governor and Mrs. W. D. Hoard upon this fiftieth anniversary of their marriage.

"We today wish to express our growing appreciation of those years of usefulness and the indelible imprint that splendid record has left upon two generations, making the name of Hoard

the most widely known and the best loved in the state, and always an inspiration to broader and better citizenship."

On motion, duly seconded, the Secretary was so instructed to send such telegram.

Adjourned to 8 o'clock p. m., same day.

EVENING SESSION

8 p. m.

Secretary Glover in the chair.

Music—Song by High School Chorus, under direction of Mr. C. W. Rand.

Farm Morals and Literature by A. J. Buxton, Racine, Wis.

Music—Song, Girls' Glee Club.

Address by B. H. Rawl, Chief Dairy Division, Agricultural Department, Washington, D. C.

Adjourned till 10 a. m., next day.

MORNING SESSION.

Thursday, February 10, 1910.

President Scribner in the chair.

Prayer by Rev. Mr. McKee.

APPOINTMENT OF COMMITTEE.

Resolutions: A. W. Hopkins, Richard Rolands, Wm. Bartlett.

Auditing Committee: M. L. Wells, H. C. Taylor, G. A. Freeman.

REPORT OF THE WEST SALEM COW TESTING ASSOCIATION FOR YEAR ENDING FEB. 1, 1910.

H. C. SEARLES, Fond du Lac, Wis.

The West Salem Cow Testing Association was organized late in January, 1909; work commenced February 1st, with a membership of 27, representing 367 cows. There has been no lack of interest on the part of the members in making the year's work a grand success. Cows have been found unprofitable in some instances and these have been disposed of. This is in itself evidence of the benefits derived by an association of this sort, as without testing, these cows, which in most cases were good in appearance, would have remained in the herds, their owners not knowing that they were worse than useless. On the other hand a number of cows have been sold at high figures, owing to the fact that the test had shown their true value. One member of the association has refused $160, for his best cow, the test having shown him that he could not afford to dispose of her even at that extreme figure. Cow testing associations of this kind have proven of great value to dairymen in many parts of Wisconsin.

The following list of prices was used in computing the cost of keeping the cows that have been tested by the West Salem Cow Testing Association:

Concentrates.	Per ton.	Roughages.	Per ton.
Oat meal	$24	Silage	$2 [illegible]
Corn and cob meal	18	Hay	8 [illegible]
Bran	24	Corn stover	3 00
Brewers grains dry	27	Green corn fodder	1 50
Oil meal	32	Pasture, per month	1 00
Gluten feed	28		
Barley meal	24		
Cottonseed meal	30		
Ajax Flakes	31		
Badger Feed	26		
Sugarota	25		
Unicorn Feed	31		

The reports of the different herds and the records of the best and poorest cows in the different herds and the average results of the herd, are as follows:

HERD No. 1 is composed of 16 head of Brown Swiss cows, about one-half of them being pure bred; the balance good grades. Their ages range from four to ten years. The cows are kept in good condition, show first-class care, and a pure bred sire has been kept for several years. The barn is large and roomy but lacks in ventilation and light. I think the owner is meeting with good success in his work. The cost of keeping the best cow per year was $30.60; the poorest cow, $33.88; average cost of herd, $31.23. Feed: 18 to 26 lbs. silage and 8 to 16 lbs. hay was fed daily to each animal, in connection with a 5-lb. mixture of corn, oats and ground barley from February to April, then 6 lbs. bran and barley until turned to pasture May 15th, for balance of year; from November 1st, corn stover and bran were given in addition to silage and hay.

The following table shows yearly record of best and poorest cows and average of herd:

	Best cow.	Poorest cow.	Average of herd.
Breed	Brown Swiss	Brown Swiss	
Milking period	11 months	10 months	
Milk, pounds	7902	4568	5883
Fat, per cent	4.1	3.8	4.2
Fat, pounds	329	176	250
Gross returns	$99.61	$55.76	$75.90
Cost of feed	30.60	33.88	31.23
Net profit	69.01	21.88	44.67
Returns for $1.00 expended in feed	3.25	1.64	2.43

HERD No 2 consists of 15 grade Jersey cows ranging from two to ten years of age. Cows are well cared for and a full blood sire kept. The barn is not well lighted and ventilating facilities are poor. Feed of best cow cost $31.42; poorest cow, $28.75; average of herd, $29.95. Feed: 14 to 40 lbs. silage and 6 to 11 lbs. hay was fed daily to each animal in connection with 4 lbs. ground oats and shorts equal parts by weight during the spring, until May 15th when cows were turned to pasture. For balance of year from October, 3 lbs. oats and barley and corn stover was fed in addition to silage and hay.

The following table shows yearly record of best and poorest cows and average of herd:

	Best cow.	Poorest cow.	Average of herd.
Breed	Jersey	Jersey	
Milking period	10 months	9 months	
Milk, pounds	6263	3414	4464
Fat, per cent	4.8	4.8	5.5
Fat, pounds	304	165	230
Gross returns	$95.35	$48.91	$70.06
Cost of feed	31.42	28.75	29.95
Net profit	63.93	20.16	40.11
Returns for $1.00 expended in feed	3.03	1.70	233

HERD No. 3 is composed of 15 cows of a mixed class or natives, ranging from 3 to 8 years of age. Barn is new, fairly well lighted. A grade sire is kept. Cost of keeping best cow was $30.50; poorest cow, $22.46; average cost of herd $30.16. Feed: 18 to 35 lbs. silage, corn stover 10 to 30 lbs. and 4 lbs. hay was fed daily to each animal in connection with a 5 lb. mixture of barley, oats and corn and cob meal during February and March. From April to May 15th when cows went on pasture, no grain was given. In the fall a limited amount of bran was fed. In the winter barley and corn and cob meal was given in equal parts with the silage and stover.

The following table shows yearly record of best and poorest cows and average of herd:

	Best cow.	Poorest cow.	Average of herd.
Breed	Durham	Durham	
Milking period	10 months	6 months	
Milk, pounds	6237	2256	5003
Fat, per cent	4.2	4.8	4.1
Fat, pounds	266	108	210
Gross returns	$81.11	$31.60	$62.20
Cost of feed	30.56	22.46	30.16
Net profit	50.55	9.14	35.04
Returns for $1.00 expended in feed	2.65	1.40	2.16

HERD No. 4 consists of pure bred and grade Jerseys. Fifteen head were included in this herd at the start, one cow died, one reacted to tuberculin test, and one was sold for a premium on account of its excellent production. Cows are well kept and show fine dairy form. The barn has the King system of ventila-

tion and is fairly well lighted. A pure bred sire has been kept for twenty years and the high average quality of these cows testifies to the wisdom of its management. Cows are kept in the barn during rough and stormy weather. Cost of keeping best cow was $30.67; poorest cow, $26.43; average cost of herd, $31.-14. Feed: 25 to 40 lbs. silage, 3 to 6 lbs. hay and 10 lbs. corn stover was fed daily to each animal. In connection with this, ground oats, gluten, Ajax and oil meal was fed in the spring. Cows went to pasture in May. In the fall, ground oats and barley and for balance of the year bran and barley were given in addition to silage and hay.

The following table shows yearly record of best and poorest cows and average of herd:

	Best cow.	Poorest cow.	Average of herd.
Breed	Jersey	Jersey	
Milking period	11 months	9 months	
Milk, pounds	6456	3957	4868
Fat, per cent	5.0	5.2	5.3
Fat, pounds	329	208	202
Gross returns	$98.98	$63.50	$79.66
Cost of feed	30.77	26.43	31.14
Net profit	68.31	37.07	48.52
Returns for $1.00 expended in feed	3.22	2.40	2.55

HERD No. 5 consists of seven very good average cows, two of them only two years old. They are of no particular breed but show signs of Durham, Jersey and Guernsey. Reasonably good conditions of barn exist. The report shows one of the largest returns per $1.00 fed of any herd in the association. The small cost of keeping, accounts for the large returns. Cost of feeding best cow was $19.97, poorest cow, $20.45; average for herd, $21.02. Feed: In the spring hay, oil meal, corn and oats were fed daily to each animal until turned to pasture May 10th. In the fall 25 lbs. silage and 4 lbs. bran were fed. Only silage was given the balance of the year. This herd made its record largely on pasture, which accounts for its low cost of feed.

The following table shows yearly record of best and poorest cows and average of herd:

	Best cow.	Poorest cow.	Average of herd.
Breed	Jersey	Jersey	
Milking period	10 months	9 months	
Milk, pounds	5523	3959	4826
Fat, per cent	5.3	4.6	4.9
Fat, pounds	298	183	239
Gross returns	$87.96	$53.66	$67.34
Cost of feed	19.97	20.45	21.02
Net profit	67.99	33.21	46.32
Returns for $1.00 expended in feed	4.40	2.62	3.20

HERD No. 6 commenced the year with 9 cows, mostly grade Guernseys. Two of the best cows died of bloat early in the season and three were sold as unprofitable, making the results very disappointing to the owner. Cost of keeping best cow $33.84, poorest cow, $34.75. Feed: 6 to 22 lbs. hay and 6 to 30 lbs. corn stover. In connection with this, oil meal and corn and cob meal was given daily to each animal in the spring until May 11, when cows went to pasture. From July to November, 6 lbs. hay and 4 lbs. bran was given. In November the ration consisted of hay, barley, oats, corn and bran. Stover and corn and cob meal was given balance of year.

The following table shows yearly record of best and poorest cows and average of herd:

	Best cow.	Poorest cow.	Average of herd.
Breed	Guernsey	Guernsey	
Milking period	11 months	12 months	
Milk, pounds	6172	3598	4923
Fat, per cent	4.5	4.9	4.8
Fat, pounds	278	177	239
Gross returns	$83.47	$53.39	$73.85
Cost of feed	33.84	34.77	35.50
Net profit	49.63	18.62	38.08
Returns for $1.00 expended in feed	2.46	1.53	2.07

HERD No. 7 consists of 15 cows, 9 grade Durhams and 6 grade Jerseys. The larger part of this herd was of a beef type, but was fed a better ration than some of the other herds of the association. A grade sire is kept but the owner is considering the

advisability of making some changes in his herd, and will probably purchase a pure bred sire in the near future. Cost of keeping best cow was $31.42; poorest cow, $26.81; average for herd, $29.60. Feed: 20 to 40 lbs. silage, 9 to 30 lbs. corn stover and 4 to 10 lbs. of hay. In connection with this corn, barley and bran, equal parts by weight, were given daily to each animal in the spring until May 20th, when cows went to pasture. Silage was fed in August and September. In the fall and during balance of year 7 lbs. barley and bran mixed were given in addition to silage and hay.

The following table shows yearly record of best and poorest cows and average of herd:

	Best cow.	Poorest cow.	Average of herd.
Breed	Jersey	Jersey	
Milking period	12 months	7 months	
Milk, pounds	6058	2408	4539
Fat, per cent	4.7	4.4	4.3
Fat, pounds	286	106	195
Gross returns	$88.08	$30.77	$58.40
Cost of feed	31.42	26.81	29.60
Net profit	56.66	3.96	28.80
Returns for $1.00 expended in feed	2.80	1.14	1.97

HERD No. 8 is composed of 10 high grade Jersey cows of medium size, ranging from three to eight years of age. They are of good conformation, and show the best of care. Three other cows have been tested for a part of the year, and two were sold at a premium on their records, and one was found unprofitable. A pure bred sire has been kept for 18 years. The barn is clean, well ventilated, but not as light as seems best. Cost of keeping best cow was $26.91; poorest cow, $29.93; average of herd, $27.33. The average cost of feeding as given in the report, $27.33, seems to me to be rather low at the present cost of feed. I will say, however, that care goes a long way in connection with feeds in producing good results. Feed: 12 to 24 lbs. stover was given daily to each animal in connection with three pounds of corn and oats ground, equal parts, and corn and cob meal in the spring until cows went to pasture May 15th. In the fall and during the rest of the year eight pounds ground oats and barley were given in addition to corn stover.

The following table shows yearly record of best and poorest cows and average of herd:

	Best cow.	Poorest cow.	Average of herd.
Breed	Jersey	Jersey	
Milking period	10 months	10 months	
Milk, pounds	7756	4202	6305
Fat, per cent	5.0	4.6	4.9
Fat, pounds	389	194	308
Gross returns	$115.05	$57.13	$92.18
Cost of feed	26.91	29.93	27.33
Net profit	88.14	27.20	64.85
Returns for $1.00 expended in feed	4.27	1.90	3.40

Herd No. 9 consists of 11 head of splendid type, grade and full blood Guernsey cows in fine condition. No lack of care has been shown this herd by its owner who is a strictly up to date dairyman. The cows are fed amounts of feed according to amount of milk given. Cost of keeping best cow $55.38, poorest cow, $36.81; average of herd $46.22. Feed: 3 to 16 lbs. corn stover, 3 to 7 lbs. hay and 22 to 32 lbs. silage. In connection with this equal parts of bran, barley and Unicorn feed was given daily to each animal in February and until May 20, when cows went to pasture. Bran, barley and silage was given during the summer months as pasture was poor. From August to January barley, corn meal and bran was given in addition to roughage.

The following table shows yearly record of best and poorest cows and average of herd:

	Best cow.	Poorest cow.	Average of herd.
Breed	Guernsey	Guernsey	
Milking period	10 months	9 months	
Milk, pounds	9506	4423	6613
Fat, per cent	4.5	5.5	4.8
Fat, pounds	428	243	323
Gross returns	$126.41	$76.61	$98.51
Cost of feed	55.38	36.81	46.22
Net profit	71.03	39.80	52.28
Returns for $1.00 expended in feed	2.26	2.08	2.13

In Herd No. 10 are 15 head of cows of no particular breed, as no pains had been taken to build up along this line heretofore. The signs of Durham and Jersey blood were noticed. A

pure bred sire has however been placed at the head of this herd and three unprofitable cows sold, showing plainly that the owner has derived great benefit from the testing association. There were some very good producing cows in this herd and they would have done a great deal better if they had been fed a heavier ration. Light and ventilation are lacking in the barn. The cost of keeping the best cow in this herd was $30.46; poorest cow, $23.-58; average of herd, $25.32. Feed: 4½ to 18 lbs. corn stover and 5 lbs. hay. In connection with this an 11-lb. mixture of corn and cob meal, barley, oats and bran was given daily to each animal from February to May 15th, when cows were turned on pasture. Barley, bran and oats in addition to the corn stover were fed from November to January.

The following table shows yearly record of best and poorest cows and average of herd:

	Best cow.	Poorest cow.	Average of herd.
Breed	Native	Native	
Milking period	10 months	7 months	
Milk, pounds	5958	2493	4724
Fat, per cent	4.0	4.3	4.2
Fat, pounds	242	108	199
Gross returns	$75.52	$31.29	$59.45
Cost of feed	30.46	23.58	25.32
Net profit	45.06	7.71	34.13
Returns for $1.00 expended in feed	2.47	1.32	2.34

HERD No. 11 is a herd of 12 average sized cows, three of which are grade Guernseys, the rest being natives. Cows were not in first class shape, which would tend to a low production. The barn is not warm and has poor light and ventilation. Cost of keeping best cow, $22.41; poorest cow, $28.17; average for herd, $21.73.

Feed: 5 to 12 lbs. mixed hay and 3 to 6 lbs. June pasture. In connection with this, corn and cob meal and ground oats were given daily to each animal in the spring, until May 1st, when they received a 3-lb. mixture of bran and gluten. Cows were on pasture from May 15th to Nov. 27th. Balance of the year a 5-lb mixture of bran, corn and oats was fed with corn stover.

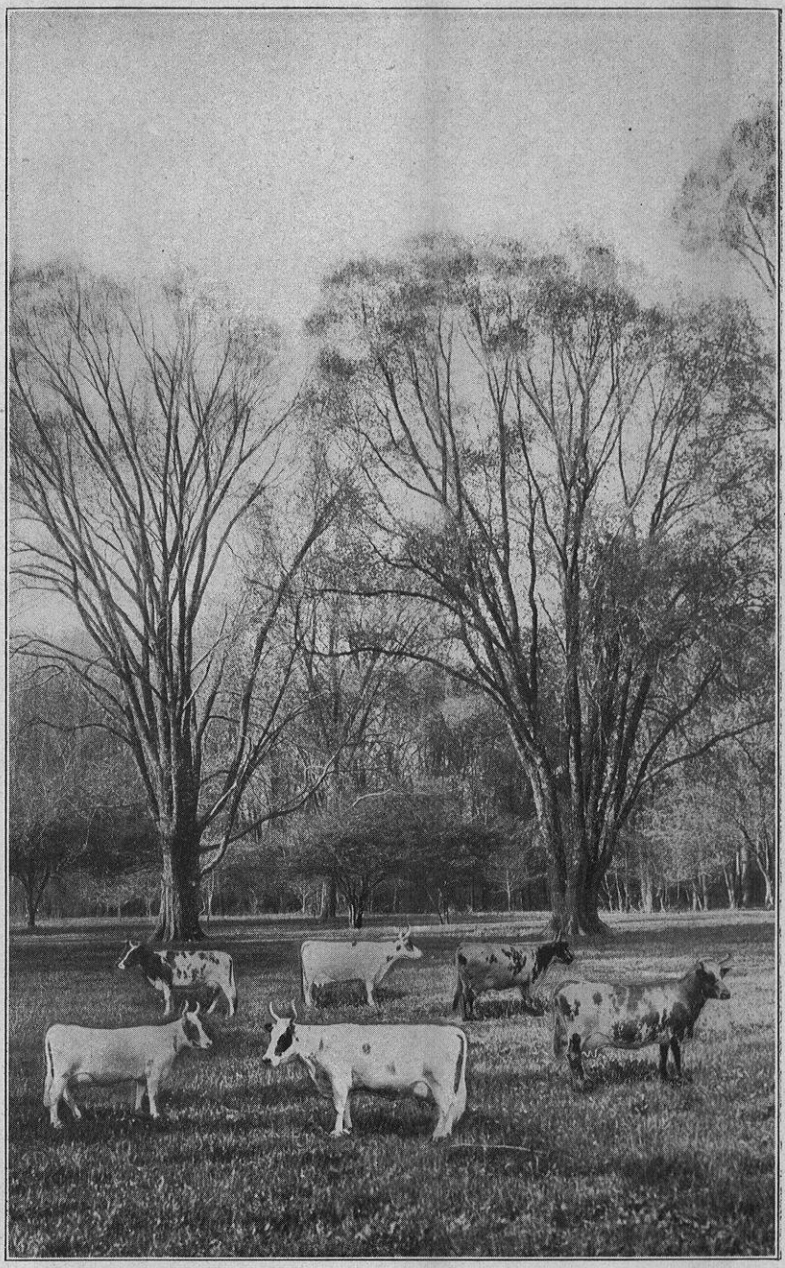
The following table shows yearly record of best and poorest cows and average of herd:

	Best cow.	Poorest cow.	Average of herd.
Breed	Native	Guernsey	
Milking period	11 months	9 months	
Milk, pounds	4522	2,33	3739
Fat, per cent	4.5	4.5	4.4
Fat, pounds	207	123	165
Gross returns	$62.05	$37.09	$49.67
Cost of feed	22.41	28.17	21.73
Net profit	39.64	13.92	27.93
Returns for $1.00 expended in feed	2.76	1.64	2.28

HERD No. 12 consists of 18 cows of which 14 finished the year's work. Of these two are pure bred and the rest high grade Guernseys or Jerseys, with one native. Three cows were disposed of during the year; the year's work of one was not finished at time of report. A pure bred sire has been kept for several years. This herd is in excellent condition showing excellent care and the owner may well be proud of results. Barn is clean, well ventilated, but lacking in light. Cost of keeping best cow was $45.71, poorest cow, $34.56; average for herd, $39.72. Feed: 20 to 40 lbs. silage, 8 to 12 lbs. corn stover and 6 lbs. hay. In connection with this 9 lbs. corn, barley and oats and 4½ lbs. bran and Ajax Flakes were fed daily to each animal in the spring. May 15th cows were turned on grass and received silage throughout the summer. In the fall and rest of the year corn, bran and oil meal were given in addition to silage and stover.

The following table shows yearly record of best and poorest cows and average of herd:

	Best cow.	Poorest cow.	Average of herd.
Breed	Guernsey	Native	
Milking period	12 months	8 months	
Milk, pounds	8182	3634	5774
Fat, per cent	4.1	5.3	4.6
Fat, pounds	342	195	267
Gross returns	$103.97	$56.21	$81.12
Cost of feed	45 71	34.56	39.72
Net profit	58.26	21.65	41.40
Returns for $1.00 expended in feed	2.27	1.62	2.04



PROMINENT AYRSHIRES

Auchenbrack Sweet Pea 2d — Netherhall Jean 3d — Drumsuie Ella
Castlemaine's Nancy — Garclaugh Bloomer 2d — Rena Ross

The highest producing cow in this group has a yearly record of 15,072 lbs. milk and 643.2 lbs. fat; the lowest, 10,920 lbs. milk and 433.33 lbs. fat.

HERD No. 13 consists of eight grade Guernsey and Jersey cows from 2 to 7 years of age. The cows show splendid points and have made a good showing. A pure bred sire is used. The barn is in fine condition with good ventilation and fairly good light. Cost of keeping best cow, $35.39; poorest cow, $27.25; average for herd, $30.90. Feed: 15 to 25 lbs. corn stover and 3 to 8 lbs. hay. In connection with this, bran, oil meal, corn and barley were fed daily to each animal in the spring. May 15th, cows were turned on pasture and during summer months green peas and oats were fed. In the fall a mixture of corn meal, oil meal and cottonseed and in the winter, barley, corn and cottonseed meal was fed in addition to silage, hay and corn stover.

The following table shows yearly record of best and poorest cows and average of herd:

	Best cow.	Poorest cow.	Average of herd.
Breed	Guernsey	Guernsey	
Milking period	11 months	9 months	
Milk, pounds	6360	3549	4441
Fat, per cent	5.0	4.7	4.9
Fat, pounds	319	167	219
Gross returns	$94.14	$48.31	$65.04
Cost of feed	35.39	27.25	30.90
Net profit	58.75	1.06	34.14
Returns for $1.00 expended in feed	2.66	1.77	2.10

HERD No. 14 contains 10 cows, of which 9 are grade Jerseys and one is a grade Guernsey. Nine finished the year's work. They show good care and are very good dairy type. A pure bred sire has been used for several years. The barn is new, clean, well ventilated, and has fine lighting facilities. The cost of keeping the best cow was $37.29, poorest cow, $27.01; average for herd, $31.40. Feed: 27 to 35 lbs. silage, 5 to 10 lbs. stover and 3 to 6 lbs. hay. In connection with this, barley, bran and oil meal were given to each animal in the spring. Cows were pastured from May 10th to November and from then on during the balance of year, bran and barley were given in addition to the roughage.

The following table shows yearly record of best and poorest cows and average of herd:

	Best cow.	Poorest cow.	Average of herd.
Breed	Jersey	Jersey	
Milking period	12 months	12 months	
Milk, pounds	8509	4375	6073
Fat, per cent	4.7	4.5	4.3
Fat, pounds	400	197	295
Gross returns	$121.69	$58.75	$87.51
Cost of feed	37.29	27.01	31.40
Net profit	84.37	31.74	56.11
Returns for $1.00 expended in feed	3.26	2.17	2.78

HERD No. 15 contains 15 head of grade Jerseys, Durhams and native cows of fair dairy type. The cows show good care and some pretty good records. Four of them are three years old, which reduces the average production of the herd. A pure bred Jersey sire is used. Barn is fairly clean but poorly ventilated and lighted. Cost of keeping best cow, $29.27; poorest, $24.07; average for herd, $26.32. Feed: 8 to 10 lbs. hay, 12 lbs. corn stover and 10 to 30 lbs. silage. In connection with the stover and hay, 7 lbs. corn and cob meal, oats and bran, equal parts by weight, were fed daily to each animal in the spring. May 4th cows were pastured. In the fall and the rest of the year 8 lbs. bran and barley was fed in addition to silage and stover.

The following table shows yearly record of best and poorest cows and average of herd:

	Best cow.	Poorest cow.	Average of herd.
Breed	Native	Native	
Milking period	11 months	9 months	
Milk, pounds	7397	3741	4636
Fat, per cent	4.0	4 2	4.5
Fat, pounds	295	160	213
Gross returns	$90.55	$45.22	$64.01
Cost of feed	29.27	24.07	26.32
Net profit	61.28	21.15	37.69
Returns for $1.00 expended in feed	3.09	1.87	2.43

HERD No. 16 contains grades of Jersey, Guernsey and Holderness breeds, of good average size and fair dairy form. The larger part of this herd are two and three year olds which should

be considered in looking over the records. A pure bred Guernsey sire is used and the record of this herd indicates that the owner is on the right road to success. The barn is new and has a good system of ventilation but the light is poor. Cost of keeping the best cow, $27.71, poorest cow, $27.71; average of herd, $27.71. Some of the older cows would have produced better results had they been fed more judiciously. Feed: 20 to 27 lbs. silage, 6 lbs. hay and 6 to 10 lbs. stover in connection with ground oats, barley and corn and cob meal was given daily to each animal. May 15th cows were pastured. The balance of year bran and corn meal was fed in addition to roughage.

The following table shows yearly record of best and poorest cows and average of herd:

	Best cow.	Poorest cow.	Average of herd.
Breed	Guernsey	Guernsey	
Milking period	10 months	7 months	
Milk, pounds	5292	3668	4427
Fat, per cent	4.7	4.2	4.6
Fat, pounds	252	155	206
Gross returns	$76.63	$47.75	$63.77
Cost of feed	27.71	27.71	27.71
Net profit	48.92	20.04	36.06
Returns for $1.00 expended in feed	2.76	1.72	2.30

HERD NO. 17 has 11 cows, 2 of which are grade Guernseys, and the other 9 natives. Ten of this number finished the year's work, and on an average have done very good work. The amount of feed reported seems rather light; however the cows had good care in other respects. The barn is not a modern one, is poorly lighted and rather cold. A pure bred sire is used. Cost of keeping best cow $23.91; poorest cow $24.15; average for herd $24.36. Feed: 9 to 18 lbs. corn stover and 10 to 18 lbs. hay in connection with crushed corn; barley and corn meal was given daily to each animal in the spring. May 15 cows were pastured. In October and November green corn was fed. Balance of year corn and cob meal with barley was fed in addition to stover.

The following table shows yearly record of best and poorest cows and average of herd:

	Best cow.	Poorest cow.	Average of herd.
Breed	Guernsey	Guernsey	
Milking period	10 months	10 months	
Milk, pounds	6093	4399	5008
Fat, per cent	6.0	4.2	4.7
Fat, pounds	368	188	237
Gross returns	$104.23	$54.22	$69.53
Cost of feed	23.91	24.15	24.36
Net profit	80.32	30.07	45.17
Returns for $1.00 expended in feed	4.35	2.24	2.85

Herd No. 18 consists of 18 head of cows, 3 of which are heifers; almost any breed can be found represented in this herd. The barns are poor, ventilation bad, the care of the stables worse, and yet the man acquires money. The cost of keeping the best cow was $37.47; poorest cow, $34.70; average for herd, $34.74. Feed: 12 to 34 lbs. stover and 12 to 24 lbs. hay was fed daily to each animal in connection with crushed corn, oats, bran, barley and oil meal in the spring. May 1st, cows were pastured. For balance of year, corn, oats, barley and stover was fed. In November 9 lbs. potatoes was also given.

The following table shows yearly record of best and poorest cows and average of herd:

	Best cow.	Poorest cow.	Average of herd.
Breed	Native	Native	
Milking period	12 months	8 months	
Milk, pounds	6359	2288	4466
Fat, per cent	4.0	4.8	4.3
Fat, pounds	275	109	195
Gross returns	$82.61	$30.93	$57.29
Cost of feed	37.47	34.70	34.74
Net profit or loss	45.14	-3.77	22.55
Returns for $1.00 expended in feed	2.21	.89	1.64

Herd No. 19 consists of 14 cows, 2 grade Guernseys, 1 native and the rest grade Jerseys. The cows are of a good dairy type and have the best of care; four of them are two and three years old, the poorest cow ten years. Barn is well lighted, warm and clean. Cost of keeping best cow $39.62, the poorest cow, $27.60; average for herd, $34.05. Feed, 22 to 28 lbs. silage, 9 to 12 lbs.

stover and 4 to 12 lbs. hay were fed daily to each animal in connection with 7½ lbs. corn and bran in the spring. One-half pound oil meal was given in February. Cows turned on pasture May 15th. In the fall, silage, corn and bran were given. In the winter, barley, corn, bran and Unicorn feed were given in addition to silage and stover.

The following table shows yearly record of best and poorest cows and average of herd:

	Best cow.	Poorest cow.	Average of herd.
Breed	Guernsey	Jersey	
Milking period	11 months	7 months	
Milk, pounds	6527	2301	5170
Fat, per cent	4.6	4.2	4.6
Fat, pounds	304	98	240
Gross returns	$96.20	$30.21	$73.41
Cost of feed	39.62	27.60	34.05
Net profit	56.58	2.61	39.36
Returns for $1.00 expended in feed	2.42	1.09	2.15

HERD No. 20 is composed of 15 grade Red Poll cows in good flesh; some have made good records. The record of feeds given for the year shows them to be very easy keepers. A pure bred Red Poll sire has been used for a number of years. Barn is warm, ventilated and fairly lighted. Cost of keeping best cow was $23.44, poorest cow $23.12, average for herd, $24.83. Feed: 9 to 18 lbs. hay, 8 lbs. stover and 11 to 18 lbs. silage was fed daily to each animal in connection with 6½ lbs. barley, corn meal and bran in the spring. Cows turned to pasture May 1st. In the fall and winter, ground barley and ground oats in addition to silage and hay was given.

The following table shows yearly record of best and poorest cows and average of herd:

	Best cow.	Poorest cow.	Average of herd.
Breed	Red Poll	Red Poll	
Milking period	10 months	4 months	
Milk, pounds	7227	1756	4898
Fat, per cent	4.0	4.3	4.0
Fat, pounds	294	77	200
Gross returns	$88.25	$25.88	$60.08
Cost of feed	23.44	23.12	24.83
Net profit	64.81	2.76	35.25
Returns for $1.00 expended in feed	3.76	1.11	2.42

HERD No. 21 contains 16 good grade Durham cows of average size and are what is generally considered dual purpose cows. They range in age from 4 to 15 years. One cow was disposed of during the year being found unprofitable; cows show fairly good care and a few good records have been made. A grade Durham sire has been kept. Barn is warm but poorly lighted and ventilated. Cost of keeping best cow was $28.48, poorest cow, $24.68; average for herd, $27.10. Feed: 9 to 12 lbs. hay and 9 lbs. corn meal and bran was fed daily to each animal in the spring. May 15th cows were pastured. Balance of year corn meal and bran was fed with hay and stover.

The following table shows yearly record of best and poorest cows and average of herd:

	Best cow.	Poorest cow.	Average of herd.
Breed	Durham	Durham	
Milking period	12 months	7 months	
Milk, pounds	6566	2247	4919
Fat, per cent	4.3	4.5	4.3
Fat, pounds	289	102	213
Gross returns	$87.00	$31.45	$64.72
Cost of feed	28.48	24.68	27.10
Net profit	58.52	6.77	37.62
Returns for $1.00 expended in feed	3.05	1.27	2.49

HERD No. 22 consists of 26 head of creditable grade Guernsey cows and its owner has reason to feel proud of the high average of its product. The barn is large, roomy, has good ventilation, is clean and well kept. A pure bred sire has been used for several years and a very promising lot of young stock is coming up to still further increase the reputation of the herd. Cost of keeping best cow $33.66, poorest cow $18.01, average for herd $30.74. Feed: 20 to 33 lbs. silage and 3 to 6 lbs. hay was fed daily to each animal in the spring with a pound of a mixture of barley, corn, oats and bran. May 1st cows were pastured, but silage and two pounds grain was given during that month. Same feed was given in the fall and winter as in the spring.

The following table shows yearly record of best and poorest cows and average of herd:

	Best cow.	Poorest cow.	Average of herd.
Breed	Guernsey.	Guernsey.	
Milking period	12 mos.	9 mos.	
Milk, pounds	7483	2750	6023
Fat, per cent	5.0	4.8	4.5
Fat, pounds	378	133	271
Gross returns	$114 54	$38 79	$83 07
Cost of feed	35 66	18 01	30 74
Net profit	80 88	20 78	52 33
Returns for $1.00 expended in feed	3 40	2 15	2 70

HERD No. 23 contains 16 head of average sized native cows, 3 of which are 2 years old; the others range from 3 to 8. A pure bred Guernsey sire is kept and a pure bred 2-year-old heifer was purchased during the year. Cows show good care and good dairy form, several of them showing very good records. Barn is first-class, being warm, well ventilated and pretty well lighted. Cost of keeping best cow, $41.38, poorest cow, $40.77; average for herd, $40.28. Feed: 8 to 16 lbs. corn stover, 10 to 25 lbs. silage and 15 lbs. hay was given daily to each animal in the spring with a mixture of ground oats, barley, oil meal and bran. Cows were pastured from May to August, and 22 lbs. green corn was given with pasture. The rest of year corn, oats and barley was fed with stover and silage.

The following table shows yearly record of best and poorest cows and average of herd:

	Best cow.	Poorest cow.	Average of herd.
Breed	Guernsey.	Guernsey.	
Milking period	11 mos.	8 mos.	
Milk, pounds	7214	3994	5287
Fat, per cent	4.8	5.0	4.8
Fat, pounds	351	200	253
Gross returns	$108 39	$6' 55	$77 76
Cost of feed	41 38	40 77	40 28
Net profit	67 01	21 78	37 48
Returns for $1.00 expended in feed	2 37	1 52	1 93

HERD No. 24 consists of 12 cows of mixed breeds. A pure bred Guernsey sire is kept and some fine young stock is coming forward. There are some very good producers in this herd.

Barn was warm but poorly ventilated and lighted. Cost of keeping best cow, $34.08; poorest cow, $24.55; average for herd, $32.56. Feed: 22 lbs. silage, 6 to 19 lbs. corn stover and 9 to 15 lbs. hay was fed daily to each animal in the spring in connection with ground oats and barley. May 10th cows were pastured. In the fall silage and stover were fed. In the winter barley, bran and oats were given in addition to the roughage.

The following table shows yearly record of best and poorest cows and average of herd:

	Best cow.	Poorest cow.	Average of herd.
Breed	Holstein.	Guernsey.	
Milking period	11 mos.	5 mos.	
Milk, pounds	8241	2037	4994
Fat, per cent	3 6	4 7	4.4
Fat, pounds	310	97	219
Gross returns	$92 40	$26 65	$65 14
Cost of feed	34 08	24 35	32 56
Net profit	58 32	2 31	32 58
Returns for $1.00 expended in feed	2 71	1 17	2 00

Herd No. 25 contains 20 good grade Guernsey and Jersey cows of average size and fairly good dairy type. A pure bred Guernsey sire is kept. Barn is warm, large but poorly lighted and no ventilation. Cost of keeping best cow $22.23; poorest cow, $19.80; average of herd $21.18. My opinion is that more liberal ration of grain would have been both wise and profitable. Feed, 35 lbs. silage, corn stover ad libitum, besides this a 5-lb. mixture of crushed corn and bran, equal parts by weight was given daily to each animal from February to May, when cows were pastured. In November and for remainder of year crushed corn and oats with silage and stover were given.

The following table shows yearly record of best and poorest cows and average of herd:

	Best cow.	Poorest cow.	Average of herd.
Breed	Guernsey.	Jersey.	
Milking period	8 mos.	8 mos.	
Milk, pounds	5206	2077	3258
Fat, per cent	4.6	4.7	4.8
Fat, pounds	242	99	159
Gross returns	$73 87	$30 50	$49 22
Cost of feed	22 23	19 80	21 18
Net profit	51 64	10 70	28 04
Returns for $1.00 expended in feed	3 32	1 54	2 32

HERD No. 26 consists of 16 cows; 12 are pure bred Red Polls and 4 mixed breeding; 2 were sold during the year leaving 14 to complete the year's work. A very even showing has been made in production. Cows have shown fine condition and been liberally fed, and at the right time of the year to produce the best results. A pure bred sire has been kept for several years. Cost of keeping best cow, $40.72; poorest cow, $33.92; average for herd, $36.90. Feed: 7 to 30 lbs. silage, and 3 lbs. hay was given daily to each animal in the spring in connection with barley meal, bran and oil meal. Cows turned to pasture in early May. Some silage was given in dry season. In the fall and winter an 8½ lb. mixture of equal parts of bran, oats and barley was given with stover in addition to above roughage.

The following table shows yearly record of best and poorest cows and average of herd:

	Best cow.	Poorest cow.	Average of herd.
Breed	Red Poll	Red Poll	
Milking period	12 mos.	8 mos.	
Milk, pounds	7517	3947	6381
Fat, per cent	4.7	4.9	4.3
Fat, pounds	356	184	273
Gross returns	$106 34	$56 47	$83 17
Cost of feed	40 72	33 92	36 90
Net profit	65 62	22 55	46 27
Returns for $1.00 expended in feed	2 25	1 66	2 25

HERD No. 27 started out with 17 head of pure bred Guernsey cows, 9 of which were withdrawn from the test to be placed in advanced registry work. Of the eight cows which continued in the test 4 were two-year-old heifers and the rest from 3 to 6 years old. These cows are of excellent form and dairy type and show splendid care. A pure bred sire has been kept for twenty years. Barn conditions are ideal in all respects and the cows are kept in the barn from the close of the pasture season till time to turn out on grass in the spring, with fresh water placed in front of them once a day. The cost of keeping best cow was $47.51, poorest cow $33.47; average for the herd $41.29. Feed: 3 to 8 lbs. hay, and 25 to 40 lbs. silage, also corn stover. In connection with this, Ajax Flakes, corn and oats was given daily to each animal during February; in March and April corn meal, alfalfa meal and bran; in May cows were pastured receiv-

ing in addition Ajax Flakes in May, ground corn and oats and bran in June and July and 20 lbs. silage in August and September. In early winter Unicorn feed, ground barley, oats and bran was fed in addition to roughage. In January Unicorn feed was changed to Ajax Flakes.

The following table shows yearly record of best and poorest cows and average of herd:

	Best cow.	Poorest cow.	Average of herd.
Breed	Guernsey	Guernsey	
Milking period	11 mos.	10 mos.	
Milk, pounds	7342	3536	6022
Fat, per cent	5.0	5.6	4.6
Fat, pounds	369	198	291
Gross returns	$115 34	$58 72	$89 81
Cost of feed	47 51	33 47	41 22
Net profit	67 83	25 25	48 59
Returns for $1.00 expended in feed	2 42	1 75	2 17

Discussion.

Mr. Jacobs: I don't understand how that man got $1.50 for a dollar's worth of feed and not feed more than $19.80 per cow. I never have been able to do that.

Mr. Searles: That is the feed of the poorest cow, the best cow was $22.23. The best cow was fed from February 1st to May 10th, silage 35 pounds; stover, crushed corn and bran, equal parts, by weight, 5 pounds, and pasture only during the summer months. In November and for the remainder of the year, silage 35 lbs., stover 7 lbs., and 3½ lbs. crushed corn and oats.

A Member: How much do you calculate for the labor in handling a cow a year?

Mr. Searles: We offset that with the skimmilk, the calf and the manure. There are a good many of these that made their records mostly on pasture.

Mr. Aderhold: And also on the high prices for the product?

Mr. Nye: The prices are all based on two cents above Elgin.

Mr. Searles: You will note there are not many of these herds that have been fed very much above $30 worth.

A Member: Did the poorest cow milk in the winter months?

Mr. Searles: She was milked mostly in the summer and received very little grain.

A Member: What breed was the poorest cow?

Mr. Searles: It was a grade Jersey.

Mr. Jacobs: I believe we have been looking for something for nothing for a long time and as near as I can tell we have found it, because this cow has only been fed enough really to keep her alive and she has kept alive and done something besides.

Mr. Rawl: It seems to me it would throw some light on this question if we were to consider that the rates of all these feeds are very low. I would like to know how the gentleman made those ratings of pasture and silage, etc.

Mr. Searles: A board of directors was appointed when the association was organized and they set the prices on the feeds, taking the commercial value at that time, and they put $1.00 per month on pasture. There are other places in this state where they charge $1.50, and I think that is nearer right.

Mr. Rawl: And on silage?

Mr. Searles: Two dollars and fifty cents a ton.

A Member: What is your land worth around here that you can only charge a dollar for pasture?

Mr. Searles: It is considered worth $100 an acre.

Mr. Goodrich: My idea of fixing a price on anything is just what you can sell it for, or what you will have to give for it when you buy it, and the question is, will the farmers rent their pasture for a dollar a month?

Prof. Woll: I would call your attention especially to two herds, 9 and 10; herd No. 9 produced on the average 323 pounds of butter fat, and the feed of those herds was worth $46, while No. 10 produced 199 pounds of butterfat and the feed cost $59. The last column of the table shows that there was more money produced from the poor herd.

Mr. Goodrich: More per cent.

Prof. Woll: There can be no doubt in the mind of any dairy farmer that No. 9 is the better herd, and yields the farmer more money, so I think that when the last column shows an advantage the other way, it is evidently due to some error in your calculation and especially in figuring pasturage. Will you give us some details as to those two herds?

Mr. Rawl: In that particular case one cow was fed $46 worth of feed and returned a profit of $52. In the other case the cow was fed only $29 worth of feed and returned a profit of $34.

Now, the question arises, is it better to feed a cow $46 worth of feed and get back $52, or to feed her $29 worth and get back $34. In the case where you get back $34 it costs you 14 cents a pound to produce and in the other case it costs you 13 cents, but the question comes down to this, is it better to produce 300 pounds of fat at 14 cents a pound, or 200 pounds at 13 cents? Now, the smaller margin on the larger number is done in that particular case, the vital point is that where you feed $46 worth of feed you get $52 clear profit, and where you feed $29 worth of feed you only get $34 profit, and I believe if you analyze that more carefully, you will find more actual dollars profit, even if the cost is higher at the end of the year.

Mr. Searles: I ought to say with respect to No. 9 that pasture was poor and the owner said he fed heavier feeds than perhaps he ought to have fed through the summer months.

Mr. Nye: Isn't that an indication of lack of judgment in the man who feeds too much?

A Member: There is another suggestion, that man that fed $46 worth of feed got more returns in the shape of manure, a very important proposition.

Mr. Goodrich: And he didn't do but a very little more work, and that is a point overlooked to a certain extent. The man that only fed the $29 worth to his cow had to take care of her, he had to stable her, had to do almost as much work as in the other case, milking and taking care of the milk, etc., and the profits right through were very much smaller.

A Member: Why don't you figure in the depreciation of the animal in giving the net profits of the cow?

Mr. Searles: I am afraid if we got any more figures that the average farmer would not grasp them. Of course to be absolutely correct those figures would be necessary.

REPORT OF COW CENSUS.

H. W. GRISWOLD, West Salem.

When I began the cow census, I was at once filled with deep curiosity, for though I was born and brought up in the same community, I had no idea how my neighbors fed their cows. To be sure, I knew they fed hay and corn stover, but aside from that I knew nothing. So it was with much interest that I got the facts which gave me the accompanying table. Each farmer that I visited is given a number which appears in the first column.

The first question I asked was how many cows the herd averaged for the year and how many heifers. I thought it best to make a little distinction, as a heifer is not as good as a cow, and a large percentage of heifers would make a difference in the yield per cow. You will notice in the case of Nos. 12, 13 and 20 that one-third or over were heifers with first calves. I think every man gave me the honest number he had but when no account is kept, it is hard to make a correct mental estimate of a period of a year. In some cases, as in the larger herds, it might vary a cow or so one way or the other. Most of the farmers let the bull run with the herd and the cows calved at any time during the year. A few had fall cows and a few winter cows. The bulls that were used by these patrons were an inferior lot. Only one used a pure bred animal, the rest used a grade or a scrub, which, in some cases, was descendant of beef cattle. One of the questions asked, but not in the table, was, what farm papers were read. Many took two or three farm papers, two Hoard's Dairyman, and one depended on the local paper for agricultural information.

Now as to the feed. Every farmer had pastures and on the average this was charged at $1 per month per cow. A few fed grain or silage during the summer but most of them depended entirely on the pasture for the summer feeding. Now winter feeding—and here is where I got the variations. Most all fed hay and all a cow wanted. Number 2, however, is an exception as his cows had no hay whatever. Others had hay only part of the winter. When the cow had no silage, but was given what

hay she wanted, I figured she would eat about 20 pounds a day and at the rate of $4 a ton for the six months winter feeding this would come to $7.20. In most instances the hay was made part clover and part timothy. Almost every herd had shredded corn stalks. Number 2 depended entirely on this for roughage. A large amount of the stover fed was wasted and was used for bedding. I tried to get at the amount the cow ate and charged her at the rate of $3 a ton for it. This made a small feed bill, seldom over $2. Only five had silos. Number 1 fed in winter 35 lbs. a day and 20 lbs. a day in the summer. Number 8 fed 35 lbs. in winter. Numbers 18 and 19 fed 30 lbs. a day during winter. Number 20 said his cows ate 50 lbs. a day, and he weighed it, and that they ate all the hay they wanted which was very little.

The grain fed was mostly home grown but in a few instances bran was used. It was with some difficulty that the amount was found, as none of the farmers had ever weighed their feed. In many places a four or six-quart pan was used and by that could be judged the number of quarts, which were later converted into pounds. Nearly every farmer fed corn and cob meal and oats or barley. The largest grain feeder, Number 5, fed fourteen pounds of grain a day, all corn and cob meal. The smallest feeder in grain, Number 12, fed about two pounds a day, corn and cob meal and oats. The roughage fed by these two men was the same, and all the difference in cost, $16.20, comes in the grain ration.

Through the courtesy of the creamery officers I was able to get the returns which these men received from the creamery, and from these figures I calculated the average production per cow for the past year. This varies from 50 pounds in the case of Number 4 to 181 pounds in the case of Number 24. Number 4's cows were poorly housed while those of Number 24 had a good barn and received good care though they were not fed nearly as heavy as some other herds. Numbers 1 and 25 were greatly troubled with abortion and that accounts for their low production, for the cows were well fed and housed.

In "Returns for each $1.00 worth of feed fed" we find Number 24 in the lead. This herd was of the dairy type, all either Guernsey or Jersey grades, with but one exception, a grade Shorthorn. He sold only the poorest cows and raised all the heifers.

In the Profit or Loss column we find what the farmer should

look for. This varies from $8.01 loss per cow to $35.01 profit per cow. I have already described Number 24's herd which leads in profit. Next to his is Number 7 who received $21.00 profit per cow. He had very good looking cows, of dairy type. His stable was warm and Sugarota Dairy Feed was added to the winter ration. Number 4 suffered the greatest loss per cow, which amounted to $8.00 less than he could have gotten for the feed at the warehouse.

Of a great many I asked the question, Are your cows getting better? Many said, "about the same." Some said their cows were getting poorer and only two, Numbers 24 and 18, felt that their herd was improving. The trouble seemed to be that the cows were kept for butter production but were bred for beef or nothing.

The following table gives the results of the twenty-five herds which I visited:

No. of patron	Cows.	Heifers.	Breed.	When calved.	Cost of keep.	Returns per cow.	Lbs. fat per cow.	Returns for $1.00 in feed.	Profit or loss.
1	22	2	Jerseys	A	$36 80	$48 00	150	$1 30	$11 20
2	11	3	Mixed stock	A	22 20	43 00	134	1 90	20 80
3	14	4	Mixed stock	A	24 80	43 00	134	1 73	18 20
4	3	1	Mixed stock	A	24 50	16 47	50	67	—8 03
5	15	3	Common stock	F & S	36 60	37 30	116	1 01	70
6	15	3	Common stock	F	31 20	40 60	126	1 30	9 40
7	16	4	Common stock	W	27 80	48 80	152	1 75	21 00
8	20	5	Common stock	W	34 30	35 30	110	1 02	1 00
9	15	3	Durham	A	27 30	27 00	84	90	— 30
10	10	2	Common stock	A	24 00	22 88	71	95	—1 12
11	11	1	Mixed cattle	A	24 20	37 63	117	1 55	13 43
12	12	5	Common stock	S	20 40	23 27	75	1 14	2 87
13	8	4	Grade Durham	A	24 00	36 04	112	1 50	12 04
14	12	2	Common stock	A	28 60	33 30	104	1 17	4 70
15	9	0	Common stock	W	26 05	28 70	89	1 10	2 65
16	11	2	Grade Durham	S	25 00	20 70	64	82	—4 30
17	6	0	Mixed cattle	F	33 80	53 97	168	1 59	20 17
18	14	4	Grade Durham	F	33 00	47 82	149	1 44	14 82
19	9	3	Grade Durham	F	32 00	26 16	81	81	—5 84
20	5	3	Common stock	W	34 10	36 95	115	1 08	2 85
21	10	2	Purebred Durham	A	26 00	46 68	145	1 79	20 68
22	10	2	Common stock	A	22 20	31 54	98	1 42	9 34
23	15	2	Grade Durham	A	23 60	34 98	109	1 48	11 38
24	13	5	Mixed cows	A	23 10	58 11	181	2 51	35 01
25	14	4	Mixed cows	A	26 90	43 90	137	1 63	17 00

DISCUSSION.

Mr. Goodrich: How was this cow census taken?

Mr. Griswold: We drove from house to house, visited nearly every farm and the farmer himself gave us the facts as to the feeding and the care of the herd. The production of fat was figured from the creamery returns, it was all gathered cream.

A Member: In that herd where there was a loss of $8 per cow, how much did you figure the calf?

Mr. Griswold: The calf is not figured in this at all. I think the calf in many cases was not worth anything.

The Chairman: I suppose a lot of these gentlemen here are saying, "Lord, is it I?" What kind of a sire was used in that bunch, No. 4?

Mr. Griswold: A grade Shorthorn.

Mr. Searles: Were these farmers among our patrons in the testing association?

Mr. Griswold: No, I had to skip the best farmers, because they were in the testing association. As to No. 4, that owner took one general farm paper, fed his cows once a day 7 qts. of half barley and half oats, as his grain ration. You will notice there is quite a difference, No. 12 kept his cows for $20.40 while No. 5 fed $36.60 worth, and the difference was practically all in the grain that they fed their cows during the winter months. They fed the same hay and stover. Neither had a silo.

Mr. Goodrich: Now, it cannot be supposed that these figures are exactly accurate, but they surely indicate something. Of course, I don't know just the methods Mr. Griswold took to find out the amount of feed but I presume it was done pretty well.

Taking into consideration all the possible inaccuracy, I think there is a great deal to be learned in cow census, and I am sure we can start improvements by it. I have had some interesting experience in noting how men look at these cow censuses; a man cannot pick out his herd by the number. They will look along down and see the herds that had about so many cows, and he had about that same number of cows, and he looks along and sees that in one such herd the production is small and he will say to himself, "That isn't mine". I remember one

man saying, "I will do better than that another year, or I will kill every cow I have," and I kept track of some of those men and they did do a great deal better the next year. That is what this cow census did.

Mr. Rawl: There is one point in this whole matter we ought not to miss. Whether those figures are accurate or not, the fact remains that only one herd has returned to the farmer as much as $58 per cow, and some run as low as $16, $18 and $20 per cow. Now, look at the composition of those herds. That is an important question, a very vital point in the whole business. If we are going to have cows at all, we must maintain a herd that will bring us in a decent gross return, bigger than most of those are. Taking the price of butterfat this year,—and it was good—the best herd there only returned $58 per cow, and that herd doesn't average over 200 pounds of butterfat.

Now, gentlemen, there is no use in talking about it, you can take all the data available in this whole country,— and there is lots of it,—and you will not find profitable dairy herds in any part of the United States that do not have a higher average production per cow than is shown in any herd in that table. If we are going to operate in dairying for money, then we must get rid of those mixed herds; we must get dairy cattle suited to the production of 300 pounds of fat a year when they are fed properly, and there isn't a single herd in that whole bunch anywhere near that.

Now, somebody said something about overfeeding. I don't like to hear that mentioned, because there are about 99¾ per cent of men who underfeed their cows where there is one quarter of one per cent that overfeed. Let us not miss these important points. We have to have a herd that will produce more than $58 gross returns, and they should produce at least $90 and when we get $90 from each cow, we can deduct from that a good big feed bill, and still have a good business profit.

Mr. Aderhold: I would like to ask Mr. Griswold what were the average returns from his own cows last year?

Mr. Griswold: One hundred and fifteen dollars.

Mr. Rawl: There you are, gentlemen. You see it can be done. What was the average creamery price for butterfat?

Mr. Griswold: Thirty-two cents, and the average cost of feed per cow in our herd was $44.

Mr. Glover: There is another thing to be considered in this cow census, whether those figures are exactly right or not. You will notice in Herd 16 the owner received from the factory $20 per cow, and there were eleven cows in the herd; in Herd No. 1 there were twenty-two cows and the owner received $48 per cow. In other words, No. 1 received more than twice as much per cow from the creamery. Why? We don't know, unless this man had better cows. Those figures are perfectly correct, because that is the return the owner received from the material that went to the creamery. Why that difference? It is in the man and the cow. The cow census taker said there wasn't but one pure dairy sire used among these 25 farmers. Now, why are we trying to get butterfat from an animal that isn't bred for that purpose? If you were going out on the race track to win a race, would you take an animal that was bred for drawing loads, or would you take one bred for speed? In selecting horses you select those that can fulfil the function you wish performed. You do that everywhere except in dairying. Many, many dairy farmers think that they can combine two functions in one animal, that they can get a splendid beef animal and a splendid dairy animal in one creature, but the two functions do not harmonize any more than speed and draft go together.

A bull dog is a fighting machine; the hound is a running machine. You can clearly see the difference in their conformations. Realizing this, why do dairymen select a sire not bred for dairy purposes? When the farmer chooses dairying as a business, why not breed so as to produce the kind of animal that has been bred for generation after generation to produce milk the most economically? If you have a pure bred sire and you breed to common cows, you will produce half pure bred cows, and then breed him back to his daughters and the resulting generation is three quarters pure bred.

Do not try to make meat with a dairy cow, or milk with a beef cow. If you are in the meat business, select a beef breed; if you are in the dairy business, get an animal bred for dairy work.

COW INDEX OF KEEP AND PROFIT

By W. J. Fraser, Professor Dairy Husbandry, University Illinois, Urbana.

How much is this cow worth? And that one?

How much milk and how much butterfat does she produce per year?

What profit will she return each year?

What is the cost of her feed for one year? Of the labor? What are the other expenses and depreciation?

What is the value per year of the skim milk? Of the manure?

Will the skim milk, calf and manure pay all expenses except feed?

These are vital questions (financially) for every dairyman, concerning every individual cow in his herd. If he will answer the second question, the table will answer the other nine. It is a ready reckoner of cow economics.

The efficient cow is the chief factor in making money on a dairy farm. Good dairying is one of the most remunerative lines of farming, and for this reason even poor, unbusiness-like dairying may result in some gain. As a rule the average, or even the best dairymen, neither know nor suspect the extent to which the profit or loss from each individual cow affects the profit received from the whole herd. The profit on the good cow covers up the loss on the poor ones, and thus the owner fails to see how easily and to what extent the profits could be increased by simply disposing of a few poor cows. If the largest returns are to be obtained, it is necessary to weed out the unprofitable cows from the herd. This testing and weeding out of the unprofitable cows has been advocated for several years. Test associations for this purpose have been recently started in all the most prominent dairy countries of the world. Hoard's Dairyman, thru its valuable cow census work, has shown clearly that many herds in different sections of the United States are kept at an actual loss. The Department of Dairy Husbandry at University of Illinois has published no less than ten bulletins and circulars on

this subject in the past five years. But for all that, both the dairymen and the public have not realized the full significance of this work. The reason so many herds are kept at an actual loss or little profit is because a man with a large herd of poor cows may receive a large check at the end of each month, but he does not see the large expense bill that must be subtracted from this. The total receipts must not be looked upon as the net profit.

In an attempt to bring out these facts more clearly, and to save the dairymen much figuring, the following table has been worked out. This table is based on the experience and findings of the Department of Dairy Husbandry during the past thirteen years. To illustrate the use and value of this table, it is here applied to the yearly records of the individual cows of 5 herds taken from the many herds which have been tested by this department.

This table and its application to herds proves that many men are, twice each day, milking cows that are not paying for the feed they eat. Yet the laborious task is continued, year after year, in the vain attempt to make money with a class of cows utterly unable to return a profit. The game of making money with inefficient cows is absolutely blocked, yet many dairymen are so busy milking these poor cows that their vision is apparently bedimmed, and they cannot see the ultimate outcome. One might as well pay his entry fee and attempt to win a race in the 2:10 class with a draft horse that could not go a mile in five minutes, as to attempt to make money with some of the cows that are being milked. Just think of the "Wasting of years of weary, unprofitable toil" on our dairy farms in doing all the labor of preparing the ground, planting, cultivating, harvesting and storing the crops, only to dispose of the feed to a dairy herd in which many of the individual cows are kept at an actual loss. All of this waste of labor and energy might easily be obviated if intelligence and common sense were used in establishing and breeding up an efficient dairy herd. To present and impress the facts of profit and loss in the herds as they are today, is the object of this table and its application.

TABLE 1.—*Based on Averages from Classes of Cows of Different Production, Considering Their Value, Production, the Cost of Keep and Income from Products.*

1. Value of cow at first freshening	$30.00				$35.00				$40.00				$45.00	
2. Value of cow for beef at end of life	30.00				29.00				27.00				25.00	
3. Difference, or depreciation during life	0.00				6.00				13.00				20.00	
4. Pounds milk produced	2000	2250	2500	2750	3000	3250	3500	3750	4000	4250	4500	4750	5000	5250
5. Pounds skim milk, 85 per cent of whole milk	1700				2550				3400				4250	
6. Value of skim milk at 20c	$3.40				$5.10				$6.80				$8.50	
7. Value of each calf (Bull $3, Heifer $3) (Average $3)	3.00				3.00				3.50				4.00	
8. Value of manure at an average price of $1.50 per ton	13.50				14.00				14.50				15.00	
9. Total value of skim milk, calf and manure	$19.90				$22.10				$24.80				$27.50	
10. Cost of labor	$17.00				17.50				$18.00				$18.50	
11. Interest, taxes, insurance and repairs on barn	4.00				4.00				4.00				4.00	
12. Service fee	2.00				2.00				2.00				2.00	
13. Interest, depreciation on cow	1.50				2.62				3.89				5.15	
14. Veterinary service, medicine, and spraying materials	.20				.30				.40				.50	
15. Depreciation on dairy utensils	.60				.65				.70				.75	
16. Total expense of labor, housing, service fee, interest and depreciation on cow and utensils	$25.30				$27.07				$28.99				$30.90	
17. Does skim milk, calf and manure pay labor, interest and depreciation on cow?	-$5.40	-$5.29	-$5.18	-$5.07	-$4.97	-$4.77	-$4.58	-$4.38	-$4.19	-$3.99	-$3.79	-$3.60	-$3.40	-$3.13
18. Pounds butter fat in 4 per cent milk	80	90	100	110	120	130	140	150	160	170	180	190	200	210
19. Value of butter fat at 27 cents per pound	$21.60				$32.40				$43.20				$54.00	
20. Cost of feed for cow	34.00				36.09				38.00				40.00	
21. Profit from butter fat over feed	-$12.40	-$10.20	-$8.00	-$5.80	-$3.60	-$1.40	$ .80	$3.00	$5.20	$7.40	$9.60	$11.80	$14.00	$16.20
22. Total year's profit per cow	*-$17.80*	*-$15.49*	*-$13.18*	*-$10.78*	*-$8.57*	*-$6.17*	*-$3.78*	*-$1.38*	*+$1.01*	*$3.41*	*$5.81*	*$8.20*	*$10.60*	*$13.07*

TABLE 1 Continued—*Based on Averages From Classes of Cows of Different Production, Considering Their Value, Production, the Cost of Keep, and Income From Products.*

1. Value of cow at first freshening			$50.00				$30.00				$70.00			
2. Value of cow for beef at end of life			25.00				25.00				25.00			
3. Difference, or depreciation during life			25.00				35.00				45.00			
4. Pounds milk produced	5500	5750	6000	6250	6500	6 50	7000	7250	7500	7750	8000	8250	8500	8750
5. Pounds skim milk, 8 per cent of whole milk			5100				5950				6800			
6. Value of skim milk @ 20c			$10.20				$11.90				$13.60			
7. Value of each calf { Bull / Heifer } Ave			$3 / 6 4.50				$3 / 8 5.50				$3 / 10 6.50			
8. Value of manure at an ave. price of $1.50 per ton			15.50				16.00				16.50			
9. Total value of skim milk, calf and manure			$30.20				$33.40				$36.60			
10. Cost of labor			$19.00				$19.50				$20.00			
11. Interest, taxes, insurance and repairs on barn			4.00				4.00				4.00			
12. Service fee			2.00				2.00				2.00			
13. Interest, depreciation on cow			6.14				8.10				1 .06			
14. Veterinary service, medicine, and spraying materials			.60				.70				.80			
15. Depreciation on dairy utensils			.80				.85				.90			
16. Total expense of labor, housing, service fee, interest and depreciation on cow and utensils			$32.51				$35.15				$37.76			
17. Does skim milk, calf and manure pay labor, interest and depreciation on cow?	-$2.87	-$2.60	-$2.34	-$2.19	-$2.04	-$1.90	-$1.75	-$1.60	-$1.45	-$1.31	-$1.16	-$1.00	-$0.84	-$0.68
18. Pounds butter fat in 4 per cent milk	220	230	240	250	260	270	280	290	300	310	320	330	340	350
19. Value of butter fat at 27c per pound			$64.80				$75.60				$86.40			
20. Cost of feed for cow			42.00				44.00				46.00			
21. Profit from butter fat over feed	$18.40	$20.60	$22.80	$25.00	$27.20	$29.40	$31.60	$33.80	$36.00	$38.20	$40.40	$42.60	$44.80	$47.00
22. Total year's profit per cow	*$15.53*	*$18.00*	*$20 46*	*$22.81*	*$25.16*	*$27.50*	*$29.85*	*$32.20*	*$34.55*	*$36.89*	*$39.24*	*$41.60*	*$43.96*	*$46.32*

TABLE 1—Continued—*Based on Averages from Classes of Cows of Different Production, Considering Their Value, Production, the Cost of Keep, and Income from Products.*

1. Value of cow at first freshening...	$80.00				$90.00				$100. 0				$110.00
2. Value of cow for beef at end of life	25.00				25.00				25.00				25.00
3. Difference, or depreciation during life	$55.00				$65.00				$75.00				$85.00
4. Pounds milk produced	9000	9250	9500	9750	10000	10250	10500	10750	1100:	11250	11500	11750	10200
5. Pounds skim milk, 85 per cent of whole milk	7650				8500				9350				12000
6. Value of skim milk at 20c	$15.30				$17.0				$18.70				$20.40
7. Value of { Bull / each calf { Heifer / { Average	$ 3 / 13 { 8.00				$16 / 16 { 16.00				$20 / 20 { 20.00				$24 / 24 { 24.00
8. Value of manure at an average price of $1.50 per ton	17 00				17.50				18.00				18.50
9. Total value of skim milk, calf and manure	$ 0.30				$50.50				$56.70				$62.90
10. Cost of labor	$21.00				$22.00				$23.00				$24.00
11. Interest, taxes, insurance and repairs on barn	4.00				4.00				4.00				4.00
12. Service fee	2.00				2.00				2.00				2.00
13. Interest, depreciation on cow	11.98				13.97				15.95				17.89
14. Veterinary service, medicine, and spraying materials	.90				1.00				1.10				1,20
15. Depreciation on dairy utensils	.95				1.00				1.05				1.10
16. Total expense of labor, housing, serving fee, interest and depreciation on cow and utensils	**$40.83**				**$43.97**				**$47.08**				**$50.19**
17. Does skim milk, calf and manure pay labor, interest and depreciation on cow?	**$-.53**	**$-.39**	**$-.25**	**$-.10**	**+$6.53**	**$7.30**	**$8.07**	**$8.85**	**$9.62**	**$10.39**	**$11.16**	**$11.94**	**$12.71**
18. Pounds butter fat in 4 per cent milk	360	370	380	390	400	410	420	430	440	450	460	470	480
19. Value of butter fat at 27c per pound	$97.20				$108.00				$118.80				$129.60
20. Cost of feed for cow	48.00				50.00				52.00				54.00
21. Profit from butter fat over feed	**$49.26**	**$51.40**	**$53.60**	**$55.80**	**$58.00**	**$60.20**	**$62.40**	**$64.60**	**$66.80**	**$69.00**	**$71.20**	**$73.40**	**$75.60**
22. Total year's profit per cow	*$48 67*	*$51.01*	*$53.35*	*$55.70*	*$54.53*	*$57.50*	*$70.47*	*$73.45*	*$76.42*	*$79.39*	*$32.36*	*$85.34*	*$88.31*

How to Use The Table.

This table shows how the profit differs with cows differing in production from 2000 to 15,000 pounds of milk per year. There is a column of figures for each increase of 250 pounds of milk. To find the profit or loss of any individual cow, it is only necessary to follow line 4 to the column having the number of pounds of milk nearest to the production of the cow; run down the column to line 17, the first figures in large black type, and note these. Begin again on line 18, following it to the figures that correspond the nearest to the pounds of butterfat produced by the cow; go down this column to line 21, the second figures in large black type. The sum of these two amounts in large black type gives the total year's profit or loss from the cow. The reason that the cost of feed should be based on the figures found in the column with the butterfat, and not in the column with the milk, is because cows producing rich milk require more feed per hundred pounds of milk than cows testing low in butter fat.

As an example of how to use Table 1, the returns from the first cow in herd No. 1 are here figured. She produced 4191 pounds of milk and 122 pounds of butterfat. In line 4 find the number of pounds of milk nearest that produced by the cow, which in this case is 4250. Follow down this column to line 17, the first figures in large black type, which are—$3.99. Beginning again on line 18, follow it to the figures that correspond the nearest to the pounds of butterfat produced by the cow, which in this case are 120. Go down the column to line 21 and find the next figures in large black type,—$3.60. The sum of these two amounts—$3.99 and—$3.60, is—$7.59, the total year's loss from this cow.

As a second example, the last cow in herd No. 1 gave 6606 pounds of milk and 254 pounds of butterfat. Her milk production places her in the column headed 6500 pounds of milk, resulting in a loss of $2.04, as shown in the large black type, line 17. Her production of butterfat—254 pounds—places her in the 250 pound class, showing a profit of butterfat over feed of $25.00 line 21. The sum of this $25.00 and the—$2.04 previously found in line 17, is $22.96—the total year's profit for this cow.

Detailed Explanation of Table.

These figures in Table 1 are based upon conditions as they exist today, which in many cases are far below the ideal.

The price for the product is considered at the market value of butterfat at the creamery, and this price should be obtained by any dairyman in the state, no matter what his location. If the milk were shipped to a city for direct consumption, retailed directly to the consumer, or cream sold for a fancy trade, the returns would be much greater than indicated in the table.

The production per cow is the average for six years,—the length of time cows are milked in most herds. Altho some cows produce for twice this length of time, there are also many which drop out after only one or two years' production.

These figures are based upon definite data worked out at the Experiment Station, but the results will fluctuate slightly, according to the way the herds are fed. The price of feed varies in different years, but as a rule the price of the product varies with the feed, so that this fluctuation is small. When a dairyman uses this table, the question is not whether the results obtained are absolutely correct to a few cents, as it makes no special difference to a farmer whether a cow brought in a profit of $10 or $10.50, but it does make an enormous difference whether she lost him $5, or made him $20 as may be easily done by ordinary cows producing within the range of many cows in the average herd.

To illustrate the use of Table 1 and to show what is the trouble with many of our dairymen, and how the difficulty may be remedied, the profit, based upon the actual production of five herds which have tested for an entire year by this department, has been figured out according to Table 1.

The following tables are not merely a lot of cow records, but the results in black faced type are interpretations of cow records in terms of profit and loss. The results speak largely for themselves, but a brief discussion follows each herd.

TABLE 2.—*Herd No. 1.*

No. cow.	Age.	Lb. milk.	Lb. fat.	Percent fat.	Profit.	Loss.
1	3	2496	102	4.09		$13.18
2	5	3158	107	3.39		10.57
3	13	3369	110	3.27		10.57
4	7	4178	121	2.90		7.59
5	3	3389	123	3.63		8.18
6	15	3349	124	3.70		8.37
7	3	3036	124	4.08		8.57
8	6	3415	125	3.65		5.98
9	6	3947	128	3.24		5.59
10	8	3438	132	3.84		5.98
11	3	3263	133	4.08		6.17
12	8	3435	134	3.90		5.98
13	3	3547	145	4.09		1.58
14	8	3686	149	4.04		1.38
15	3	2429	151	6.22		2.18
16	8	3922	157	4.00	$1.01	
17	4	3612	158	4.37	.62	
18	8	4185	158	3.78	1.24	
19	8	4296	161	3.75	1.21	
20	4	4328	168	3.88	3.41	
21	6	4131	170	4.12	3.41	
22	11	4290	175	4.08	5.6	
23	7	4528	181	4.00	5.81	
24	8	4458	182	4.08	5.81	
25	9	5014	184	3.67	6.20	
26	7	5191	195	3.76	10.87	
27	12	5403	196	3.63	11.13	
28	7	5673	200	3.53	11.40	
29	8	5333	211	3.96	13.07	
30	4	5215	213	4.08	13.07	
31	9	5820	218	3.75	15.80	
32	6	5953	221	3.71	16.06	
33	5	5822	227	3.90	18.00	
34	8	6606	254	3.84	22.96	
					$166.66	$101.87
					101.87	
					$64.79	
Av.		4233	163	3.85	$1.91	

Difference in profit between best and poorest cow, **$36.14.**

Herd No. 1 is composed largely of grade cows, of which but six had a predominance of dairy blood. Its most striking feature is that the entire herd of 34 cows brought in a profit of only $65, or an average of $1.91 per cow, whereas had the owner disposed of the 15 cows which lost him money, he would have made over $166, and would not only have been relieved of all the labor of raising the feed, housing, feeding, and milking 15 cows, but would also have increased his actual profits by over $101. To meet this loss it required more than the profit of the first 15 cows on the credit side of the account. In other words, he milked 30 cows for nothing and would have made more money

had he milked but his four best cows,—the only ones that come up to the standard a dairyman should have. The observance of such points as this rates the business ability of the dairyman and proves how essential it is that he should know just what each cow is doing, and dispose of all unprofitable members of the herd.

TABLE 3.—*Herd No. 2.*

No. cow	Age.	Lb. milk.	Lb. fat.	Percent fat.	Prof.t.	Loss.
1		1204	49	4.07		$27.52
2		1236	50	4.05		27.20
3		2944	88	2.99		15.17
4		2597	91	3.50		15.38
5		2518	98	3.85		13.18
6		2475	99	4.00		13.18
7		2569	105	4.09		10.98
8		3164	117	3.70		8.37
9		2829	123	4.34		5.67
10		3380	149	4.41		1.58
11		4582	158	3.45	$1.41	
12		4146	174	4.20	3.41	
13		4103	177	4.31	5.41	
14		4993	191	3.82	8.40	
15		4435	200	4.51	10.21	
					$28.84	$141.23
						28.84
						$112.39
Av.		3147	124	3.94		$7.49

Difference in profit between best and poorest cow, $37.73

This herd of 15 cows is phenomenal in the proportion of cows on the losing side of the account, and also in the excessive loss on many of them. Either one of the two poorest cows lost the owner almost as much money as was made by all the cows on the credit side of the account.

The inference might be that the cost of feed in Table 1 is too high for this herd, but the actual fact is that some of these cows were fed as much as ten pounds of grain per day, during the winter.

The most striking figure in the above table is the last one in the last column, showing a total loss of $112, which means that this man received $112 less for the products from his dairy herd than he would have received had he simply sold the feed. It is well, also, to note that the profit from the best cow is only

$10.21, and that this best cow is indeed absolutely inferior to the poorest cow in many of the herds in the state.

This is a deplorable state of affairs,—a man trying to support a family with a herd of cows utterly unable to return a profit. The actual conditions of this man's affairs is shown by the last two columns of the table, and is a forceful answer to the question, "Why test cows?" No man would conduct a losing business when fully aware of what he was doing.

Poor as this herd is, losing $112 annually, the owner, by disposing of the poorest two-thirds of his herd, without buying a single cow, might have prevented his loss of $141, and have changed himself from a cow keeper to a dairyman.

TABLE 4.—*Herd No. 3.*

No. cow	Age.	Lb. milk.	Lb. fat.	Per cent fat.	Profit.	Loss.
1		5986	252	4.20	**$22.66**	
2		7920	254	3.21	**23.84**	
3		7600	260	3.42	**25.75**	
4		7169	293	4.08	**32.20**	
5		8300	295	3.55	**35.00**	
6		9010	322	3.58	**39.87**	
7		9045	333	3.68	**42.07**	
8		9043	337	3.72	**44.27**	
9		8877	344	3.87	**44.27**	
10		9999	348	3.48	**53.53**	
11		11293	376	3.33	**63.99**	
12		7632	403	5.28	**56.69**	
13		10289	422	4.10	**69.70**	
					$553.84	
Av.		8628	326	3.77	**$42.60**	

Difference in profit between best and poorest cow, **$47.04**

Here is a herd of high average production. Altho a grade herd, its lowest cow returned a profit of over $22, which is more than twice that of the best cow in the poorest herd (No. 5). The difference between the individuals of the herd is large, but the star boarders were long ago eliminated, as a result of several years' work keeping individual production records of the cows and replenishing the herd by using a good pure-bred sire and raising the heifers from the best cows.

On only 96 acres of land, with practically no expense for purchased cows or feed, the owner is making with this herd a com-

fortable living for himself and family. He is an enthusiast instead of a plodder, reads dairy literature, turns drudgery to pleasure, and has time and money for the better things of life. He receives pay not only for his manual labor, but the neat little sum of $554 as a clear profit, to compensate for his head work.

Conclusions.

The returns from cows, when expressed in dollars and cents, stand out much more vividly than they do when expressed in pounds of milk and butterfat. Therefore, if every dairyman would keep a yearly record of the amount of milk and butter fat produced by his individual cows, and from this calculate, according to Table 1, the profit or loss of the individuals, he would be astonished at the wide variation in earning capacity of the different cows in his own herd, and the results would be of untold value to him. When the herds themselves are given like consideration, a notable contrast in the variation in earning capacity of the herds is brought out.

The cows in herd No. 2 lacked $7.49 each in paying for their feed and care, while each cow in herd No. 3 made a profit of $42.60, making a difference in income of over $50 per cow between the two herds. The best cow in the good herd brought in $69.70 profit, while the poorest cow in the poor herd was kept at a loss of $27.52, making a difference in the earning power of the two cows of nearly $100 annually.

Equally surprising facts for the guidance of the dairyman would be brought out were Table 1 applied to many other dairy herds.

THE IMPORTANCE AND PRODUCTION OF CLEAN MILK

Prof. Oscar Erf, Ohio College of Agriculture.

Gentlemen, I am going to talk on a very unpopular topic, but it is a thing that we must have in our conventions, it is a thing that we must preach; it is like the Sermon on the Mount, which has been preached for 2,000 years and I presume this

sanitary proposition has been preached that long and probably will be preached for the next 2,000 years. I really accepted this invitation with some reluctance, for fear that some of my friends in this state would be familiar with the Ohio conditions, and you would tell me something like the big girl told the boy, "Your face is dirty." She says, "You go home and wash your own face."

Now, I want to say that we are not in the foreground at all with sanitation, but we have accomplished some things. I refer to the breaking up of the distillery slop dairies. I know of one other place in the United States where this particular condition was carried on, and it went something like this:

There are a great many distilleries in Southern Ohio, it has not quite gone dry yet, you understand. In connection with these distilleries there were dairies, and to these dairies they run a string of pipes and the moment the kettle was emptied, it was forced over into a large tank, and then from this tank the cows were fed the distillery slop by gravity; all you had to do was to turn a faucet and you would feed your cows automatically.

The material that came from these tanks was a highly acid material, fermented, containing about 6 per cent solid matter, the balance of it being water; naturally, it had to be in order to flow through the pipes. This was all that these cows were fed; they never got a smitch of dry feed. The cows were produced from various parts of the country and were put into these stables, and they were fed on this slop and of course they became laxative, very laxative, in fact, a diarrhoea set in, and I can just give you an idea of the condition of that stable when I visited one of them. An old fellow came up to me, and he says "Hold on, where are you going?" I said, "I am going in the stable here to see these cows." "You better not," he says. "Come here, I want to tell you something." So he handed out a long coat and a pair of rubber boots. "Put these on first, before you go in there, or you will be sorry you didn't." And I can assure you, gentlemen, that was actually necessary, I am not exaggerating a bit. You can imagine the unsanitary condition that existed in those stables, and there was no use for shovels to remove the manure with, it was simply a mass of corruption. And yet in spite of all these things I must say that

the cows gave milk and a considerable quantity of it, but the milk was of an abnormal character, and I want to say to you that there is many a little grave in the cemeteries of Cincinnati caused by this unsanitary milk. Infants died by the score in that city owing to the abnormal conditions of the milk.

Nobody could compete with a situation of that kind. These distillers would send this food through the meters and would register the number of barrels that would flow into a trough, and five cents a barrel was paid for that feed, and that was all it cost the owners. Consequently, they could sell the milk for five cents a quart in Cincinnati and compete with the fellow that was doing an honest business.

I understand there was wealth back of this business and several attempts were made to remove the situation, but it seemed an impossibility. Bills were introduced several times into the legislature, but nothing came of them, they went into obscurity.

So, finally, we appealed to the sentiment of the people and we took them there; we also took members of the legislature and showed them the actual condition of affairs, and I want to tell you that these folks knew when they were coming, and they brushed up; they had their stables whitewashed, but for all that sentiment went against them and finally a bill was passed prohibiting the use of distillery slops.

We have no complaint to make against feeding distilled slops. Brewers grains are all right, we had no objection to them, nor to the distilled slop if they had fed some dry grain with it in order to get a mixture that would produce normal milk and keep the cow in good health; but they did not do that. So after this bill was passed, they were informed of the fact, and inspectors were sent down to these various places. Some of them were beginning to get ready to stop. Others continued, claiming it was wrong, the law was unconstitutional and couldn't be enforced. It was fought through the courts, and I must say it was a desperate fight, and finally about three months ago we closed the last distillery slop dairy in the state of Ohio, and we feel mighty good about it.

The question of sanitary milk is to the American people especially important. Milk is perhaps used to a greater extent in the manufacture of food products than in any other country and is fast becoming the food product that will be used more extensively than any other for direct consumption.

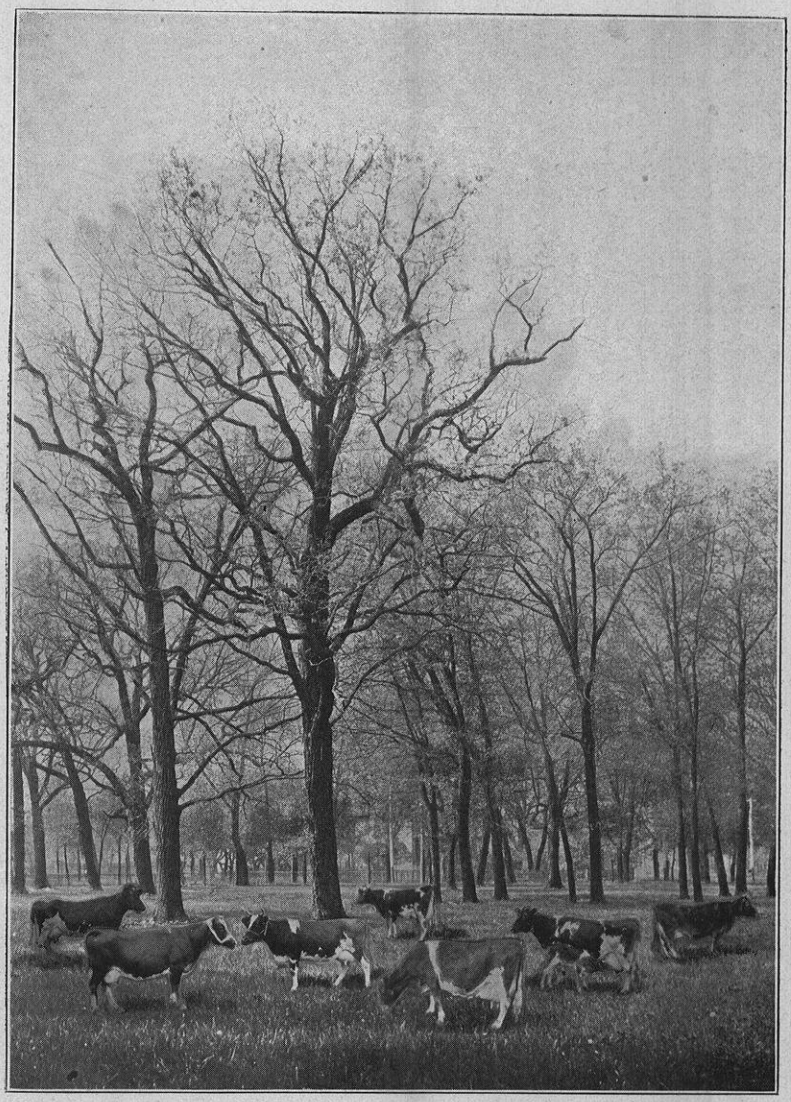
It holds a peculiar place in the nation's dietary because of its varied applicabilities, containing as it does all the essentials of a perfect food, protein, carbohydrates, fats, salts and water. It is capable of almost universal use because of its comparative ease of digestion and assimilation, and constitutes an important food product for the sick and convalescent.

Of even greater importance is the use of cow's milk as a substitute for mother's milk in infant feeding. We understand that four-fifths of the infants born in the United States depend entirely upon their foster mother, the cow, for their sustenance. It will be perceived that those most dependent upon this food, the sick, the convalescent, infants and children, suffer the greatest injustice from the use of foods impaired in their nutritive value. This is due to the fact that they are least able to resist the harmful effects of foods contaminated by toxins and disease producing micro-organisms.

While conditions of living have lessened the general mortality in civilized countries, this undoubtedly does not apply to the infant population under one year of age. It is recognized that intestinal diseases are the cause of the large infant mortality, conditions which are due in a great measure to improper methods of handling and feeding milk. These conditions are of grave importance to the people of this country, especially when we consider the fact that milk is one of the cheapest of food products, according to its nutritive value and digestibility, that man can purchase.

The average good cow is capable of producing about 6000 pounds of milk in one year and this milk at the very lowest estimate must contain 12 per cent of total solids. She is therefore capable of producing 720 pounds of dried solid matter, every ounce of which is readily digestible and can be consumed without any further preparation or without any necessary loss.

Compare this with her sister, the beef cow, which produces a calf a year, which at its best will weigh about 700 or 800 pounds at the end of that period. This, when dressed and prepared for the table, supplies approximately 100 pounds of edible material, which contains on an average 60 to 75 per cent of dried material and which requires expensive operations to prepare if fit to serve to man, and which after all these processes is not as good and digestible as the raw milk from a healthy cow.



LEADING GUERNSEYS

Honor Bright — Dolly Dimple — Stranford's Princess
Yeska Sunbeam Imp. Hayes Richesse 2nd — Glenwood Girl 6th — Mary McFarland

The highest producing cow in this group has a yearly record of 18,458.8 lbs. milk and 906.89 lbs fat; the lowest, 10,470 lbs. milk and 469 lbs. fat.

Since meat has been the important food stuff for man in the past and since through wasteful methods and extravagant conditions which man has created for himself that commodity has been raised in value, it becomes necessary for the people of the United States to resort to cheaper and more economical foods, of which we would class milk as first.

The question of the production of clean milk challenges our best endeavors. Gradually as our population increases conditions become more unsanitary, owing to the fact that the people concentrate themselves on smaller areas. Nature wisely provides for sanitary conditions as long as they are not disturbed by mankind. Fifty years ago approximately 40 acres of land were available for each cow. Unsanitary conditions were not liable to exist when the animal had an opportunity to roam over such large areas. Today, this amount of land should provide a sufficient amount of pasture to support 40 cows and oftentimes 40 animals are confined in much smaller areas, as for instance in barn lots of one-half to one-quarter of an acre. Continual tramping over the same ground converts the soil into slush in wet weather and raises dust in dry weather. Both conditions are unsanitary.

Years ago cows were not housed in dark, dismal stables but were kept out in the open air during the entire year, where they could get all the sunshine that Nature provided for them and all the pure air that existed under the heavens. True, inclement weather conditions at times worked hardships on the animals, but often vitalized them so as to make them strong and vigorous, and as a result of this the disease resisting power of the animal was much greater.

Tuberculosis undoubtedly must have been rare, first because the source of infection was reduced to the minimum, and second an abundant supply of God's sunlight and pure air made conditions very unfavorable for the growth of the tubercular germ.

All these things existed, and while the animals in their native state could not be considered economical producers, for they were not intended to be food producers for mankind, still Nature provided for them such healthful conditions that they were strong and powerful as a rule.

There is no question but that the most delightful and sanitary place to milk a cow is in the middle of a big clean, pasture

field on a quiet, beautiful, June morning, while the dew is on the grass. Nature provides these conditions but one cannot always depend upon them; consequently it is necessary for man to provide for inclement weather conditions. While he is doing this it is wise for him to copy from Nature as nearly as possible some of the most important principles in providing equipment and in housing his cows.

Since the production of clean milk is of such vital importance to infants and invalids and of no small concern to every consumer, it is necessary to take into consideration, a man with a clean conscience, then the health of the men engaged in the dairy business or those who handle the milk. More trouble can be traced to the health and purity of the man employed in the dairy and more little graves that now exist in the cemeteries can be traced to this one fact than to any other in the process of milk production. I should by all means place this before the health of the cow or any other manipulation in importance, as affecting directly the health of mankind. A man with no conscience is the most dangerous condition that exists in connection with the dairy business. I would prefer a man who is affected with a disease and who has a clean conscience, to a healthy man with no conscience, to handle the milk business. However, both are bad and should be eliminated from the milk producing business. Public health is at stake under both conditions. There is no question but that the man suffering from tuberculosis is more liable to infect the milk and transmit the disease to the consumer than a cow affected in the same way.

This fact the average Boards of Health has somewhat neglected in its systems of inspection. Sanitary conditions should exist on all dairy farms for it is very important that the conditions of the milker's household and his surroundings be sanitary as well as that he should be in good health. This necessarily requires a higher class of men to engage in dairy operations who of course demand a higher salary and this increases the cost of milk production, which the public must necessarily expect. It is my opinion that the Boards of Health could do more through this channel than by any other method.

Next in importance to the health of the milker is the health of the cow. Much has been said in regard to tuberculosis in dairy cows and while many rash and uncalled for statements

have been made by both professional men and dairymen, there still exists a sentiment of justice which cannot be overcome, though some attempt to exaggerate it, or even though the dairyman may try to keep himself in ignorance of the fact.

There is no question but that bovine tuberculosis has its effect upon human health, although it is limited largely to infants and invalids; let us as dairymen, try to do away with the least chance of infection from this source. Tuberculosis exists in cows and exercises its effects very strongly upon lessening the producing capacity of each individual affected. Knowing these facts why should we as dairymen be reluctant in testing our herds, if not for the sake of humanity but for the purpose of making our herds more efficient in performing their work.

The tuberculin test cannot be considered infallible, but errors in the test do not lie so much in the test itself as in the operations or in the veterinarians who do the testing. I am sorry to know that there are so many men who profess to be veterinarians who are incompetent to do this work. An incompetent veterinarian can do much harm in a community and the results of it will last for years. I shall welcome the day when there are more veterinarians who specialize along this line and the day when we will find more competent, worthy and honest men in this profession. I do not wish to say anything to discredit the profession for there are dairymen as well who are doing the things they should not do at present but which we hope will be rectified in the future.

If there is no veterinarian in your community in whom you have confidence, I assure you that it would be plausible, if you are an enlightened and energetic dairyman to make the test yourself, for we as dairymen should help to stamp out this dreaded disease which costs the lives of so many human beings as well as animals.

Great care should be taken that cows have no other diseases, the chief of which are the inflammatory diseases of the udder. All diseases depend more or less upon the housing of the animal; therefore, stables and surroundings should be provided that are clean and sanitary. The yards should be provided with the proper slope and drainage so as to make them dry and clean at all times. They should be either paved or well bedded to make them dry.

An enclosed expansive shed provided with light, where the cows can roam around during the day is not amiss and often results in great profit. This is especially true where you have old barns or old buildings which cannot be utilized for dairy stables. Clean milking stables are necessary for the production of clean milk.

It is evident that Nature intended milk simply for the nourishment of the young and the milk was never intended to see the light of day. If sucked from a normal, healthy gland, it is a perfect food for the offspring. In this natural method of nourishment, there is little possibility of contamination from outside sources. Since artificial methods of drawing milk have been resorted to, there enters a whole set of conditions which are entirely new and different. The milk comes in contact with the air, the vessel into which it is drawn and particles of dirt from many sources; therefore, it is essential to have pure air in the stable where the milk is drawn.

It is necessary that proper drainage should be provided in this milk stable and a hard, vitreous floor construction, except possibly in front where the cow stands, is necessary. The floor in the stables should be so constructed as to allow the smallest amount of contamination and at the same time be made simple and at a minimum cost.

Personally I believe that the cement floor is the cheapest and best floor to put in a dairy stable, but it is a little uncomfortable for the cows to stand on and I believe that the proper construction is to use cement in all places except where the cows stand, especially with their front feet. This place should be provided with a cork floor, as cork is the best insulator. Below the cement the floor should be thoroughly insulated with cinders and the ties should be comfortable for the cow.

A good ventilating system should be provided, which can always be built in connection with the silo and always works perfectly. Sunlight is of the utmost importance, therefore a barn should be provided with as much space as possible which can be devoted to windows. In some instances barns are built on side hills so that the light is available from only one side. If that is the case, I should advice the use of prism glass which concentrates the rays of light and sends them over the stable. Sunlight is a great disinfectant. It purifies the air and kills germ life of a disease producing nature.

With the proper barn construction, healthy milkers and healthy cows, the balance of the milk supply can be included in three terms: First, cleanliness; second, cold; and third, speedy transportation to the place of consumption. In the first place it is necessary to keep the germs out of the milk because the deterioration of milk is due to the germ life and if milk is drawn in the pure air and into clean vessels it is not possible for it to absorb any odors.

The second point indicates that what few germs there may be in the milk, which may come from the cow or through slightly faulty manipulations, would be prevented from growing by a low temperature. A speedy transportation from the place of production to the place of consumption is quite essential, for even at a low temperature germ life increases, although very slowly, so that in time milk may become contaminated even though kept at a low temperature. Therefore, if consumed soon after its production it will be found a great advantage toward a healthy milk supply.

The scoring of milk in the various cities by the Boards of Health is fast developing and today we have ample proof in making the statement that there is a test by which you can determine whether a man has been clean in his methods or whether his operations have been faulty in that respect. Since the Boards of Health have placed restrictions upon the temperature at which milk shall come into the cities, the bacterial test has finally resolved itself into a test of conditions under which milk has been produced.

In the thousands of bacterial tests that we have made for the various cities of Ohio, which have a temperature regulation of 60 degrees F., it is shown very conclusively that the bacterial content is comparable with the insoluble dirt in the milk, in other words, the sediment in the milk.

There are a few other factors which influence the number of bacteria. One of these is whether or not the cow is milked dry. There is probably no factor aside from sediment and temperature that has so great an influence as this. We find that the bacterial count increases 100 per cent when the cow is not milked thoroughly at each milking. It seems the milk that remains in the udder ferments very rapidly and increases the bacterial content in the next milking very decidedly. It is

this factor combined with the factor of uncleanliness that the average untrained milker will increase the bacterial count from five to eight times with the same apparatus and under the same conditions that a trained man will work.

The influence of wiping the udder with a damp cloth is another factor that has great effect in reducing the bacterial count. Frequent determinations prove that where the udder is wiped only about 1100 bacteria will drop into the pail, while under the same conditions with an unwiped udder we find the average bacterial count is increased to 10,000.

One should bear in mind continuously this important point, that milk should be handled as little as possible in pouring from one receptacle to another. Furthermore dust in the air should be eliminated as much as possible and strainer cloths ought to be avoided. If these things are taken into consideration and the temperature is kept low, there is no question but what a good, safe milk supply can be produced. And it must be expected by the consumer that an increased amount of labor must be paid for by the dairyman and that he must finally remunerate the dairyman for it.

The average consumer is not loath to tell the dairyman that he should produce clean milk and that as mere cleanliness should be the policy of every dairyman, he should not charge much for it. However, we have a great number of data to show what is meant by the cost of sanitation. We find that in the average certified dairy they are producing milk at a labor cost of about $49 per cow per year. We have all gradations and all degrees of sanitation down to where a man sits down under a cow sheltered by the leeward side of a barbed wire fence, who throws a few bundles of stalks out occasionally but allows the animal to get her chief nourishment from the straw stack, who is generally not public spirited and who is of a low type of character and consequently receives small remuneration. With these conditions at hand he can easily take care of the cow at a cost of $7 per year for labor.

We hope that the consuming public will soon recognize the importance of sanitation and we hope that the Boards of Health will be composed of public spirited, broad minded men there for the purpose of protecting the public health instead of catering to the whims of a politician. We hope that these Boards of

Health will employ competent inspectors who will not only be inspectors but will also be instructors. We hope that the veterinarians will soon become more conversant with the tuberculin test. Then and not until then will our milk supply be sanitary and safe.

The Chairman: It is now time for dinner, so we will take up this discussion immediately after dinner.

Recess to 1:30 p. m., same day.

The Convention met at 1:30 p. m., same day.

The President in the chair.

Mr. Aderhold: How about that cork board in the stall? Many of us did not understand that.

Prof. Erf: It is just a plain cork board, about two inches thick, or it may be cork brick, which is four inches thick.

Mr. Aderhold: Is cement underneath?

Prof. Erf: Yes. The cork runs back about three and a half feet from the manger. That practically takes in the whole cow, so that the cow, you know, does not rest upon the cement floor when she lies down. We find it very durable in our experience.

Mr. Goodrich: How much does it cost?

Prof. Erf: About ten cents a square foot.

Mr. Goodrich: Is that as hard as board?

Prof. Erf: No, it has considerable resiliency. That is one of the advantages of cork over boards, and at the same time it is sanitary.

A Member: Is that genuine cork, or is it manufactured material?

Prof. Erf: It is the refuse of a cork factory.

Mr. Aderhold: Is that pitched over after it is laid?

Prof. Erf: Yes, with common pitch, containing about 2 per cent light oil; that does not allow it to break off, makes it elastic-like.

THE WISCONSIN DAIRY COW COMPETITION

PROF. F. W. WOLL, Experiment Station, Madison, Wis.

We are all aware and proud of the fact that Wisconsin ranks among the foremost dairy states in the Union. The soil, climate, water and population combine to make ideal conditions for the pursuit of dairy husbandry in our state and as a result we find that she has taken front rank along most lines of dairy effort. We were the first to establish a separate dairy school and are now maintaining the largest and perhaps the best equipped school in this or any other country in the world. The Babcock test, one of the foundation stones in modern dairying was invented by our own Dr. Babcock, Chief of the Department of Agricultural Chemistry in our Agricultural College. So was the Wisconsin curd test, the method of cold-curing of American cheese, and a number of other methods and apparatus that are in general use in up-to-date butter and cheese factories. Wisconsin breeders of pure bred dairy animals have a reputation second to no class of breeders in the Union. Brown Bessie, Loretta D., Lily Ella, Yeksa Sunbeam and Colantha 4th's Johanna were all Wisconsin cows and made their wonderful records either in this state under the supervision of our Agricultural College or in national contests where they were entered by their Wisconsin owners. Who can estimate the value of the worth of any of these cows to our dairy breeders and to the dairy interests of our state! The bringing out of these cows has been the life work of their respective owners, the one important fact that will always give glory to their names and to the name of our fair state that renders it possible the achievement of these breeders. Wisconsin has also claim to distinction along the lines of dairy education aside from any reference to our dairy school or Agricultural College. The Dairymen's Association founded in 1872 has occupied an unique position in the teaching of specialized dairying and advanced dairy methods through the width and breadth of our state, and the work of this association, as well as that of farmers' institutes closely allied to it, has been of untold benefit to the farmers of our state through the de-

velopment of Wisconsin dairying, for which both institutions have stood first and last and all the time.

In this connection should also be mentioned the educational work of the Wisconsin Dairy and Food Commission in the line of factory inspection and that of the best special dairy paper in the world, Hoard's Dairyman, a Wisconsin product which has long since outgrown the confines of any state or country in its preachment of the dairy gospel and teaching of the principles of modern dairying. Our state has been exceptionally fortunate in having had the past thirty years or more, with Ex-Governor Hoard as the central figure, a band of enthusiatic dairymen who could speak of the advantages of dairying with the authority that comes from thorough, practical experience and technical knowledge and eloquence born by enthusiasm and a firm belief that the salvation of Wisconsin agriculture lies along the lines of animal or dairy husbandry. Without wishing to minimize the importance of the work of any individual it is only right to mention here the names of the early workers in the cause, Chester Hazen, Hiram Smith, C. R. Beach, Stephen Favill, W. H. Morrison, H. C. Adams, H. C. Thom, John Gould, C. P. Goodrich and Geo. C. Hill, most of whom have now gone to their reward. All honor to these men who gave themselves freely, often with sacrifice of their own convenience and private interests, to the educational dairy work that has been done in this state during the past few decades.

But no less important than the work of the leaders has been that of the rank and file of our dairy farmers and factory operators. No one can question this, when the development in our dairy industry during the past few records is considered, and Wisconsin's present position among the various states in the union. Within the borders of our state are now located nearly one-half of all the cheese factories in the union and one-sixth of all the creameries. The output of our two main dairy products, creamery butter and cheese, is worth about $27,000,000 and $21,000,000 each annually and if the value of condensed milk, skimmilk, whey and miscellaneous dairy products be included the sum swells to the enormous figure of $68,500,000, according to the latest information given out by the State Dairy and Food Commissioners. These are facts, the contemplation of which gives us the greatest satisfaction and makes us proud that

our lot has been cast here in a state whose name is everywhere recognized as synonymous with progressive dairying and enlightened citizenship.

I have so far sketched the bright side of the picture. The other side will not prove discouraging when we think of the progress that has been made and the present high development of our dairy industry in the best districts of the state. As your program puts it, there is, however, "abundant room for further improvement. The cow that does not pay her board is every where in evidence." We have in this state at the present time about a million and a quarter dairy cows two years old and over. No one knows just how much they produce on the average during the year, but according to the best information at hand we are doubtless safe in placing their average annual production somewhere around 4,000 pounds of milk and 150 pounds of butterfat. Valuing the latter at 25c. a pound gives us $37.50, or about what it is generally assumed costs to feed a dairy cow, if ordinary market prices are charged for the feed eaten. That is, there is only the value of the calf, the skimmilk and the manure produced to pay for the cost of the labor, which is variously estimated from $12 to $18 for a cow during the year, and for all expenses connected with keeping the cows, value of bulls and their feed, feed of heifers and calves, interest on investment, taxes, insurance, repairs, depreciation of property, veterinary services, etc. It is difficult to escape the conclusion that farmers keeping only average cows are supporting their cows and not the cows and their families.

The fact that averages are made up of lower as well as higher figures rendered the picture still darker. If we cannot find any profit in keeping cows producing average amounts of milk and butterfat only, what shall we say of all the cows and even herds whose production comes below the average. Where does the profit come in for their owners? If they had to buy the scant feed they give their cows. They would not be able to do business at the old stand for any length of time, but would go from bad to worse with every year. Fortunately the seed sown by our various educational agencies during the past decades has fallen on good ground in many places and is bearing fruit that will gradually raise the average production of our daily herd to a point where the industry will become what it already has in

our best dairy sections, one of the most profitable agricultural pursuits and one that will leave the farm in better condition for the generations that will follow us than it was when the present owners rescued it from the effects of ruinous agricultural practices of the past.

But where does the Wisconsin Dairy Cow Competition come in, you will ask. It will not be necessary for me to speak at length about the details of this competition for you will find it fully described in Circular No. 9 of our Experiment Station which will be sent free of charge to all parties sufficiently interested in the subject to write to the Experiment Station at Madison for a copy.

The Wisconsin Dairy Cow Competition came into being through our desire to aid in the further development of Wisconsin dairying by stimulating the interest in yearly testing of cows for milk and butterfat production. Work along this line has, as most of you know, been done by our station for nearly twenty years past; especially during the last ten years this work has assumed considerable importance and has become of great value to our breeders of dairy cattle. Last year the dairy press announced that Mr. W. W. Marsh of Waterloo, Iowa, had given $1,000 for prizes for the largest authenticated records of production of butterfat for one year by Iowa cows, and the thought occurred to me that it ought to be possible to find a few Wisconsin public-spirited men who combined would be willing to do as much for Wisconsin as did Mr. Marsh for Iowa. Professor Humphrey and I took up the matter with a number of breeders of dairy cattle and others in the state, and some progress was made during the past summer toward establishing a prize fund for a dairy cow competition, but not sufficient to make it seem worth the while to go ahead in view of what had been done in Iowa. The matter would, therefore, very likely have been allowed to go by default if Mr. Marsh had not stepped in and told us that he was interested in the development of the dairy industry in this great Mississippi Valley and would be glad to do as much for Wisconsin as he had done for Iowa.

The plan of establishing a dairy competition received a new impetus through this generous offer and the further arrangements gave relatively little trouble. A number of Wisconsin breeders of dairy animals and others subscribed a prize fund

that will amount to over $2,000 with accrued interest on the first of November next year. In addition, the W. D. Hoard Company offered a monthly prize of $25 (or $600 in all) to go to the cows having the highest production of butterfat for each month during the period the competition will be in progress, November 1, 1909, to the same date, 1911. A large number of special prizes of registered bull calves and of dairy machinery of different kinds have futhermore been secured, the aggregate value of which about equals that of the cash prizes, and finally the American Jersey Cattle Club and possibly other dairy breed associations will duplicate all cash prizes, except the Hoard's Dairyman monthly prize, when won by registered cows of their own respective breeds. It will be seen, therefore, that the value of all prizes which will be offered in this competition is likely to exceed $6,000. All of this sum will be paid to Wisconsin dairy farmers and breeders for records of production of butterfat made by their cows individually or collectively prior to November 1st next year. The College of Agriculture will pay for the administration of the tests and traveling expenses of our supervisors, out of the extension fund provided by the last legislature, and the farmers entering their cows in the competition will pay for the services rendered by our supervisors of dairy tests in conducting the monthly tests.

Prizes will be awarded for yearly records made by individual cows and for groups of two to ten cows in the same herd, the main emphasis being laid on the herd prizes for records of production by ten cows. $1200 in cash prizes and special prizes to the value of $1000 will be awarded for such herd record or for records made by groups of cows in the same herd. Among the cash prizes are four of $500, $300, $200 and $100 respectively, which should make it interesting to all owners of good cows in the state to enter these in the competition. Cash prizes of $300, $200, and four of $50 each are offered for the yearly records made by individual cows as explained in the circular just mentioned which gives a nearly complete list of the various prizes offered.

The competition is open to cows of any breed, whether of pure bred, grade or native stock. In fact, a number of prizes are offered for records made by cows composed of grade or native cows only, viz., four prizes: a feed cutter, a grinding mill, a

tread power, and a Babcock tester, for the highest records of groups of five cows in different herds, and three prizes of registered Guernsey, Jersey or Holstein bull calves will be awarded for the best individual records in as many such herds. These prizes cannot be competed for by farmers owning pure bred cows. For most other prizes offered, grade or native cows can compete with pure bred cows on equal terms and are welcome to capture as many prizes as they can.

The competition is conducted under the general rules governing the so-called semi-official tests which our station has been directing for many years past. Our supervisors visit once a month the farms where cows are entered and make a two-day test for the production of milk and butterfat by the cows, taking a preliminary milking in each case. The average per cent of fat for this two-day period is taken to represent the quality of the milk for the month and the production of milk is obtained from the owner's records, the figures being verified in a number of ways so as to insure their accuracy. The expense of the monthly tests on the competition is $5 per each herd, whether one or ten cows are tested, and the farmer must give our men board and accommodations during the conduct of the tests and bring them to and from the nearest railway station or place of testing. Besides supplying correct figures for the milk yields of the cows entered this is practically all that is required of them. The station or our representatives attend to everything else and furnish all necessary blanks except the original milk record sheets.

The competition was started November 1st, last year and has, therefore, now been running a little over three months. The results for the third month are not yet all in, but will be published in our dairy press within the next two or three weeks. For the month of November we had 60 entries, of which number 35 cows were entered for the entire month. The second month there were 85 entries, with 63 entries for the full month. The table shows the average results of the monthly tests to date in so far as the January figures are at hand. I shall not discuss these results at this time, but will only say a few words more with regard to the competition itself.

The Wisconsin Dairy Cow Competition

	November.	December.	January.
No. of cows entered	60	85	114
Guernsey	28	40	51
Holstein	16 (1 gr.)	25 (2 gr.)	36 (3 gr.)
Jersey	16 (7 gr.)	20 (7 gr.)	27 (8 gr.)
No. of breeders	13	18	26
Guernsey	7	8	12
Holstein	4	6	8
Jersey	2	4	6
Av. production for mo., lbs. butter fat	49.304 (35 cows)	51.349 (63 cows)	50.975 (97 cows)
No. above 50 lbs. butter fat	17	36	49
Production of butter fat for month:	Merna-letto II.	Leland Maid.	Daisy Queen Neth. II. Piebe.
Highest	80.772	79.297	85.238
Lowest	30.111	31.631	30.784
Average, 3 highest cows of butter fat for mo.	72.508	76.579	84.801
Average, 3 lowest cows of butter fat for mo.	33.004	34.017	31.395

The main object of the competition is, as previously stated, educational, viz., to attract the attention of dairy farmers and others to the importance of determining the production of the individual cows in their herds and in learning how far each cow gives fair returns for the feed she eats and the care given her. It follows, therefore, that we aim to interest farmers in all parts of the state in the competition so that they may take up this work and thereby be lead to improve their herds and feed and care for the cows that are worth keeping, in such a way that will produce according to their dairy capacity. We like to see as many cows entered in each herd as possible, since the value of the tests to the farmer will thereby be greatly increased. For this reason more prizes are offered for records made by groups of cows in the same herd than for individual records and the value of these prizes as we have seen greatly exceeds that of the individual prizes combined. The competition was not originally planned nor will it be conducted, so far as we are concerned, for the purpose of making big records or of deciding which of the dairy breeds will produce most butterfat in a month or a year. Of course, if the results of the competition show incidentally that we have some very excellent dairy cows in the state, as they have so far, all will feel gratified and it will make a good advertisement for the owner of the cows, and the breed,

and our dairy interests generally, but that was not and is not the primary object of the competition and will be of less importance to the dairy industry of our state than it will be to have dairy farmers in all parts of the state enter their cows and obtain accurate information as to the returns which their cows give them; whether these be high or low, the owners will be placed in position to know what their cows are doing and how their production may be increased so as to give fair returns for the labor they bestow on them. I trust that all dairy farmers here present will consider seriously the matter of entering their cows in the competition as these freshen in the spring or next fall, and will talk it over with their neighbors, so that we shall have a dozen herds entered before long where we now have one. A general participation in the dairy cow competition cannot help being of the greatest value to our dairy industry and will give a new impetus to dairy work in this state that will be far-reaching in its effects.

The rules governing the competition are given in the following, with a list of cash and special prizes to be awarded for records made by single cows or groups of cows in the same herd.

Rules Governing the Competition.

1. Any cow owned by a resident of the state of Wisconsin, may be entered in the competition.

2. Cows entered in the competition shall be tested for two days each month during the year, as arranged for by the rules governing the semi-official yearly tests in this state, with the provision that no award shall be given to a cow that has not been safely bred within five months from the date of last calving.

3. The owner shall furnish a detailed monthly statement of the kinds and the amounts of the different feeds eaten each month by the individual cows entered in the competition.

4. In order not to place young animals at a handicap in the award of prizes, the records of production actually made by cows under five years of age shall be increased in accordance with the average results obtained in authenticated yearly tests of cows of different ages, as follows: Records made by cows under 2½ years at the beginning of the yearly test shall be increased by 30 per

cent; 2½ to 3 years old by 24 per cent; 3 to 3 1-2 years old by 18 per cent; 3 1-2 to 4 years old by 15 per cent; 4 to 4 1-2 years old by 8 per cent, and 4 1-2 to 5 years old by 5 per cent.

5. Records of production for the competition may begin on the fifth day after calving and shall close 365 days from the date of the beginning of the test.

6. The cost of the monthly two-day tests conducted in connection with this competition shall be $5 for each farmer. The expense stated covers the entire cost of the test to farmers so far as the Station is concerned and includes all necessary expenses of the supervisors of the tests (traveling, hotel, per diem, etc.). Farmers supply the sulphuric acid and glass jars or bottles used on the tests, and pay notary fees (if affidavits are required) and express charges on Babcock testers. They provide for the accommodation of supervisors at the farm during the tests and convey them from and to the nearest railway station or next farm where tests are conducted.

No more than ten cows in any one herd shall be tested at one time on monthly tests if the cows are milked twice a day, and no more than eight cows where any are milked three or four times a day. The number of milkings per day shall in no case exceed four.

7. Applications for entries on the competition may be made any time before November 1, 1910. Records of production may commence on November 1, 1909, and prizes will be awarded for records made prior to November 1, 1911.

8. All questions not covered by the preceding rules or by the rules governing the semi-official tests in this state shall be decided by the heads of the departments of Animal Husbandry and Dairy Tests in the College of Agriculture of the University of Wisconsin, whose decision shall be final.

The following prizes will be awarded in the Competition:

I. Cash Prizes.

a. For the highest records of production of butter fat by a cow for one year—
First prize, $300.
Second prize, $200.
Third prize, $100.
Four prizes of $50 each.

b. **For the highest records of production of butter fat by 10 cows in any one herd for one year—**
First prize, $500.
Second prize, $300.
Third prize, $200.
Fourth prize, $100.

Two prizes of $50 each.

The maximum amount of money paid for prizes to any one breeder shall be $500. Prizes shall only be awarded to the bona fide owner of a cow at the time her record was made.

II. SPECIAL PRIZES.

1. **For the largest production of butter fat during a month by a single cow,** The *"Hoard's Dairyman* Monthly Prize" of $25 (will be awarded only once for records made by the same cow).

2. **For the highest records made by five cows in a herd composed of grade or native cows only:**
FIRST PRIZE, 1 No. 13 feed cutter, with traveling feed table and 12 feet of enclosed steel carrier, donated by S. Freeman & Sons Mfg. Co., Racine, Wis.
SECOND PRIZE, 1 No. 5 Ideal Duplex Feed Grinding Mill, donated by the Stover Mfg. Co., Freeport, Ill.
THIRD PRIZE, 1 Sheep Tread Power, donated by The Althouse-Wheeler Co., Waupun, Wis.
FOURTH PRIZE, 1-12 bottle Facile Babcock Hand Tester, donated by A. H. Barber Creamery Supply Co., Chicago, Ill.

3. **For the best individual record in a herd composed of grade Guernsey or native cows only,** 1 Registered Bull Calf, donated by J. Gilbert Hickcox, Milwaukee, Wis.

4. **For the best individual record in a herd composed of grade Jersey or native cows only,** 1 Registered Bull Calf, donated by Muskego Lakes Jersey Herd, Muskego Lakes, Wis.

5. **For the best individual record in a herd composed of grade Holstein or native cows only,** 1 Registered Bull Calf, donated by Frank B. Fargo, Lake Mills, Wis.

6. **For the highest records made by five cows in one herd, without regard to breeding.** Choice of 1 Registered Jersey Bull Calf, donated by F. H. Scribner & Son, Rosendale, Wis., or 1 Registered Holstein Bull Calf, donated by C. R. Montague, North Prairie, Wis., or 1 Registered Guernsey Bull Calf, donated by M. D. Cunningham, Kansasville, Wis. (Winners of 1st herd prize and special prizes Nos. 7, 8 and 9 barred from competition.)

7. a. **For the highest records of three pure-bred Jersey cows in a herd,** 1 Registered Bull Calf, the get of Merry Maiden's Third Son, 60516, donated by H. C. Taylor, Orfordville, Wis. (Winners of 1st herd prize and special prizes Nos. 6 and 8 barred from competition.)

b. **For the highest records of three pure-bred Holstein cows in a herd,** 1 Registered Bull Calf, donated by Rust Bros., West Allis, Wis. (Winners of 1st herd prize and special prizes Nos. 6 and 9 barred from competition.)

c. **For the highest records of three pure-bred Guernsey cows in a herd,** 1 Registered Bull Calf, donated by E. R. Whitcomb, Whitefish Bay, Wis. (Winners of 1st herd prize and special prize No. 6 barred from competition.)

8. **For the highest record made by a pure-bred Jersey cow,** 1 Registered Bull Calf, the get of Blue Belle's Eminent, 74774, or Double Time's Varsity King, 82315, donated by Fred Stubley, Black Earth, Wis. (Winners of 1st individual cash prize and of special prizes Nos. 6 and 7 barred from competition.)

9. **For the highest record made by a pure-bred Holstein cow,** 1 Registered Bull Calf, donated by A. L. Williams, Fond du Lac, Wis. (Winners of 1st individual cash prize and of special prizes Nos. 6 and 7 barred from competition.)

10. **For the largest number of records made by cows of the owner's own breeding,** 1 No. 12 Ohio Monarch Self-feed Cutter, complete with blower, elevator distributer, and 30 ft. galvanized pipe, donated by the Silver Mfg. Co., Salem, Ohio.

11. **For the largest number of records in one herd,** 1 Empire No. 2B hand separator, capacity 600 pounds, donated by Empire Cream Separator Co., Chicago, Ill.

12. **For the highest records of four animals the get of one sire,** 1 No. 15 United States Hand Separator, capacity 650 pounds, donated by Vermont Farm Machine Co., Bellows Falls, Vt.

13. **For the highest records made by two animals, the produce of one cow,** 1 Dairymaid Cream Harvester No. 3, capacity 650 pounds, donated by International Harvester Company of America (Inc.), Chicago, Ill.

14. **For the highest records made by three cows in the same herd, 2½ to 3½ years old at the beginning of the test,** 1 Improved No. 12 DeLaval Hand Separator, capacity 450 pounds, donated by DeLaval Separator Co., New York City.

15. **For the highest record of a heifer, 2½ years old at beginning of test, during her first lactation period.** 1 Agos Babcock Tester, donated by Vermont Farm Machine Co., Bellows Falls, Vt.

16. **For the highest record by a cow during her second lactation period,** 1-12 bottle 20th-Century Babcock Tester, donated by Creamery Package Mfg. Co., Chicago, Ill.

DISCUSSION

A Member: Is there any efforts to keep count of the feed consumed, the cost of production in this test?

Prof. Woll: Yes, we aim to keep the closest account of it that we can. There is no difficulty as a general rule in getting pretty close figures for the green feed eaten, but when it comes to hay, most of the farmers that have entered their cows will put down, "Hay, all they will eat." Or give just, "Hay, at lunchtime," or something like that. We follow it up and we want to get as close estimates as we can so that we can figure in all cases on the economy of the production of the cows. There is no account taken of it in the award of prizes.

PRODUCING MILK BY THE ACRE

J. P. MASON, Elgin, Ill.

Mr. President and Neighbor Farmers:—When I was invited to come to Wisconsin I felt a little overwhelmed. I had heard a good deal about dairy business in Wisconsin and about your noted breeders of dairy cattle. We sometimes hear you ship all the poor cows to Illinois, so you can readily see that if we make a living there you surely ought to get rich. That is what we have been trying to do in Illinois in the past. We have a state association for the improvement of dairy cattle, also a State Holstein Association, and we are fully determined to push the breeding of dairy cattle, as cattle of all kinds have never been higher or in greater demand, and the demand is in excess of the supply. At Elgin nearly all the farms are run as dairy farms and all the whole milk is sold, either shipped to Chicago, or to the bottling plants or a condensary. There is no butter made in that vicinity and about 80 per cent of the farms are rented, which is detrimental to farm life, and produces depreciation to farm property. If the owners would live on their own farms and improve them, it would be a great deal better; that would be

their place of business and they would get a great deal more out of the farms. I believe in having a farm on a good paying basis; it helps materially to build up a substantial, comfortable, pleasant farm home. It helps to keep the boy on the farm by showing him that the farm is just as comfortable and far more profitable than many other vocations, and the supply of opportunity for improvement, like the atmosphere, is always with us, and there certainly is no profession where brains or knowledge put into action, will count for more than in the business of farming or dairying.

I look at dairying as a business proposition, the farm and buildings being the fixed capital; the dairy and tools the working capital, and as in any other line of business enterprise, the object will be to make the working capital pay the largest per cent possible on the fixed capital, as well as adding to its value in the shape of soil fertility.

There are three factors that come into play in running a dairy. There is the soil, the cow and the man. The soil is just as sensitive to the touch, and will respond just as readily as a dairy cow will, with a balanced ration and good care. By working the soil when it is in condition to work and making a perfect seed bed by thorough cultivation many a crop has been doubled. On the other hand, I have seen many a piece worked when it would take the life right cut of it, and take five years to get it back to its orginal condition. Many farmers do not realize what that means. You can grow as many bushels of corn on a piece of land in five years by having the land in grass two of those five years. I like to have it in pasture, about half an acre to a cow, which will leave the land pretty well fertilized for the corn crop next year.

Now, I will go back and show how I commenced dairying. I did not have the opportunity to learn dairying that the young man has today. We did not have our agricultural school then, and we learned it through the hard road of experience. I often think that the young men of today ought to appreciate the opportunities they have for learning to do business.

I commenced on a rather poor farm with poor buildings; a good deal of timber on it and a good many sloughs that I had to tile, and let me tell you there is no investment on the farm

that pays better than tiling; you get the quickest results furnished by anything on the farm, if your land needs it.

I cleaned it up and went to raising crops. I did not know as much about dairy cows, as I do now. I used to raise all I could through the summer and in the fall I would go to Iowa and stock up my farm to feed the crops. I didn't buy as good cows as I could, but I fed the crop. In the spring I would reduce the herd, perhaps one-third, or one-half, and they would sell for more than they cost. In the fall and winter I would produce the milk when it was at the highest price and when labor was cheap, and we fertilized our fields and marketed our crops at a good advantage. I did that for years and I did well; I built other buildings on my farm and I bought more land. Finally I took a notion that I would try cattle feeding. I had 98 acres, and I never had much pasture. I used to soil my cows a good deal through the summer, at least partly soil them. You don't know how much feed you can get off a little piece of land if it is a good crop. Take the rye, for instance in the spring I used to feed that a good deal and it came right handy. Then I would go onto clover, or oats and peas. I always believed in feeding a cow. I guess we had a lot of poor cows; it made me feel I was at home when I looked at these figures here.

I know our friend Goodrich here. He gave me a raking up at one time down to Aurora; he called us "cattle killers." I have made the heaviest flow of milk per cow in July and August that I ever made feeding the cow in hot weather. That is what produces milk, when they don't have to run all over the farm to find something to eat.

One spring I pastured four and one-half acres of rye, and turned out 28 cows that had been milked all winter on the 26th day of April. They were there 26 days, and produced 292 cans of milk. I fed them a little hay, I always give my cows hay on grass; they won't eat much the first day, but they will the second, and there is nothing that keeps them from getting too laxative as well as a little hay and a little grain. That four and a half acres of rye paid me net $42.50 an acre in milk. But you have to be careful not to turn your cattle on when it is too wet. That happened to be a dry season. Then I put on twelve loads of fertility to the acre and put it into corn and I got a good

crop. Then I turned them onto seven and one-half acres of grass and that paid me $1.00 a day for ten days.

I have tried to raise good crops. I reduced my corn rows down to three feet, which made a difference of 50 per cent more hills to the acre and I couldn't see but what I got just as much to the row.

At that time we didn't know as much about clover as we do now; through the winter I would make this milk exclusively out of the corn crop with the addition of bran. We threshed the corn, dried it and mixed it pound for pound with bran, and corn stover was all the roughage they had. I kept track of the bran and the corn to see what an acre of corn would produce in milk, and I was never more surprised in my life. No experiment ever stimulated me any more than that month's work. My neighbor kept track of it also, and at the end of the month we were only $2.50 apart. My acre of corn in milk, after deducting the bran about $14 a ton at that time, and we were getting $1.00 a can for the milk, netted me $74.50 and he got $2.50 less. That stimulated me to go on until I had more land to keep more cows to make more milk to buy more land.

I then thought I would try the steer business. I had 106 steers. I want to show you the difference between dairying and cattle feeding and that is the reason I bring this in here. When I shipped those 106 steers and 300 hogs I brought back $10,300, but when I went to the barn it looked mightly lonesome; all the machinery, the raw material of the farm, went into product in the shape of beef and pork and it was gone. Then we went into the dairy business and that surprised me again. At the end of twelve months I found we had got within $50 for the milk of what those cattle and hogs brought, and when I went to the barn the next morning we were doing business right there, producing 50 cans of milk per day. It struck me as the one being the product of the working capital and the other took the working capital to get it, so there's a point for the dairyman.

We want to get more out of an acre of land, as well as more out of the cow. We have been turning attention to raising young stock, and when I was running that way my milk brought me $1650, and if we made the same amount of milk without any increase in the cost of production, at the price we get now, it would bring over $2,000 a month. I have good barns, with

cement floors. I feed my cows heavy and take the best care of them.

I do not think any of us have any conception of the possibilities of the American dairyman. It is like compound interest, it will double up on itself if you will only carry it on right. You are building up your soil on the one hand, increasing the crops yearly, and on the other hand you increase the flow of milk. We want to encourage this, show our young neighbors what there is to it and have our young men realize that there is something in farming. It is a serious matter that so many are leaving the farm, going to the city, but none of them quit eating when they go there. All the time, we must remember, that there is no farm in the country that has ever been run quite as it should be. I never talked with a man but that admitted he could do double what he is doing. That is the trouble with the high living we hear so much about, we are not producing what we should. There is nothing worse than a farm that isn't run right, not very well situated, with poor buildings, and not very good crops raised, but when you have your farm up in good shape, your buildings handy, everything convenient and have a herd of dairy cows well bred and everything run right and a good substantial milk check at the end of the month, there is nothing more attractive.

I have a statement of a farmer given me the other day, and I want to read it so you can comment on it. It is just about my line of farming. He has done well, and I want to say here he can double the net profit and that is what we are after. He says:

"The feed on hand January 1, 1910, is practically the same as that on January 1, 1909, also I had 59 milking cows on hand January 1, 1909, and have the same number January 1, 1910. I have 131 1-2 acres in my own farm and rent 80 acres, making a total of 211 1-2 acres. Had 60 acres into corn, 30 of which was put in silo; the other 30 was shocked and husked. Had 40 acres of hay, consisting of 20 acres alsike clover and 20 acres common red clover and timothy; four acres of rye, which was cut and put in silo with three acres of alsike clover, about the middle of June, which I began feeding July 1st, and same lasted until the middle of September, when we commenced filling silos with corn.

"I have two silos, one 16 by 30, the other 16 by 36, both Stave Indiana Silo Company silos. I have a Belle City feed cutter

and blower, run with an 18-horse power gasoline engine, therefore do not have to be under obligation to others, but can fill silo when and how I like. I think those seven acres of rye and clover were the most profitable crops I raised, as it stood me in good stead, as you will see by the number of pounds of milk I got through the dry time and fly time of the summer of 1909 which all the dairymen of Northern Illinois and Southern Wisconsin will well remember. I had 15 acres of oats and the balance of land was in pasture. The number of pounds of milk produced per month that was shipped to the St. Charles Condensing factory at St. Charles, Ill., is as follows:

"January, 37,846 pounds; February, 34,856 pounds; March, 37,571 pounds; April, 32,776 pounds; May, 34,000 pounds; June, 35,632 pounds; July, 30,982 pounds; August, 32,141 pounds; September, 32,717 pounds; October, 39,496 pounds; November, 36,516 pounds; December, 42,617 pounds; Total, 426,150 pounds.

"I also raised fifteen calves, which I fed 18,360 pounds of milk, sold to private parties 3876 pounds, making a total of 448,386 pounds for the year, or 7600 pounds per cow. The average price of milk being $1.40 per 100, would make each cow's milk bring $106.40, and being 59 cows in the herd, the grand total would be $6,277.40. Besides the fifteen calves I raised, I sold $200 worth of veal calves. I have 12 two-year old heifers, which have advanced in price the last year $20 per head, or $240. Have 12 yearling heifers, which have advanced in price $10 per head, or $120. Total amount derived from dairy from January 1, 1909, to January 1, 1910, $6,837.40.

"Now, taking the debit side of the sheet, we have 80 acres of land rented at $5.00 per acre, or $400; feed and mill stuff bought $825; hired help, five months, $725; hired help seven months, $1,085; blacksmithing bill, $40; repairs, $50; threshing, $25; binding twine, $25; gasoline, $25; taxes, $50; depreciation on 15 cows, $450; two cows died, $160; interest on money invested, farm included, $20,000, at 5 per cent interest, $1,000. Total, $4,860. This would leave a net profit of $1,977.40. As you know, Mr. Mason, I am not on my farm, and only go up there occasionally, and depend entirely on hired help. I think the possibilities of farming and dairying are in their infancy. Farming is the grandest occupation, and with our experimental colleges and machinery of the present day, one can scarce-

ly conceive the advancement that will be made in dairying in the next few years. I am quite sure that I had a number of cows that gave over 10,000 pounds of milk the last year, as 12 of the cows in this dairy were two-year-old heifers, with their first calf. I wish to say that I have an exclusive Holstein dairy, six of them being pure breds. The remainder are very high grade, as I have kept a pure bred sire for the past twelve years.

"Hoping that this may be of some value to the young farmer if not to the old, I remain, your friend and fellow dairyman, F. B. Pratt."

The man that wrote this letter was foreman on the Dunham Stock Farm, and he rented a farm two miles away. There are two or three little items I think you can get around and double the profits. In the first place, in figuring what these young cattle had advanced, it cost $44.40 to keep a cow a year, and the help cost $30; so with feed, everything figured in, the milk cost $1.00 a hundred. I think he fed a little too much; if he had had alfalfa he could have cut out the pasture hay, so in all those items he could have largely increased the profits of his farm.

There was another farmer from whom I got the weight of milk from the Borden book, and the average of the entire herd for the year, was 9,250 pounds. We have several farms in our neighborhood that are running along those lines.

I saw a piece in the paper the other day that shows the difference in methods; it was about a 160-acre farm in the great dairy district and the farmer concluded that the farm didn't pay, but he had the same opportunity that this other man had. Such reports as his are no encouragement to our young men to keep on farming, but there is really no better business, and we want to encourage it all we can, and where it doesn't pay, there is something wrong with the system. It is simply a business proposition. Of course you ought to keep books like any other business man, and then you can see where you can better yourself next year; you have got something to work to and know what you are doing, and that is what the average farmer doesn't know.

The institute has influenced hundreds of young men to attend the College of Agriculture, and the short courses, and the study clubs formed throughout the state are the direct result of the efforts of the institute. Its department of household science

is an important feature of the work and its influence is felt in every county in the state.

Listen to State Superintendent of Public Instruction, Francis G. Blair. He says: "The Illinois Farmers' Institute is covering a field in public instruction that is not and cannot be occupied by any other educational institutions; it is doing more for the educational uplift of Illinois than any other factor.

DISCUSSION

Mr. Jacobs: What did you get a can for your milk?

Mr. Mason: Last winter the price was $1.40 and 16 cents freight; that left $1.24.

Mr. Jacobs: What sized cans?

Mr. Mason: Eight gallon cans. Last summer I think it was 91 cents net, an average of $1.06 or $1.07 for the year, and we fed silage every day, night and morning.

A Member: Do you raise your heifers or buy them?

Mr. Mason: I have not raised them for the last two years.

Mr. Imrie: Do you supply the water to the cow or the can?

Mr. Mason: I run it through the cow first.

A Member: How do you feed the salt?

Mr. Mason: I put it in the manger. You don't want to crowd it onto them. If they don't relish it, don't give it to them.

A Member: Do most of them want some every day?

Mr. Mason: Yes, they get kind of used to it. I like to feed them pretty heavy with salt. They drink more and the more they drink and the more they eat, the more milk they will give, and the more milk they give the more they will eat and drink.

A Member: How do you water your cows in the winter?

Mr. Mason: We have iron boxes between each two cows so they can drink any time they choose. I had 100 cows in one barn, and I never came home, never stepped into that barn even in the dead of night, that I didn't hear some cow drinking.

Mr. Everett: Do you have any tuberculosis in your herd?

Mr. Mason: I reckon so. That is where I made a mistake. I started in and went to raising cattle and this has come up now and I am going to test my cattle and get down and start over again.

The Chairman: This has been a good discussion. That is a man after my own heart.

Mr. Aderhold: Only you don't admit your mistakes so freely.

Mr. Mason: They say you can't teach an old man, but I have been a farmer all my life and I never was so anxious to learn as I am now.

Prof. Emery: It seems to me that we must all be impressed as we have looked upon Mr. Mason and heard him speak, that the first and foremost thing is this iron purpose in that man to achieve his results. That is the first essential. When we have a man with that purpose, that determination, the cow will come and the opportunity will come.

The Chairman: I think Mr. Mason struck one of the keynotes of successful dairying, and that is to keep that machine going. You go into any manufacturing plant and we find every machine working to its capacity, and that business would not prosper unless those machines were going to their fullest capacity.

A Member: I put some alfalfa into my silo last June and my cows wouldn't eat it until starvation stared them in the face.

The Chairman: Those were Guernsey cows.

A Member: No. I can prove by Mr. Searles that they were Jerseys.

FEEDING DAIRY COWS FOR LARGE PRODUCTION

Mrs. E. W. Strawbridge, Moorestown, N. J.

I feel it quite an honor to be asked to address you on some of our experiences at Pinehurst in making A. R. records, and I had hoped to speak to you in person, and have the pleasure of mingling with you once more, but I have been called 1000 miles away by a death, and shall not return in time for this meeting. May I hope at some future time to be invited to be with you? I have a great regard for Wisconsin dairymen, both for their progressive spirit, and the success which has crowned their efforts.

I was asked to speak about "Feeding cows for large records," and while it may not seem entirely relevant, I want to begin

with raising the calf. I feel so many good calves are lost, and many more perhaps injured, because their owners don't realize the necessity for keeping down the ever present "germ." We have for many years raised calves with a very good degree of success in the same pens and on an earth floor. We aimed to clean out these stalls about once a week, and to disinfect the floor with formalin or air-slaked lime. I had been talking of putting in cement floors, but had neglected doing so, and this last spring our Nemesis overtook us, the calves were sick, first one and then another, and then nearly all sick, then better, almost none of them doing well. They did not look like our nice, thrifty calves. At last two fine heifers went the way of all flesh. (They would have paid for the cement floor over and over.) I got a good sensible veterinarian to come and look at the calves. He observed the little wretches, heard them cough, and promptly pronounced it "verminous bronchitis," or worms in their throats, from over-crowding and being too long in one place. Also he said the very dry, dusty spring helped to make it worse. Being a sensible man he gave no medicine, but told me to put them in fresh pasture, to feed them grain in new loose boxes, and as the rain had come to lay the dust, he thought all would come out well. We put them in a meadow with running water, and he was right, for now we have a bunch of calves that would do any dairyman's heart good to see. But we have put in the cement floors, laid to drain out back, and now with cleaning the stalls each week, and disinfecting them, I don't expect these serious diarrhoeal troubles. I mention this because I know many farmers have periodic attacks of scours among their calves, losing them in quantities, then perhaps for years losing almost none, and then the germs arise again in their might from the old foul soil, and decimate the flock. Given clean stables, warm sweet separator milk, sweet grain and good hay, a calf ought to be a thing of beauty, and it should be a joy to watch it grow.

We have made at Pinehurst more than forty A. R. Records, averaging about 465 pounds of butterfat from the two-year-old heifer up to the mature cow. In these days hearing of the feats of "Dolly Dimple", this may seem quite a modest achievement, but it is my proud boast that these records have been made by plain farm men, nearly all under plain farm conditions, and with no other superintendent than myself. That we have the cows in

the herd to equal some of the biggest records if they were pushed and cared for as these cows have been, I have reason to believe. This, however, I never expect to do. It is my feeling that I am doing the dairymen of this United States more real good by making good records with such care as a farmer ought to give, and which he can duplicate, and by selling the bull calves at such prices as he can afford to pay, than I would by pushing my cows for phenomenal records, and asking almost prohibitive prices for their offspring.

We, in our part of New Jersey, have many difficulties to contend with, that the western farmer knows nothing about. In the first place our soil is comparatively light. It is also in need of much fertilization, and not much of it is natural grass land. A cousin of mine in Pennsylvania told me if they let their orchards alone, they would come in in blue grass, but my orchard left to itself would grow up in weeds of as many varieties as Jacob's coat had colors. Consequently we have to fight for all we get in records from our dairy cows. For us there is no easy road, and I know my cows are capable of far more than they have ever done, given the best condition. Now to begin with a cow who is to make the record, I like to have dry at least six weeks before the commencement of the record. I am sorry to say we do not always accomplish this feat. Selma of Pinehurst, 14521, who has three A. R. records, the last one of 644 pounds of butterfat, does not usually like to cease giving milk, and a diet of water and timothy hay has been resorted to, to induce her to cease her lacteal functions. This I do not like to do, as for best results, I want a cow fat, almost like beef, and then when she freshens, one can almost see the fat fall off into the pail. Auricula Second, 12-2-09, a cow whose average fat test is not high, about 4.57, has under these conditions tested 5 per cent, her first month in lactation, when ordinarily she would test about 4.2 at that time. I do not think we can feed fat into milk by any change in grain rations, but we can put it in for a time at least, out of the cow's own body. I am now speaking of the best way to make records, as I have found it, but we don't near always get our cows in this fine condition.

We will now suppose we have our cow fresh, in good condition, and ready to begin her year's record. I have found good, sweet bran, ground in the home mill, and Buffalo gluten mixed in the

proportion of about two of the former to one of the latter, to be a very good foundation. We have fed bran and gluten in varying proportions to make almost all our records. This winter we are feeding about 75 pounds crushed oats, 100 pounds gluten, 200 pounds bran, and a little cottonseed as our grain ration. After freshening we think a warm bran mash a suitable meal to begin with, and when the udder is much caked, ensilage has to be fed very sparingly for some time. We begin with a small amount of grain, hay, and add some ensilage as the cow seems able to bear it. Gradually increasing the grain, watching the cow's appetite, in three weeks she should normally be on full feed, which seldom means with us, as much as 10 pounds per day. Oftener it is eight pounds, and Betty K made 509 pounds of butterfat in a year, often eating only four pounds per day, and always in good flesh. We have alfalfa mixed clover hay and ensilage for roughage. We usually raised the large beets to give the test cows a lunch at noon, but this winter we are trying beet pulp for this purpose, moistened and allowed to swell, and a small portion of grain added. This we find very satisfactory, both to the cows and ourselves. As the spring comes on and April opens, the birds begin to sing, the grass to start, and the cows grow restless, I have seen them looking longingly through the gates toward the open fields, lowing, and showing plainly the desire for a change from the winter diet. We can't allow our small area of precious pasture land to be invaded before May 10th, and unless green feed is furnished now there is a big shrinkage in milk. To meet this need, we have fields of rye, sown the fall previous, and about mid-April, the cows are wading in green rye up to their knees, eating their fill. The increase in milk is most gratifying, as well as in beautiful golden color. I love this farm picture best of all, the beautiful sleek, contented cows from the warm stables, no flies to torment them, apple blossoms overhead, and the glorious spring days full of the promise of new life. When the rye is gone, we have some pasture, but our acreage is small, and our droughts of late years have been severe. Soon we are soiling with our faithful friend, alfalfa, to be followed by Canada peas and oats, then cowpeas, alfalfa again, fodder corn, and even sowing last millet and rye for fall pasture. Cabbage serves both for market and feed. The damaged heads and leaves fed after milking are a very valuable fall

asset. We are so heterodox as to pasture our alfalfa fields a little before winter comes on (though never on empty stomachs) and then in October we begin on our main-stay, ensilage, again. We try not to let the cows feel the transition from one season to another more than can be helped. You see there is both work and expense in this way of feeding, that those who have plenty of natural grass land, know nothing about. I greatly prefer blue grass and clover to almost anything else as milk makers, if one can only get enough of them. Our drought last year was very severe, almost no good rain from May until October, and our pasture fields were indeed brown and dry. My foreman managed so well in his soiling crops that the cows came into winter in fine shape, while many dairies were almost starved. Our records were quite creditable too, though of course, not near what they should have been in a favorable year. To sum up I would say, if we want our cows to do good work, first, have a cow in fine flesh and good condition; second, give her a good rest from producing milk, third, when fresh bring her gradually to full feed, taking near three weeks to do it; fourth, feed an ample easily digested grain ration; fifth, always have an abundance of succulent palatable food, both winter and summer, so that the cow will have not only enough to maintain herself, but plenty over to put into the pail, and with water always within reach; sixth, make her happy and comfortable, treat her kindly, and always milk her clean.

As I have said in another paper, take your men into partnership with you (unless you do all the work), get them interested, speak not of "my cows" but of "our cows", and thus secure their interested co-operation, which for me at least, is absolutely essential. There is drudgery in all lines of work. It takes "grit" to carry anything worth while to success, but let us by kindness, sympathy, profit-sharing and enforcing the Golden Rule, secure the loyal, happy co-operation of those who toil with us. If we can unlock some of nature's secrets and put them into successful operation, and at the same time make life more worth living, and up-lift those who work with us, we shall feel at the close of life's journey, that our efforts have not all been in vain.

BREEDING THE DAIRY COW.

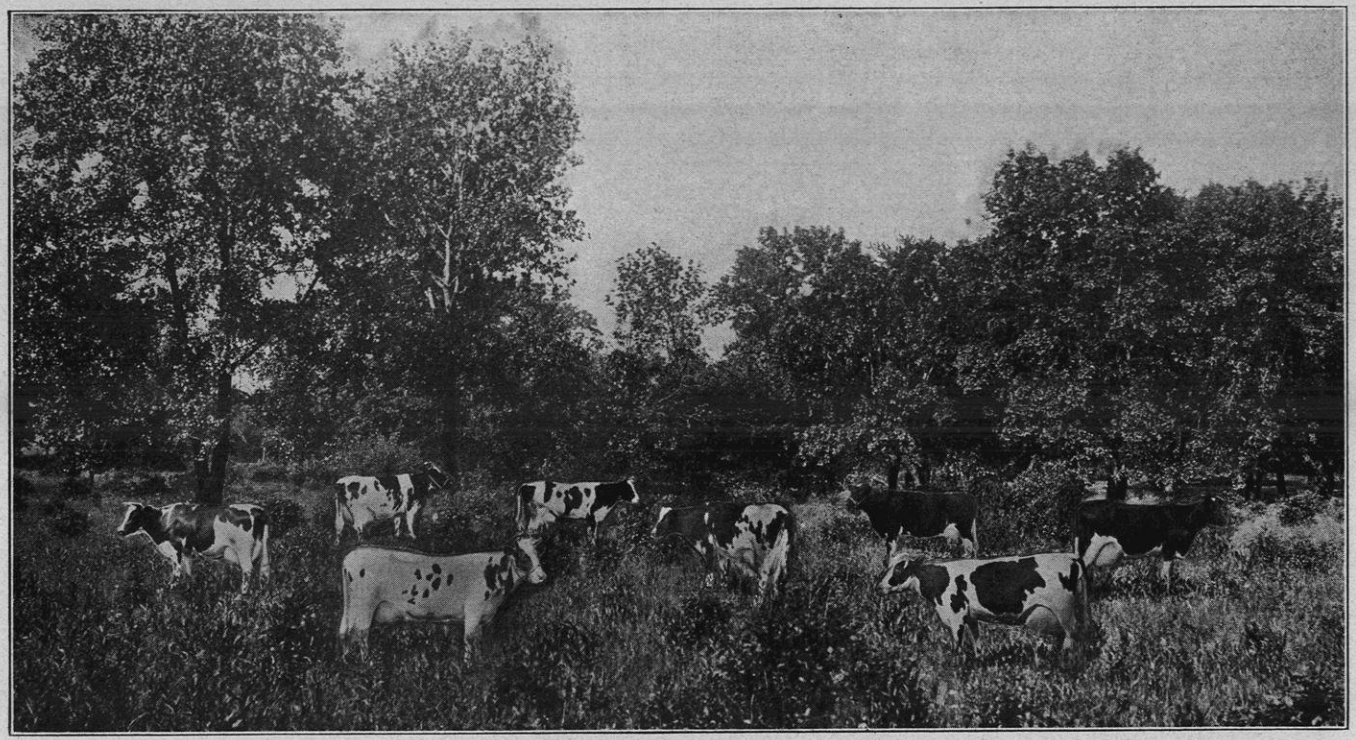
JOHN CLARK, Whitewater, Wis.

There are three essentials that we must bear in mind when we seek to breed dairy cattle of the highest class. They are: 1st, the qualities that make a desirable animal; 2nd, profitable production; 3rd, reproductive ability. I shall consider these in the order named.

The qualities that make a desirable animal, are usually expressed by the word Constitution. Webster defines constitution as, "That form of being or peculiar struction and connection of parts that makes or characterizes a system or body." If breeders meant this definition when they use this term constitution it would answer admirably. But as used by breeders, constitution indicates strength and the ability of an animal to maintain its general health and vigor and its productive and reproductive powers unimpaired to a good old age. The score card points allotted to constitution are merely those indicative of physical health and strength.

Thus it would seem that the qualities that make a desirable animal is a term that expresses my meaning more clearly.

I shall not attempt to describe the typical form of the dairy cow, but the man seeking to become a breeder must always study the animals about him and fix in his mind the essential points so that he will be able to analyze an animal at a glance. Until he has a definite and desirable type in his mind and selects his cattle to conform to it, he will not produce uniformly good cattle. It is far easier to get good prices for well formed, attractive cattle, and form is the only visible indication of performance. Wherever you find a man selecting, breeding and caring for his cows intelligently, you will find a herd returning a large profit. And when you find a man that is indifferent regarding these things, you will find a herd that returns at the best a very small profit. The great secret is in the individual cows of the herd; in every herd there is an enormous variation in the production and profit of the different cows. There is only one way to secure the highest profit from your herd and that is to know



BANNER HOLSTEIN-FRIESIANS

Inka 6th — Roxanna Parthenea — Grace Fayne 2nd's Homestead — Skylark Mercedes De Kol Johanna — Shadybrook Gerben
Esther Piebe De Kol 2nd — Aaggie Cornucopia Pauline — Colantha 4th's Johanna

The highest producing cow in this group has a yearly record of 27,432.5 lbs. milk and 998.26 lbs. fat; lowest, 16,063.3 lbs. milk and 526.9 lbs. fat

what each cow is doing and to keep the best. The cow testing associations under the control of this society furnish the best way of doing this work. The breeders of pure bred dairy cattle in this state are missing great opportunities by not doing everything possible to organize such associations in their own neighborhoods.

If you desire to build up a permanent herd to receive enduring benefit from your work of testing and selecting you must seek for reproductive ability. Hitherto I have said nothing about the relative merits of scrub, grade and pure bred animals. While the scrub cow may have productive ability and be a fairly desirable individual, there is little chance that she has within herself the power of producing offspring with her good qualities unless she is mated with a bull capable of transmitting those same qualities. Mated with a bull of her own class her own merits will be great indeed if she can impress them upon her offspring. Among grade cows of the established dairy breeds desirable individuals and profitable producers are the rule rather than the exception, and when mated with purely bred bulls of their respective breeds these qualities are usually reproduced. Mated with grade bulls like themselves the tendency of hybrid matings to revert will produce a mixed offspring, some good and some bad. In pure bred herds we expect to find the desirable qualities and productive ability reproduced with certainty. You may conclude from what I have said regarding the comparative reproductive abilities of scrub, grade and pure bred that the pure bred is always a desirable animal. I do lay great stress upon pure blood because it is the source from which we must draw the blood for all breed improvement. But a pure bred animal should be pure, not only in the sense of being eligible to registry, but pure bred because it is free from the blood of unproductive ancestors. In testing a pure bred herd we will usually find about as wide a variation in production as in any other herd, but in good herds it varies around a far higher average. We will also sometimes find that the daughters and granddaughters of some certain animal group themselves together and whole families will be found whose production is uniform and far above the rest of the herd.

When a breeder finds a family of this sort he should devote his energies to developing it, for he has a firm foundation upon

which to build, for such families are the real source of all improvement in breeding. The great cow that springs from an ordinary ancestry and whose descendants fail to inherit her greatness is a damage to any breed, because breeders will pay high prices for her sons only to learn after costly trial that she did not possess reproductive ability.

What I particularly wish to impress upon you is that first you must have a clear conception of the best types of breed. Then, that you must test them to learn their productive ability. Finally that you should always seek in your own herd for high producing cows of superior type whose daughters are uniformly superior in type and performance. Not all of us can expect to discover strains equal to the Glenwood Girl, Bonnie Lassie and Yeksa families, but careful testing will bring out many more just as good, and every breeder will find plenty of strains worth developing if he will only look for them.

There is no lack of good material to work on but there is a lack of the patience and perseverance necessary that it takes to wait for a family to develop. Many writers in the agricultural press are fond of referring in a mysterious way to the secrets of the great breeders, how they mould the animal form to their will, etc., etc. These writers rarely make a sensible attempt to go behind the veil that guards this holy of holies and they create an impression that the successful breeder has in some way obtained an uncanny knowledge that is beyond the ken of ordinary mortals. Some of the old time breeders encouraged this belief and it has grown until it is surprising how many sensible people believe it. As a matter of fact, I do not believe that any breeder that ever lived had any mysterious secrets about breeding that were worth knowing or ever succeeded in any other manner than by knowing just the sort of animals that he wished to produce and by breeding to the strains that would produce them. Do not think that I wish to belittle the great breeders of an early day or that I undervalue the work that they performed. There is no question but some of these men attained a really marvelous knowledge of animal form and that they established strains whose reproductive ability was wonderful. We have little record of their work, but the thing that has impressed most people is that practically all of them practiced inbreeding. From this the belief has grown that it was the greatest factor in their work,

We must remember that they had but a limited amount of material from which to choose breeding animals. They knew the value of reproductive ability and that a strong outcross of unsuitable blood would shatter the results of their labors. Thus in order to retain this reproductive ability they mated close relatives together. Chas. Darwin probably studied inbreeding more closely than any other man. He decided that while cattle were not particularly susceptible to the evil effects of inbreeding, still when close and long continued that it resulted in a loss of vigor and fertility.

It is probably a good plan for a breeder of experience to experiment carefully with inbreeding; whether it is advisable in any case or not can only be determined by trial. In all the dairy breeds there are many families combining all the three essentials in a high degree of perfection. We should look to these families for our bulls and labor to produce the right sort of females from our own herds to mate with them.

DISCUSSION.

Prof. Emery: Mr. President, I have been most strongly impressed with the exceedingly clear, able and forcible way in which this subject has been presented. I think we should count it as great, good fortune to listen to so clearcut and able a paper as has been presented to us.

Mr. Everett: What stress do you place upon function and form in breeding dairy cattle, Mr. Clark?

Mr. Clark: I think that there is a very close relation between them, but we cannot always say that they are developed equally in the same animal. A cow may be lacking in form and still greatly developed in function, or she may have an extremely good form where the function is not so well developed; but then they are certainly combined and there must be some connection between them. I think we ought to try to get them both.

Mr. Everett: What value do you place upon dairy form? To be more explicit, what is dairy form?

Mr. Clark: Why, the shape of a cow, a shape that is common to all the dairy breed and to all well producing cows, whether dairy, dual-purpose or native.

Mr. Everett: Will it pay to feed cows having the dairy form for beef?

Mr. Clark: I do not consider that it will. No.

The Chairman: Don't you think, Mr. Clark, that one of the places where we have fallen down as bad as any other is in letting a good many of our sires go before we really knew their worth?

Mr. Clark: Yes, I do think so. I do not believe there is any better way to produce cattle than by breeding to cattle that we know.

Mr. Glover: In breeding cattle, how much do you take record into consideration?

Mr. Clark: Of course it depends on what you are taking it for. For testing purposes, I wouldn't take a big record. In producing good cattle, I would sooner breed to a family that had a lot of good cows in it than one that had only one with a big record.

The Chairman: Then, according to your statement, the longer line of good producing ancestry you have in the pedigree of that animal, the better you like it?

Mr. Clark: I do, certainly.

Prof. Erf: How many generations would you inbreed and sider it safe?

Mr. Clark: I would only regard inbreeding as a thing to experiment with, and a man should be governed by the results. We have allowed a good deal of inbreeding in our own herd, but I can say we never have produced satisfactory animals. Those inbred animals proved very good dams.

Prof. Erf: You practice line-breeding then, very largely?

Mr. Clark: Yes.

A Member: Would you advise the average farmer to inbreed?

Mr. Clark: No sir, I would not.

The Chairman: Then you would not advise breeding a sire back to his own daughters?

Mr. Clark: No, not unless I wanted to experiment. A breeder may have to do something that is an experiment and he may get one good animal out of ten and spoil all the rest. Maybe the breeder can afford to do that, but the average farmer cannot.

Mr. Jacobs: Don't you think it would be a safe proposition if you started with the ordinary cow, to breed back in that way?

Mr. Clark: It might be in some instances, but I would not lay down as a principle something I did not know anything about.

Mr. Jacobs: I think that has been tried a good many times.

Mr. Clark: I have tried it myself.

Mr. Jacobs: On a common, ordinary scrub cow?

Mr. Clark: Yes.

The Chairman: I think it is tried there more than any other place, and at a great loss as a rule.

Mr. Taylor: I have been listening with considerable interest to this matter of breeding, as I have made something of a study of it for a number of years. I think that it is the height of foolishness for the ordinary farmer who never had any experience or at best very little experience in breeding, to undertake to breed a sire back to his own daughters, generally speaking. Mr. Jacobs put the question so that you really had to answer it in one way, he said, "If the sire was the right kind of sire."

Now, that is where the rub of the whole business is, if the sire is the right kind of sire. There are but very few successful inbreeders of live stock anywhere in the world, though a few have studied it so closely and watched results so carefully that they have made a wonderful success of it.

For over thirty years I have been following line-breeding in pure bred dairy cattle and I have met with some decided failures and some most excellent successes. Generally speaking, there is somewhere in the sire a weakness that should never be continued and when you inbreed there is danger of intensifying the undesirable qualities in the animal, because you just double it up.

There are two results that will follow:

If I had a bull that was line-bred, and I knew many of his ancestors and knew that he was the only good animal in his family, I wouldn't seek another sire of that same family to use upon his daughters or animals related to him; I would have an entirely different strain.

Mr. Imrie: How closely related?

Mr. Taylor: Pretty close, providing I had the opportunity of observing the physical conformation and constitutional vigor and the other qualities that I was seeking after; I can't say just how close.

If you will pardon me, I will tell you that the result of mat-

ing full brother and sister, which has been very sucessfully done, a most excellent sire, a sire of wonderful prepotency and constitution.

Such men as Governor Hoard, who visited my farm have said to me "You miss the opportunity of your life if you do not mate brother and sister under these circumstances," and it was done, but I want to tell you in the three times, two of the sisters were almost failures as milk-producers, but the best breeding animals I ever have known in my family came from those two sisters. We cannot carry this far.

The males in my herd have been selected for many years with great care and if I live twenty years I know what sires I shall use. We always have in mind, one purpose, one line, and believe in sticking to it.

The ordinary dairyman has a Holstein bull this year, a Guernsey next year. The next year he has a white-faced one, the next year a red one, and if he had horns, maybe he would discard him, and get one without any horns, and it all results in a mixture.

I want to say one more thing. Fellow dairymen, you have the greatest opportunity that has ever been offered in agriculture in the world. You, as dairymen, have more before you to encourage your thought, your education and your energy than any other agriculturist possesses. I want to say to you that as dairymen, as breeders of pure bred live stock, you have a chance to exercise all faculties of a well balanced and well educated mind.

You go into a home and the little boy who is just beginning to write his name with a pencil upon a piece of paper,—why you won't be in that home but a few minutes, before the little fellow will come up and show you how he has written his name and he is proud of it. You visit another home where there is a little girl just growing up to learn how to make her own dresses, her own shirt waists, trim her own hats, or something of that kind, and in a few moments this young lady will come forward with a dress on or a shirtwaist that she has made, and she is very proud to say, "I made that dress myself, it is my own work." Now, we can carry out this thought and we find the dairy farmer who loves to take you out and show you, who will say, "There are ten cows upon my farm the result of my own

planning, my own thought; I provided the brains and raised the feed upon my own farm, I fed a balanced ration to these cows and there they are; there are the records they have made." And surely he has something to be proud of, he is a benefactor, an example many of us can wisely follow; we can tread in his footsteps and be successful.

I tell you, my friends, there is something about that that appeals to us as farmers. If we want to get real happiness out of life, we want to be able to show something that we have done, something we have accomplished.

There are many of us who are proud of special trees that we planted ourselves; we carefully selected a certain kind of a tree that we wanted, we selected the position it should occupy and some of us can sit down under the shade of such trees and we can't help but think how way back thirty years ago we talked it over with the good wife and concluded that in our old age we would need a shade tree right here, and here it is. My mind goes back to a tree in my yard that we planted when we began to fix up our home on the farm. We set out a lot of trees and I remember that there was one maple tree left over, one I didn't know what to do with, so I stuck it in the ground, thinking it would be left there over night perhaps, but while we were doing chores, Mrs. Taylor went out and set that tree out just where she wanted it set. It was near the well, and she said, "Many years from now there will be a great big tree here, our horses will stand under the shade of that tree while they are drinking out of the watering trough." We had one of those old-fashioned watering troughs about eight feet long and two or two and a half feet through and the farmer who was before me on that place had chopped a watering trough out of a log; it would probably hold a barrel, and that was all the tank there was on that farm when I went there; that was the water system of the whole farm, that one log placed on four legs, and Mrs. Taylor set the tree out there and it is now an immense big tree. If five hundred dollars were put down in my hand today I would not take it for that tree, for the associations, the sentiment, and the beauty of that one shade tree.

Now, my friends, let us go just a little further. A man with four boys grown up to manhood and one daughter grown to womanhood had taken this farm from the government and lived

upon it until they were old people. When I went upon that farm there was no gasoline engine, not even a windmill, but that was added the same year and is there yet, and we have a water system in the house and barn; all the water we want right on tap all the time. It goes to the dairy barn and there is a trough between each two cows so they have water all the time. In these days you can have all those things and many more which should more than make you contented and happy with your lot as dairymen, and if there are any conditions or circumstances that need improvement, go right to work and make things just as you want them.

Adjournment to 10 o'clock a. m., next day.

MORNING SESSION.

Friday, February 11.

The convention met at 10 a. m.

Mr. Goodrich in the chair.

The Chairman: Is the report of the committee on Resolutions ready to be submitted?

The following report of the committee on Resolutions was presented to the convention, and after some discussion, particularly with reference to the age limit of the young men to be allowed to conduct tuberculin tests, the resolutions were adopted as follows:

RESOLUTIONS PASSED BY THE WISCONSIN DAIRYMEN'S ASSOCIATION.

Whereas, The citizens of West Salem have done everything possible to assist in making our thirty-eighth annual convention a successful and helpful series of meetings and have provided the members with every comfort and hospitality, therefore, be it

Resolved, That we extend them our sincere thanks as an indication of our appreciation for their many courtesies and kindnesses.

Whereas, By means of the state cow contest it is possible to stimulate state wide interest in better dairying and effect great improvements in the character of our dairy cow. Therefore, be it

Resolved, That this association through its officers and members do everything within its power to acquaint dairymen with the movement and in every way encourage the work.

Whereas, Efforts are being made to induce the directors of the National Dairy Show Association to remove the Dairy Show to another state which we believe less adapted to contribute to its success, be it

Resolved, That we as an association go upon record as unqualifiedly in favor of its retention at Milwaukee where it has been held with success.

Whereas, The laws of this state now provide that all cattle sold after December 1, 1910, for other purposes than temporary feeding or for shipment out of the state shall be tested for tuberculosis, and

Whereas, The members of this association believe that great good may come from the intelligent extension of the test, and

Whereas, We believe that it is not generally known that all men who have satisfactorily passed the examination of the State Live Stock Sanitary Board may make the test and are entitled to charge for their services, be it

Resolved, That this association do everything possible to encourage the administration of the test by any and all qualified and empowered to make it—over 18 years of age.

Whereas, The Minnesota Live Stock Sanitary Board has adopted a ruling which provides that all animals shipped into that state must have been tested for tuberculosis within thirty days of the date of shipment and whereas we believe this enactment unnecessarily adds to the expense of animals shipped into that state and also enables deceptions to be practiced; therefore, be it

Resolved, That we call the attention of the Minnesota authorities to this condition of affairs and ask them to so modify their requirements as to extend the time from thirty days to six months or a year.

Whereas, We believe that oleomargarine should sell upon its own merits and that coloring it yellow to look like butter has given the manufacturer an opportunity to sell his product as butter; therefore, be it

Resolved, That we as an association ask that the present federal law be continued until a law can be enacted to prevent coloring and to force oleomargarine to sell upon its own merits.

RELATION OF CREAMERY OPERATOR TO PATRONS.

JOSEPH NEWMAN, Elgin, Illinois.

Mr. Chairman, Ladies and Gentlemen: It is a pleasure to me to be here in Wisconsin, our sister state. I was here yesterday and saw a splendid audience drinking in the inspiration that was given them from the rostrum, and I was much interested to note the working of this educational work and it is evident from the audience this morning that this interest is being carried on, so many have left their work and come here after knowledge and that is what educators like to see.

The dairy business has been ably discussed from many sides at this meeting and the commercial side of the question seems to interest the farmers most of all, but the business and profit side is not all there is to life, even on a dairy farm, and you will pardon me if I take up a few minutes of your valuable time in trying to show how the "Relation of Farmer and Manufacturer" can be a mutual help in the uplift of their business and the general welfare of the community in which they reside.

By the operator, I take it is meant the buttermaker or foreman in charge of the creamery, cheese factory or condensary, as the case may be, as they do or should reflect the ideals of the owners, hence, the operator should be a person of more than ordinary intelligence, because he has the interests of the factory and dairyman in his hands, and it depends on his wisdom of handling the business intrusted to his care, whether justice is done both parties. With intelligence must be embodied a thor-

ough knowledge of his business especially from a manufacturing standpoint. The more he can inform himself on dairy agriculture, the more of a success will he become in his chosen line of work. By this knowledge he can get close to the farmers by imparting it to them as needed and as occasion presents itself. When the farmer finds such a man at the factory the solution of my subject is easily found, providing the farmer is a man who reads good dairy literature and tries to inform himself on better methods and to reach the ideals in his chosen line of work. This brings two intelligent men together—the rest is easy. Their interests are mutual and helpful.

It's a pleasure to show such a one the details of the Babcock tester and explain why the test is different today than it was yesterday; or to explain why milking with wet hands is a filthy habit affecting both the flavor and cleanliness of the milk; why the pails, cans, etc., in which the milk passes from the cow to the consumer should be kept in a sanitary condition, or start a conversation leading up to the qualities necessary for a good dairy cow and to feed such a cow a balanced ration, to the end that the net profits may be commensurate to the labor and feed used; or to show why a silo will make an acre of corn go farther than feeding it dry; or why a dairy barn should be well ventilated and lighted. Such men, I say, can spend an hour in the country store or school house where others can enter into the discussion and the time be always well spent and helpful to the community, and I venture the assertion that such localities will in a few years have more thoroughbred bulls of a dairy type in their herds and less of the 100-pound butterfat cows, thus bringing up the butterfat standard of the whole state. Such men, by working together, can prove to the world that the true relation of the operator and patron is one of mutual help and the interest of each is best subserved when working together hand in hand, shoulder to shoulder, for the uplift of the dairy interests.

The trouble is, my friends, there is too much ignorance displayed, sometimes at the factory and more often by the farmer selling milk and cream. I use the word "ignorance" believing it to be the kindliest way I can put it for such. There are other words that would apply in some cases, such as skimming the cream from the milk can or watering the milk, selling a cow

to a neighbor after she has reacted from the tuberculin test, adding fat to cream to make it test higher, delivering milk from a diseased cow, etc., etc.

On the other side, by cheating at the scale when weighing in the milk or in reading the Babcock test too high or too low, by incorporating the casein in the butter or more moisture than the law allows, by selling any product from the factory and using the money for themselves, etc. Quite a few of the foregoing are state prison offenses and in time bring their own reward, but for those caused by ignorance we have only pity, and sometimes contempt, knowing that if we look into such factories or farm homes we will not find a dairy paper or book containing the knowledge they so much need. You will not find them buying a postal card to write to the University for bulletins on any subject. That is why I advocated in my own state ten years ago to take part of the money spent on bulletins and use it putting the information in the dairy press and also in the daily or weekly newspapers.

No use gathering knowledge at these centers of education, then taking one and two years to get it printed in bulletin form, which to a great extent are laid up on shelves until they get musty. Give it to the people whose money paid for the work, in a shape they will read and digest the information while it is fresh. Do not stop on one insertion of important subjects, for it is the common people we want to reach and bring up to a higher standard. It is from that class, by reading and studying, have come the great men of the past as well as present, and once reading may not leave the impression desired.

It is this work continued that will weed out the undesirables in both factory and on the farm. So do not get discouraged in your work, keep at it until every factory and every farm reflects the quality of work done at your experiment stations. Let those in charge of education on agriculture keep in close touch with the operators of factories, for it is through them they can best reach the farmers who will not read or attend the "Farmers' Institute" but who most need the information. It was such the Master had in mind when he said "the whole need not a physician." We too often spend the time with men who are congenial and possess the knowledge, when it should

be spent among the "highways and byways" of the human family.

I also know it is discouraging to throw "pearls" before such when for the doing it you will only be rewarded by scoffs and sneers, but rest assured, the factory man who will persistently do it will live to see the fruits of his labors, and the ignorant made to open his eyes to the light. When this occurs, he has made a close friend of the one benefited, who in turn can best spread the dairy gospel among his kind.

Generally, the only way to bring this about is in showing him some change in his methods that will bring him immediately more money for his product. In this, the farmer is no different from men in other lines of business. We have the reputation among nations as being abnormally a commercial nation, and we can see good in education or business only when it produces dollars, and men are so willing to leave the "straight and narrow path" of right, friendship, truth, if there is only something "in it" for them, but we must remember the rank and file of our people are not seen abroad and they should know all the people before coming to such conclusions. If some thought is given to the subject many suggestions can be made how to increase profits and thus get in his good graces.

My experience with the men in charge of factories has been varied. The ideal man is hard to find. When found we are willing to let him have an interest in the business. It is the mutual co-operation between the operator and patron that should be fostered—they need each other's help in working out the great problems in the dairy business. To do it, they must be honest with each other. We must ever remember the old saw "There is more in a pint of milk than has yet been discovered" and when the operator calls the farmers' attention to some unsanitary condition of the milk or cream he is delivering, stop and think of the responsibility resting on his and your shoulders, for the product of the cow is an article of food and the health of the people is entitled to be safeguarded.

We are anxious for strict dairy laws to aid us in stopping the sale of oleo when sold under the name and guise of pure butter. The hog has no right to masquerade in the clothes of dear old Bossie; neither has dirt nor filth any place in food for human beings. The one great thing the operator has to labor with the

patron, is the getting of his milk and cream to the factory in proper condition. Our firm alone has spent a fortune buying machinery to try to remedy the faults of those on the farm caused mainly by simple carelessness in handling the milk and cream before we get it.

It has been demonstrated by Hon. H. B. Gurler, of our state, that when milk is taken from the cow's udder in a sanitary manner, kept cold in proper utensils, it will keep sweet over two weeks, proving that "Cleanliness and Cold" are the two essentials necessary to bring your product to the operator in the best of condition. Why not co-operate with him in this? Those of you who have hand separators why not co-operate with him to see that he gets your cream at least twice a week in winter and at least every other day in summer, and thus do your part in bringing up the standard of quality of butter and cheese in your state. Remember, while the operator can help you, he also needs your help—in fact, cannot make good without it.

One grand, good man of your state has done much to bring the operator and patron together. I refer to Dr. Babcock who gave to the people the now celebrated Babcock tester, whereby the operator can show the patron a correct test of his milk or cream in about six minutes, that will show its market value. If there is such a thing as making men honest, this child of the brain of Dr. Babcock is one of them. All honor to his name. It has placed both operator and patron in a position to "know the truth" and it's the truth that makes men free, and brings them together as brothers in a common interest. Your state has furnished many great, helpful men in developing the dairy interest of not only this state, but the nation. Prof. Henry with his "Feeds and Feeding" has sent a flood of knowledge down the stream of time to those who knew not such a thing as a "balanced ration." Prof. King has shown how to build homes for the animals that are healthy and sanitary. Gov. Hoard is not only working out ideals in a practical way, but has been blessed with the means and power of diffusing this dairy knowledge through the dairyman's bible, "Hoard's Dairyman." It is such helps as these that bring the operator and patron together and make them a power for good; hence I say in the highest sense, their relation is mutual help one to the other.

DISCUSSION.

The Chairman: The gentleman's address seems to be so good and so true that it settles the matter, if we will only follow his instructions.

Mr. Newman: I thank you, gentlemen of the convention, and I will carry back to our sister state association the good feeling which I know exists here.

A Member: One question before you get away: What remedy do you suggest for a creamery operator who has been working dissatisfaction among his patrons for his own personal benefit and behind the backs of the farmers?

Mr. Newman: Dishonesty anywhere in any line of business will bring its own reward. If there has been any dishonesty in the case you refer to, give him all the rope he wants, and if he doesn't hang himself, I miss my guess.

THE GROWTH AND THE PRESENT STATUS OF THE DAIRY INDUSTRY IN WISCONSIN.

J. Q. EMERY, Madison, Wis.

The term dairy is very broad, including among its phases the business arising from milk production, the building where milk is kept and converted into butter or cheese, the store devoted to the sale of milk and its by-products, the dairy farm, the dairy herd, the dairyman, etc.

It is well nigh impossible to clearly picture to the imagination of the present generation the conditions of the dairy industry of Wisconsin in its beginning. The cow was the ordinary native; the dairy barn was a straw-stack; the dairy house, creamery or cheese factory was the farm kitchen, cellar and well; the buttermaker or cheesemaker was the pioneer farmer's wife; the market was the local grocery store and that often many miles away and glutted; the means of transportation was by

foot or perchance by ox team; price five to ten cents a pound for butter, pay taken in brown sugar at twenty-five cents a pound and other groceries at corresponding prices. The cows freshened in March or April, ran at large and were dried off in November or December,—no winter dairying. From my own personal knowledge and experience in the early history of Wisconsin, I am prepared to assert that the foregoing picture is not overdrawn.

The first effective organization for the promotion of dairying in the state was in February, 1872, when on the 15th day of that month, W. D. Hoard, Stephen Favill, W. S. Green, Chester Hazen, H. F. Dousman, A. D. Favill and H. C. Drake met at Watertown and organized the Wisconsin Dairymen's Association. The distinctive necessity which as stated by Mr. Hoard was urged at that meeting for such organization was the low condition of the market, the unmarketable character of the principal portion of our cheese, and the lack of action on the part of buyers to handle our goods. Our only market was Chicago, and three car loads would glut that for a week. We made as a rule a soft cheese, and our only market as a consequence was the home demand and the western states and territories.

Speaking of the conditions of that time, Hiram Smith, whom to know was a liberal dairy education, once said that western cheese in the markets bore about the same relation to eastern cheese that marsh hay does to early blue grass or timothy hay, and the manufacturers had to leave it to be sold in the country stores, one or two in a place, and replenish as sold. Mail carriers and peddlers disposed of all they could. At one time it was feared that the lightning rod man and the insurance agent would have to be called in to aid in disposing of accumulated stock.

Let us briefly contrast present conditions in Wisconsin with those at the beginning of the industry. Where there were at that time no cheese factories, no creameries, no skimming stations, no condensaries, there are now known to be in Wisconsin 1,817 cheese factories, 1,010 creameries, 143 skimming stations and 14 condensaries. The manufacture of butter has been transferred from the farm to the modern Wisconsin creamery. The manufacture of cheese has been transferred from the pioneer farm to the modern Wisconsin cheese factory. The old straw-

stack as a means of protecting the cow from the cold and the storms of winter has been replaced by the modern dairy barn, which more and more is being well-lighted and ventilated, and in which the old, rigid stanchion so promotive of filth and discomfort of the cow is being replaced by the modern stall promotive of cleanliness and comfort. The old time native, scrub, no purpose cow, poor and plastered on both flanks and hips with filth, with hair protruding, hedgehog fashion, back filled with grubs, —a thing repulsive to behold, is being superseded by clean, well-kept, high grade or pure bred, special purpose cows of the dairy breeds,—things not only profitable to the owner, but beautiful and highly attractive to every beholder.

The grocery or general store as a market for butter and cheese has been replaced by the great markets of Elgin, Chicago, New York, and other great modern cities. The cellar as a place of storage has been replaced by the modern refrigerator plant. Instead of the footman or the ox team bearing with slow pace the farm butter to the grocery store market, we now have as a means of transportation for dairy products the modern railway with its refrigerator cars. The milking machine is fast superseding the tedious process of hand milking. Instead of the open, shallow pan for raising cream by gravity, we have the modern cream separator; instead of the old dasher churn, we have the modern combined churn and butter worker run by steam power. Instead of the method of empiricism for manufacturing dairy products on the farm, we have skilful buttermakers and cheesemakers manufacturing butter and cheese in accordance with scientific principles in the creameries and cheese factories which are equipped with all modern appliances for the attainment of perfection in the manufacture of cheese and creamery butter.

For the training of these cheesemakers and creamery buttermakers, we have the great dairy school conducted under authority of the state where they are trained in their respective arts in accordance with scientific principles. In this school the teaching and training is not done by the old time literary methods or mere lectures, or telling how to do, but the school was planned upon the theory that it should be an object lesson for students, and a model for the creameries and cheese factories of the state; that the scrupulous cleanliness of the apparatus, the floors, the

windows, the ceilings, the walls, the receiving room, the brightness and cleanliness of the cans used by the patrons, the fresh, clean and wholesome milk product received for manufacture into butter, the exact weighing and testing of the milk or cream, the quality and just proportion of the by-products returned to patrons, the uniformly excellent product manufactured, the strictly high class, fresh quality of product always supplied to the market, and the integrity used in every phase of the business, should serve as concrete examples to students and as models for the creameries and cheese factories of the state.

In the beginning of the dairy industry in Wisconsin, dairymen were dependent upon empiricism. They merely followed the practices of their fathers and their grandfathers, without concerning themselves about reasons. They had very little, if any, scientific knowledge of the numerous subjects involved in the business. How changed are the conditions at the present! Since that time, in consequence of the Morrill, the Hatch and the Adams acts of Congress, great agricultural colleges and agricultural experiment stations have been established and maintained, where the fundamental purpose is the bringing of new knowledge to light. In these great modern institutions, and notably in the Wisconsin Agricultural College and Experiment Station, great scholars have devoted their time and energy to learning not merely what the Greeks and the Romans knew, as revealed in their literature, but in learning how to read God's thoughts in the great book of nature, and helping to solve the problem how man is to gain dominion over the earth, including among these practical subjects or questions the nature of milk and its various products, the characteristics of the dairy animal and the laws of reproduction, the environment necessary for the highest success in the handling of the dairy cow, the balanced ration, the mode of manufacture of dairy products, the preservation of the same, cold storage, conservation of soil fertility, and multitudes of other subjects, making a complete revolution in dairy knowledge.

Our agricultural colleges, dairy schools, farmers' institutes and dairy press have been teaching to thousands and thousands of dairymen this new knowledge and the method of application of the same. The Wisconsin Dairymen's Association, at first

concerning itself with all the phases of the dairy industry, has gradually specialized its efforts in behalf of the great mass of dairy farmers. Growing out of this organization are the Wisconsin Cheese Makers' Association, the Wisconsin Buttermakers' Association, and the Southern Wisconsin Cheesemakers' Association, whose efforts have been specialized along the line of improving the skill of the cheesemakers and the buttermakers of the state, and of improving the quality of the cheese factory and creamery products. Resulting from this tremendously progressive movement have come our country agricultural schools that are aiding in the improvement of the knowledge and the skill of dairymen in the various phases of the dairy industry.

One function of the dairy and food commission is to arouse motives and stimulate the desire in dairymen, cheesemakers and buttermakers to make a practical use of this knowledge in the way of clean, wholesome and profitable dairy products.

The movements of those various forces have brought such wonderful revolutionary improvements in multitudinous ways as to stagger the imagination; their number is legion.

The Wisconsin dairy industry has developed to the point where the annual value or revenue of the same reached the stupendous sum of $68,497,000. A very careful and conservatively made estimate of the annual value or revenue of the dairy industry of the state, is as follows:

	Number of pounds produced.	Received for, or valued at.
Cheese	165,717,000	$21,166,000
Creamery butter	108,462,000	26,908,000
Butter produced on farms	8,059,000	1,648,000
Milk sold to condensaries	185,609,000	2,249,000
Milk produced on farms other than that sold to cheese factories, creameries, skimming stations or condensaries	646,609,000	8,406,000
Skim milk	2,048,667,000	6,146,000
Whey	1,316,416,000	1,974,000
Total		$68,497,000

As before stated there are known to be 1,817 cheese factories, 1,010 creameries, 143 skimming stations and 14 condensaries in the state exceeding the number of cheese factories and of creameries those of any other state. The estimated number of

cows contributing to these cheese factories, creameries, skimming stations and condensaries is 1,132,700.

According to the statistics gathered by the Secretary of the State Board of Agriculture, the total number of cows in the state is 1,260,000. According to the estimates of the United States Department of Agriculture, there are upwards of 1,500,000 cows in the state.

In striking contrast with the quality and reputation of Wisconsin cheese in its early history, as described by Governor Hoard and Hiram Smith previously referred to in this paper, was the unparalleled exhibit of Wisconsin cheese at the Fourth Annual National Dairy Show in Milwaukee, October 14 to 24, 1909, wherein Wisconsin outclassed and outstripped all competitors, winning first, second and third prizes in the American Cheddar cheese class; first, second and third prizes in the Swiss cheese class; first, second and third prizes in the Brick cheese class; first, second and third prizes in the Limburger cheese class; first prize in the Munster cheese class; first prize in the Club cheese class; first prize in the Fromage de Brie cheese class; first prize in the Neufchatel cheese class; first prize in the Fromage D'Isigny cheese class, and first prize in the Lunch Brie cheese class. Of the 194 Wisconsin cheeses exhibited in that great national show, 182 scored 92 and above, entitling them to the National Dairy Show and Wisconsin Cheese Makers' Association diplomas or awards of merit. Only two of the entire number exhibited scored below 90.

As further showing the extent, variety, quality and rank of Wisconsin dairy products today in competition with those of other states, I call attention to the fact that at that Fourth National Dairy Show, Wisconsin won first prize, the gold medal, for butter made from gathered cream; first and second prizes, gold medal and silver medal, for market milk, also honorable mention and diplomas on the part of three exhibitors; first prize, gold medal, for market cream, also honorable mention and diplomas on the part of three exhibitors; first prize in the creamery patrons' contest, and honorable mention on the part of two exhibitors. It is well known that first class dairy products require for their manufacture, first class raw material. That the volume of Wisconsin dairy products is very great,

has long since been a well-recognized fact. The belief that the quality of Wisconsin dairy products, including the manufactured products and the raw materials is unsurpassed by those of any other state, if indeed it is equalled by any other state, finds confirmatory evidence in the winnings of Wisconsin dairy products at the Fourth National Dairy show above recounted. In further confirmation of this view, I quote remarks attributed by the dairy press to Professor John Spargo, Yonkers, N. Y., as follows: "There is no city of the same size in Europe, I dare say, that has as good a milk supply so far as purity goes, as Milwaukee has." Professor Spargo is also reported to have said that he had inspected several dairy farms of Wisconsin, and never before saw such a general high average of cleanliness.

Professor Spargo's remarks confirm the conclusions reached as a result of an inspection of the city milk supply in forty-four Wisconsin cities, including the city of Milwaukee, made by the Dairy and Food Commission in the months of January, February and March of 1908, and by similar inspections since made. In the inspection mentioned, 596 samples of milk were taken. Of that number, only 5 fell below the legal standard of 3% butterfat, and only 16 fell below the legal standard of solids-not-fat. About one-third of the 596 were tested for chemical preservatives and none were found. Of the total number, 474 samples or about 80%, on application of the Wisconsin curd test, gave curds having a close, firm, even texture, with a smooth, velvety appearance and no undesirable odors, indicating that the milk was normal, was produced under clean conditions and was suitably cared for. That is, 80% or more of those milks were of excellent character and above reasonable criticism as to cleanliness and the care they had received. Inspections of milks since made in the various cities of Wisconsin have shown not only that this high standard of excellence in city milks has been maintained, but has been undergoing improvement.

As typifying the development of pure bred dairy cows in the state in contrast with the pioneer native, I call attention to the following premiums won for Wisconsin dairy cattle at the Fourth National Dairy Show at Milwaukee:

Brown Swiss, Guernsey, Holstein and Jersey pure bred dairy cattle won a total of 145 prizes, of which one was Grand Champion, and four were Champions, 35 were 1st prizes; 27 were seconds; 32 were 3ds; 24 were 4ths; 14 were 5ths, and 8 were 6ths.

The Brown Swiss won 43, of which 13 were 1sts; 8 were 2ds; 8 were 3ds; 6 were 4ths; 4 were 5ths, and 4 were 6ths.

The Guernseys won 58, of which 1 was Grand Champion; 2 were Champions; 13 were 1sts; 14 were 2nds; 14 were 3ds; 11 were 4ths; 2 were 5ths, and 1 was 6th.

The Holsteins won 31, of which 1 was Champion; 5 were 1sts; 2 were 2ds; 8 were 3ds; 4 were 4ths; 8 were 5ths, and 3 were 6ths.

The Jerseys won 13, of which 1 was Champion; 4 were 1sts; 3 were 2ds; 2 were 3ds, and 3 were 4ths.

That the sale of pure bred and grade dairy cattle by Wisconsin dairymen and breeders returns to them a large yearly income which is annually increasing, is certain; but what the figures are, I am unable to state. This highly gratifying condition of things is due in part to Wisconsin's intelligent and aggressive policy of ridding Wisconsin dairy herds of tuberculosis. Were the amount known that is annually received from this source, it could be legitimately credited as an added item of dairy revenue.

I have estimated the number of cows contributory to the Wisconsin cheese factories, creameries, skimming stations and condensaries as 1,132,700. The year book of the United States Department of Agriculture gives the number of milch cows in Wisconsin on January 1, 1908, as 1,392,000. That year book estimates the fertilizer value of the manure produced by each of those cows at $20, making a total annual value from the cows of the state, of $27,840,000. I have not included these figures in my previous statement of the total annual revenue from the dairy industry, yet these figures may legitimately be reckoned as a part of the annual revenue or value of the dairy industry of the state. In this connection I call attention to the statement of Prof. Woll on page 19 of bulletin No. 180, "Fertilizers for Wisconsin Farms," to-wit: "The dairy farmer selling butter loses the smallest amount of fertilizer, the one selling

cream coming second, cheese third and whole milk fourth." This brings us into the consideration of the present development of the dairy farm as compared with other branches of husbandry. The dairyman feeds to his stock all the roughage and all the grain produced upon his farm, and in addition, large quantities of oil meal, bran, distillers and brewers grains, gluten feed, etc., commercial feeds rich in the fertilizer elements, which are constantly being added to our dairy farms, and therefore not only conserving the existing fertility of soil, but adding to that fertility. Intelligent dairy farmers are therefore constantly increasing the productiveness of their farms while at the same time increasing their profits, for it is the business of the dairyman first to produce large crops upon his own farm, which he markets by feeding to his cows, thereby making a profit on those crops which he feeds to his cows, and also making a profit on the dairy products produced by thus making his dairy herd the market for the large crops produced upon his farm. The dairymen are therefore among the pioneers in the present great conservation movement. Resulting from this conservation and increasing of the fertility of the Wisconsin dairy farms and the profits arising from other phases of the dairy industry, comfortable and convenient farm buildings are constructed, and farm homes are maintained wherein the occupants enjoy the necessaries, the comforts, the conveniences and many of the luxuries of life.

As to the sanitary conditions in the cheese factories, creameries, skimming stations and their utensils and premises, in dairy barns, cleanliness of the cans and other utensils used in handling the milk, and in the milk and cream products themselves, very great improvements have taken place in recent years, according to the observation and reports of the inspectors of the Dairy and Food Commission who are devoting their time and energies to this line of work and who are constantly observing these conditions. These improvements include drainage, substitution of cement floors for old, rotten wooden floors; substitution of sanitary pipes for old, rusty pipes; bright, new cans for old, rusty and open-seamed cans, and greater cleanliness of the milk and cream supplied to cheese factories and creameries as well as city milk supplies. Changing conditions in

the dairy industry call for greater knowledge and skill on the part of the cheesemakers and buttermakers and there has been corresponding progress in these particulars. As our inspectors have visited these manufacturing establishments in the performance of their legal duties, inquiring into all the details of the process of manufacture, they have freely given instruction as to the most approved process in the business. Elsewhere and on other occasions, I have given somewhat lengthy and detailed addresses on the various phases of the industry that I have just mentioned, and of frauds upon the industry, which have been published in the dairy press and in various reports. What I have said in those addresses is still applicable to the industry. By a process of natural selection or adaptation, different forms of the industry have developed in different sections of the state.

In bulletin No. 140 of the University of Wisconsin by Russell and Baer, attention was drawn to the different sections of the state where specialized forms of the industry are found. The home of the Swiss cheese industry of the state and of this country is in Green and Lafayette counties. The industry also extends through a portion of Iowa county, a portion of Rock county and also a portion of Dane county. The southwestern portion of Dane county may be said to be the home of the Limburger cheese industry.

One of the centers of the American Cheddar cheese industries is Richland county, from which it extends into Sauk, Vernon, Crawford and Grant counties and the northern half of Iowa county. The great center of the American Cheddar cheese industry is the lake shore and adjoining counties, where the manufacture of cheese is the almost exclusive dairy industry. The home of the Brick cheese industry of Wisconsin is Dodge and Washington counties. The great creamery butter region at first began in the beautiful Rock River Valley, from which it extended over the two southern tiers of the counties of the state as a part of the great Elgin creamery district, and thence northwesterly between the two cheesemaking regions. Central Wisconsin and the counties northward constitute the newer dairy region where the industry is developing along the lines of both butter and cheese. The production and shipping of mar-

ket milk and market cream is reaching extensive proportions in the counties of Kenosha, Racine, Milwaukee, Waukesha, Walworth and Rock and the counties bordering on the Mississippi river and the western boundaries of the state. The number of milk condensaries has increased within the past three or four years from three to fourteen, and the further rapid development of that industry seems likely to continue.

In what I have said of the magnitude of the great dairy industry of Wisconsin, I am sure I have not in the least exaggerated its stupendous proportions. In what I have said as to the progress in various lines of the industry, including the quality of the raw material furnished and of the manufactured products, I have by no means maintained that perfection has been reached, but that great progress in all these lines has been made and is being made. The industry is largely permeated with a spirit of the motto of our state,—"Forward."

It must be conceded that there are obstacles in the way of needed progress. Still better and higher ideals are needed by the patrons of our cheese factories and creameries, by those who supply market milk, by the dairymen themselves, and by the cheesemakers, buttermakers, and managers of cheese factories and creameries. The hand separator that ought to prove a saviour of life unto life, if not wisely used may prove a saviour of death unto death to the industry.

Greed, the holding of a penny so close to the eye that the dollar cannot be seen in the distance, is constantly causing practices of a threatening nature to the industry. For the overcoming of these obstacles there is needed yet higher and better ideals on the part of all engaged in the various branches of the industry and a realization in practice of these ideals; and these enlarged ideals should include the triple elements of integrity, intelligence, and industry as the basic elements of permanent success. With these three elements forming a triple alliance and permeating every phase of the business, nothing can stay its progress.

CLOVER CULTURE.

FOREST HENRY, Dover, Minn.

Mr. President, Ladies and Gentlemen of the Convention: It gives me great pleasure this morning to meet with you in your convention assembled, to talk over these matters regarding our business, and as a dairyman from Minnesota I want to bring greeting to the dairymen of Wisconsin.

This morning we listened to a very able paper from your Honorable Dairy and Food Commissioner, and I was very much interested in it, in that it recited the great and noble work that you have done and are doing in dairying. While I was listening I could not help but feel that there was a good deal of truth in the story that has been told about a Wisconsin dairyman dying and going to his reward. Soon afterwards a Minnesota man died and he also was admitted to the New Jerusalem which he found very much more beautiful than he expected. The streets were paved with pure gold, everything was splendid, but there was one thing he didn't fully understand. He saw men there parading those beautiful streets with balls and chains, and fetters, and he inquired of the good Apostle Peter why that was, and he said, "Well, these are dairymen from Wisconsin, and we have to chain them to hold them here." After hearing this story of Prof. Emery, I couldn't help but feel that there must be a good deal of truth in that statement.

We Minnesota dairymen are very proud of what our state is doing along dairy lines, we are very proud of the quality of the product we are putting out, but we have to acknowledge that you are far surpassing us when it comes to quantity. But now the question comes up, Are we doing it in such a way that we are keeping up the quality of our products as best we can and doing it in as economical a manner as we can. Right in line with that question is the subject of my address this morning, "Clover Culture."

Tomorrow is the anniversary of the birth of the great emancipator, Abraham Lincoln. There is a story told of him that in his early days a certain judge wanted to investigate the finan-

cial condition of a certain attorney and he sent President Lincoln to take an inventory of his property. The report was something like this, "We find that this attorney has a wife and family, valued at perhaps $10,000; he has an office desk that is worth about $10, but way over in the far corner of the office is a rat hole that will bear investigation."

The question came to my mind this morning, while you are doing this noble work, isn't there an opportunity for improvement? Isn't there a rat hole that ought to be investigated? In other words, in doing this work, are you keeping up the fertility of the soil and are you manufacturing dairy products as economically as possible? The time is coming when we must do better than we have done in the past; our consumption is catching up fast with our production. We can only in a small way increase our acreage. How are we going to feed the teeming millions coming to our shores and that are being born among us? There is only one solution to this problem, and that is that we must make one acre of land produce what two acres are now producing, and for my part, I do not know any way in which we may more easily accomplish this than by the use of clover, this wonderful plant.

Fifty-three years ago I emigrated with my parents from Wisconsin to the state of Minnesota. Since that time I have been closely identified with the agricultural work of that state, and something more than thirty years I have been farming on my own hook. We first tried wheat growing, but wheat wouldn't grow for me, and after I tried it five years I determined to drop it, and to start work on entirely different lines.

The farmers of our state were very much discouraged at that time; many of us felt that we had no hope; land dropped in price more than one-half, and it was a very serious question what we should do. I was one of the few that believed at that time that God never made as good a state as Minnesota, and I insisted that it was not right to raise only the one crop. I believed we could carry farm animals and this called for growing corn, but we had reached a condition where we could grow only twenty-five or possibly thirty bushels to the acre, and that of very inferior quality. We drew out all the manure we had, and this helped wonderfully, but we could only keep a little stock

and the question came, how are we to so arrange these matters that we can produce better crops to feed this stock more economically.

I began to read about that time what clover would do with the soil, and I thought I would try it. I was surprised to find that on a piece seeded to clover I could grow just as good a crop of corn the following year as I could on a manured field, side by side, and this was very encouraging. It was not possible to get over the whole area with barnyard manure, but we could go over it with the clover plant, and the more we studied and experimented on this thing, the more we saw its value. It was only a few years before the grain crop worked up to 40, 50 and 60 bushels and for more than ten years in succession, we raised 75 bushels to the acre, largely due to the fact that we had grown clover on that land. In the same way we had increased the capacity of the farm for keeping stock, and taking the two together we had more than doubled the product of the farm.

There isn't a man here but knows what clover will do for the soil, because it has been known for a great many years that it is one of those plants we could grow, and while it was one of the best money crops, furnishing one of the best feeds for the stock on the farm, it increased the fertility of the soil at the same time.

The records show that when we feed this clover to dairy animals, they always give more milk and bring in more profit in the way of butter than on grain feed. We find that claimed even in the old records made by George Washington, and in addition he says that mules fed on clover do better work. Everybody does not know that Washington was one of the best agriculturists in his day; if he had never been known for his achievements along military lines, or as our first great President, he would certainly have been known the world over for his achievements in agriculture. He was simply years in advance of his times.

Now, the question we are interested in this morning, is this, How does clover do this work? It has only been a few years that we have really known how this work came about. Indeed, we have made more advancement in the last forty years along agricultural lines than we did in 6,000 years previous to that.

It has only been within the last forty or fifty years that we have been making very rapid strides. It has only been within the last twenty-five years that it has been really understood how the wonderful work of the clover plant has been accomplished. It was left to German scientists to fathom the mystery.

There are three important elements in the soil, in reality fifteen, but these three must be made available for plants, that is, nitrogen, to make the leaf grow; potash, to strengthen the plant and phosphoric acid to fill out the grain. Of these, nitrogen is the most important, and it costs the most. I find that in the old state of Maine they were paying more than $10,000,000 annually for nitrogen, buying it in a commercial form—fully one-half the value of their crops as taken off the land. I think it is unnecessary.

Where is the source of all nitrogen? It is in the air we breathe; four-fifths of this air is pure nitrogen. What does that fact mean to the Wisconsin and Minnesota farmer? It means that hanging over every acre of your land you have $5,000,000 worth of nitrogen, and if you own 160 acres you are a great deal richer than Rockefeller. It doesn't seem reasonable that the Almighty God should put this mass of wealth just above our fields, within our reach, and then say to us, "You must patronize the commercial fertilizer companies."

The great value of the clover plant is that it will take this valuable asset from the air and put it into the soil. It takes it from the air where it is not in shape to use and puts it into the soil. This work is being done for us night and day, rain or shine, Sundays and other days, all through the growing season, through the means of what are really little insects found on nodules on the roots, and by this process our clover plant will take from the air above through these nodules on the roots, sufficient nitrogen to grow four, five or six crops.

Now, in this way we can incorporate all the nitrogen we desire in the soil without the outlay of one dollar in money, and while we are doing this, we are doing other work equally valuable.

Clover does not put into the soil available potash and phosphoric acid, but it is not for lack of these that our crops are cut short. Our agriculturist will tell us that we have potash in

most of our soils in Wisconsin and Minnesota enough to last us 200 years, and a great amount of the phosphoric acid as well, but they are not in an available form, they are in granules, so to speak, and not in such shape that the plant can make use of these mineral feeds until they are dissolved in water. All plants take their food in liquid form; the water is drawn up through the plant and the plant food left in the plant for growth, and the water is thrown out into the air; the plant can take no food, except as it drinks it; all plants drink to live—and some farmers do.

How does clover help us along this line? When clover rots it forms a slight acidity in the soil which dissolves these mineral plant foods and puts them in a condition so that the plant can take them up and make use of them.

Then again, the clover plant grows differently from most of our farm crops; it grows by means of a long tap root which pumps up that fertility, the potash and phosphoric acid, that have been reached by heavy rains down to the subsoil, leaving it near the surface.

There is another kind of work that the clover plant does; while it is doing the work I have spoken of, it also puts a dense shade on the ground. One of the best conditions known to science for conserving the fertility is cropping the soil. Nothing we can do is better for the soil than to put on a dense crop.

I want to tell you a little story in support of this proposition that close shading of the land does increase the fertility of the soil. I was speaking on our Western border one cold afternoon to a very large audience, and I made the statement that shading the land increased the fertility of it. A young Norwegian sitting back by the door, with a lighted up countenance said, "I believe what you say is true, though I never heard it before. A year ago last summer my neighbor's barn door blew onto my grain field, and it lay there during the entire summer. In the fall we plowed that field and we had to move the door and I thought no more about it, but this year, when I harvested that crop, the wheat stood up head and shoulders above any in the field and that patch took exactly the shape of the barn door. Now what you say in regard to shading land makes it all plain to me."

Another thing that the clover plant does for us—and per-

haps this means more to us in Minnesota than to you in Wisconsin,—but it means more than anything else to us; it puts vegetable matter into our soil, and that is very valuable. Some years we have a big crop; other years our crop is a failure, and we don't know why this happens. Some one says to us "This year was too dry and that was the reason you didn't have a good crop." Then the next year they will tell us it is too wet. If there is anything we can do to equalize this matter of moisture in the soil, we should do it, and there is nothing better than clover growing on account of the vegetable matter we put in our soils.

What is soil anyway? It is simply pulverized rock and vegetable matter. Take away the vegetable matter and it is pulverized rock alone, and you have a soil that will not hold water. Take it in one of those old fields where the vegetable matter has been burned out by continual cropping; the water will percolate into that soil and soon be out of reach of the plant; but, on the other hand, if there is vegetable matter there, it forms a sponge in the soil that will hold the water. When we raise clover on a piece of land, we are putting in a sponge that will help hold the water.

What is the trouble in a wet season? A wet season is nearly always a cold season, simply because our soils run together and shut out God's bright sunlight and air; the soil doesn't warm up and our vegetation is at a standstill. You grow clover on that land, incorporate vegetable matter in that soil, the particles will spread and let in the warm air and sunshine and our vegetation will grow.

The last two years have been very cold and corn has been backward, especially on our old fields; although our frosts came on earlier than usual, our corn did not ripen nearly so well, but on clover fields where corn was planted on clover sod, there was no such trouble, the corn grew and ripened to maturity. We can take any farm and practically place it 200 miles further south by growing clover; we can so change the conditions of that farm that that crop will mature as well as it would on a field 200 miles further south without clover.

But there is another side to this proposition which may appeal to you a little more in a convention than the fertility side

of it. I want to speak of its value as a forage crop on the farm. Alfalfa excepted, there is no hay that we feed to our stock that means so much to us as clover hay, provided it be cut early and cured well, and I want to speak just a few moments along that line. Why is it that clover hasn't the reputation in the market that it should have? It is this, because clover, as a general rule, is sown with timothy, and clover matures first. We sow it with timothy, about two-thirds timothy and one-third clover and then when clover has grown too woody, too much fiber before the timothy is ready to cut, we curse the clover and say it is no good, while if the clover is cut when it should be, we would have one of the most nutritious hays on the market. This is not only true in feeding the dairy cow, but just as true in feeding the horse and all your cattle. If there is any farmer here that feels that well cured clover hay is not good for horses, let me tell him I believe he is badly mistaken. I have fed practically nothing else for thirty years, and during all that time I never have had an animal injured by feeding it. It is not the clover hay that gives your horse the heaves, it is simply indigestion brought on by your forgetting that the horse has a small stomach in comparison with its size, and when you over load that stomach it presses on the lungs, and the horse chokes, becomes windbroken. I tell you that for work horses there is nothing you can feed that will do more good, nor any feed quite so cheap as clover hay.

I made this statement at an Institute yesterday in Minnesota: "We go to our Capitol building that we all appreciate so highly at St. Paul, we look up at it and can't help but admire it. But there is one feeling that always stays with us, and that is the remembrance of the millions of dollars it cost, over $5,000,000, and the farmers of Minnesota are paying big taxes because of that, and I tell you the farmers are paying a tax attributable to timothy hay that means more than five times the cost of that capitol building every year. If the farmers of Minnesota could be induced to raise clover, and feed it in place of timothy hay, they could build five capitol buildings every year and still have money left, and I do not doubt but that is true in Wisconsin as well.

I want to say just a word or two along the line of curing

clover hay. We have not been cutting it early enough, and not giving enough careful attention to curing it. Clover is a plant that soon turns to woody fiber after it reaches the right stage, and a delay in cutting it means the clover is spoiled. To be at its best, clover hay must be cut at full bloom and then I would not over-dry it in the sun. Our practice is to cut it in the morning, and by afternoon run the tedder over it so the dew will fall on the green side and next day, about 10 o'clock, rake it up, put it immediately in the pile and let it cure there. After lying in the pile about four days, it is drawn to the barn. Great care is taken that it shall not be drawn when there is any dew or rain on it. It is carefully stored away, never allowed to pile up in the center, because that means moldy hay. Hay put up in that way only costs a little more to cure it and it is worth double what clover hay is that is put up in the usual manner.

Now, in regard to the comparative value of late and early cut clover hay. It has been my practice for several years to exchange with a neighbor in putting up our clover hay. He wants to put it up about ten days later than I do, so we get through before he is ready. Some years ago I got mine cut and sent him word that we wanted to draw it in the morning. Rain fell for five consecutive days and on one occasion he said, "Forest, when you get ready to haul that manure I will help you." On Saturday afternoon the weather cleared up and Sunday was a bright day, and the piles dried out nicely. On Monday morning, I told him I was ready to go ahead and asked him to bring all the help he could, because I wanted to finish up. When we got to these piles he said, "What a pity to cut such nice clover and let it spoil in the field." He walked up to the first pile and put his fork in it and said, "It isn't nearly as black as I thought it would be; if that had been my hay it would have been black to the bottom of the pile." We turned it over and by Monday night we had the whole field in the mow. Several times he said, "If you hadn't been in such an everlasting hurry and just let that clover stay, you might have had it all in without rain on it."

I said, "Never mind, I will trust that first hay we cut." We took out the last cut hay first and I will acknowledge that it looked rather critical, but after a while we came to the early

cut hay, and notwithstanding those cocks had been there so much longer I naturally expected them not to look so well. When we came to feed that early cut hay the cows increased on an average three pounds of milk over what they had been doing a day while they were fed that which was cut later without a drop of rain on it. I don't want you to understand that it was the five days' rain that put the value in that clover—no, it was the early cutting. That which was cut later had largely turned to woody fiber and lost its value.

I am not so much in favor of the hay loader as a great many are. We have found in our state, where we have kept pretty close tab on the amount of cost in putting up hay, that there isn't near as much difference in the amount of cost in putting up hay by "hand" as we term it, as there is in the use of the hay loader. Indeed, we find that there is a very, very few cents difference to the acre, and not nearly the difference we expected to find, and the quality is very much better in putting up by hand.

I want to say just one word in regard to alfalfa. I know that you are raising a great deal in Wisconsin and under certain conditions I believe it is a right and proper crop to grow, but I do not believe it is for the average farmer. Mind, I am not speaking about one of your best dairymen here. I have been growing alfalfa for seven years and it does not mean one-fourth of what clover does, and I never saw a better field than we are growing. Now, why doesn't it? Simply this, while it does make a better quality of hay, it does not fit into your rotation; it is not in any sense of the word a rotation crop, and while a man on a small area who is running an intensified dairy farm, will manure it, keep up his permanent meadow, that is all right, but it would not apply to a man who has an ordinary farm and practices rotation on his farm. I have found this to be true in all my agricultural experience. I find there is no section where clover does real well where a farmer cares to grow alfalfa, except where you are making dairying a specialty and running an intensified dairy farm.

I thank you for the good attention you have given me.

DISCUSSION.

The Chairman: We cannot go any further this morning, but I wish that every farmer here and every one in Wisconsin would remember every word of this talk by Mr. Henry—except what he said about alfalfa.

Mr. Glover: I think we should discuss this subject a little bit. Mr. Henry says alfalfa does not fit into a rotation, and I am sure he is mistaken. Hoard's Dairyman farm uses it in its rotation, and so do many others.

Mr. Goodrich: I know of farmers that use it in rotation, and it makes the biggest corn crop that ever grew in the country where it is raised; they make it three years alfalfa, two years corn and one year small grain, and I never saw a better rotation. What would be the objection to that?

Mr. Henry: I knew I was in trouble and that is why I did it. You know John Wesley, at one time, had a school, and it was his hobby to send pupils from that school from Sunday to Sunday, to talk in different neighborhoods, to practice at preaching. One night a young fellow who had been out preaching came back, and Mr. Wesley asked him, "Did any one laugh at your talk today?" The young man answered. "No." "Did any one cry?" "No." "Did any one get mad?" "No." Mr. Wesley said, "You needn't go the next time."

Now, I say alfalfa does not fit into a rotation, not such a rotation as we want in Minnesota, nor what I think the majority of farmers want in Wisconsin. I have made that rotation spoken of here on an intensive dairy farm and it is all right and proper, but in the first place as a rotation crop it is entirely too expensive. As a rule we have to sow a nurse crop the first season, and so it is too expensive. I can get practically as much, or more hay, from June clover than I can from alfalfa on my farm. I have gotten six tons of clover hay in two cuttings and we all know that in raising alfalfa the first crop is very hard to cure, because it comes at a bad time to cure hay. The second crop comes right in harvest with us and the third crop comes at a time when it is hard to cure. It is a little too expensive, it is much better as a permanent crop. You under-

stand I am speaking of the average farmer, not the special dairy farmer. On the average farm unless we keep up a four-year rotation, put in clover one year, follow with corn, possibly two crops, small grain and seed it back to clover, the fertility of our farm is going to run down.

The Chairman: We will have to adjourn now. I fancy Mr. Henry has presented his side of the question as well as anybody can, but we will have a little time after dinner to talk about this.

Recess to 1:30 p. m.

The convention met at 1:30 p. m.

Mr. Goodrich in the chair.

The report of the Committee on Nominations was called for.

In that report the following gentlemen were named as officers for the coming year and on motion of Mr. Scribner, duly seconded, were unanimously elected to fill such offices, viz.: For President, H. D. Griswold, West Salem; for Secretary, A. J. Glover, Fort Atkinson; for Treasurer, H. K. Loomis, Sheboygan Falls.

The Auditing committee next submitted its report, which on motion duly seconded, was adopted.

WEST SALEM, Wis., February 10, 1910.

We, the Auditing committee, appointed by President Scribner to audit the Treasurer's account of Wisconsin Dairymen's Association for the year ending February 10, 1910, hereby certify that we have examined said accounts and find them correct.

M. L. WELLS,
H. C. TAYLOR,
C. P. GOODRICH,
G. A. FREEMAN.

A Member: Have you tried alsike clover and how did you find it as compared with other clover as to producing humus and fertilizing the soil?

Mr. Henry: It is not nearly so good a fertilizer as June clover and its root growth is not nearly so great, consequently it does not give as much vegetable matter in the soil. Speaking of alfalfa again, on our dry uplands where we want to practice crop rotation, it is not nearly so well fitted as ordinary June clover; in an ordinary season it does not make half the hay, and where June clover is set thickly, we find an equal quantity of feed as in alfalfa. In practice we sow a little of the alfalfa with the June clover, so we have a variety, and variety means almost as much as quality. The more variety we can get, the better for our dairy cow, and for that reason we sow a little alfalfa and timothy with the June clover. We sow four quarts of the medium red, one quart of timothy and two quarts of alfalfa, but we never see the quart of timothy.

GROWING ALFALFA AND ITS VALUE.

Mr. C. L. Hill, Rosendale.

(Read by Mr. Freeman in the absence of Mr. Hill.)

I want to quote quite at length from a letter just received from a young man who has gone from Wisconsin to New England, and bought a farm there. He spent several weeks in different parts of New England and finally located near a town in which there is a great agricultural college, and where he says the land is unusually good. He writes me as follows under date of January 23rd, 1910:

"The situation in the country about us is very curious, and is a sample of conditions in many New England towns. We are doing pretty well with our herd, and sending quite a lot of cream to Holyoke, at 35 cents per quart for 40 per cent. cream, but all about us the cattle are being done away with. Let me give you a few examples of what my neighbors are doing. First,

a farm of 160 acres which had been in a certain family for generations; badly run down from hay selling; herd of 15 head sold last year; the man now works in a store in town, taking the trolley which passes the door. Nothing is done with the place, but to cut a little hay in old meadows, and place it for sale and no offers. The trolley in New England is a blight on the land as this thing occurs everywhere. It means the man quits working the place, gets in the car in the morning, and goes to town where things are lively, and he can get a job behind the counter.

"Second, a neighbor, with no capital to work with and no business head; tried to carry 40 cows and 20 or more head of young stock of the poorest Jersey scrubs. He peddled milk. The interest on $4,500 mortgage and taxes on the place were not paid for three years. The owner of the mortgage has just foreclosed; the family will step out this spring with nothing but the clothes on their backs. It is a good, level, 120-acre place, right on the trolley; for sale and no offers.

"Third, my second neighbor on the other side has just sold his herd of about 20 head. Thinks he can make more raising hay with chemicals, and I believe he is right in his case, as hay is now $24 per ton delivered, and he has a miserable lot of cows and a Shorthorn bull.

"Fourth, farm across the road from us carried 15 head but owner sold out and moved away. Present owner is plumber in town, farm lies idle. He paid down very little on the place, and the interest on the mortgage is less than his house rent in town would be, perfectly level place of 30 acres with good buildings; former owner made good living; for sale and no offers.

"Fifth, place across the road from this is a good farm with fine orchard, absolutely idle for the last three years, since the owner was paralyzed. He is an old man and lives on his pension.

"Another place of 40 acres just sold to an incorporated fruit company for apple growing. Herd sold off. So it goes, a different reason in each case, but the cattle are going. I think, however, there will be a splendid opportunity for those who stay and develop these farms. In most cases, I have mentioned, it is the old, hard shelled, New England character, and moss grown ideas. The human stock has been inbred too long."

I have quoted thus at length that we may take a look ahead and see what the conditions may be in Wisconsin fifty or one

hundred years hence. It may help us comprehend some of the conditions that confront our agriculture, especially our dairy industry. Note these are not stony, undesirable farms, but among the best in New England, and once worth more than land is now worth in Wisconsin. We won't think that such conditions can never prevail here, but they little dreamed fifty years ago that such conditions would prevail with them. I have seen farms in Wisconsin so impoverished and weed ridden that they scarcely paid for cultivating. Alfalfa is going to do much to restore some of this New England land to a state of usefulness, and the young man whom I quote, is doing well with it on his farm. Few states in the East or North have conditions more favorable for growing alfalfa than Wisconsin, and I soon expect to see the day when vast areas in Wisconsin are devoted to its culture. There is little doubt but that it will do better on limestone soil than where lime does not exist. Most Wisconsin soil is underlaid with some sort of limestone rock. I have seen beautiful stands where soil on top of solid limestone was not over 6 inches in depth, and even less than that.

By all means select rolling land, and the most ideal location is where there is a subsoil composed of broken limestone, but I have seen good stands on nearly every kind of soil from Kenosha to Superior. I began experimenting with alfalfa 11 years ago, and sowed six acres the first time. This piece of land was not rich enough, and little good resulted, although an acre that I sold for building lots produced from this seeding a very fair crop of alfalfa for five years or more, though it was much mixed with June grass. I next sowed in the spring a piece of six acres without a nurse crop. The weeds grew so rapidly that it was necessary to clip it three or four times. This piece yielded the second year three very fair crops of hay, being inoculated between the first and second crops. However there was a good deal of June grass in it, and it all died the second winter without apparent cause, as the ground did not appear to be heaved. It was never as vigorous as it ought to have been. I manured this land and put it in corn, and manured it again in the fall, sowing alfalfa in the spring with one bushel of spring wheat per acre.

This has produced a fine crop of alfalfa the past two years, and better the second year than the first. It was however quite

badly infested with June grass and I have this year manured and plowed it, and will grow corn on it this coming year, but will ultimately put it back to alfalfa. It has been my privilege to see much alfalfa growing in New York and New Jersey, where fall sowing is the almost universal custom. Three years ago I decided that as my land was so infested with June grass, and some of it with noxious weeds, that I would summer fallow a piece and sow it in the fall.

In the summer of 1906 I took 5 acres of land in clover and plowed it as soon as the second crop of clover was off, working it down fine, so it could be driven over in the fall and winter with the manure spreader; gave it a heavy coat of manure from the cow stable, which is, I think, the inoculation it needed. Plowed it again in the spring, and disced and dragged it till the first of August, when it was a very fine seed bed. I then sowed 20 pounds per acre of the best seed I could buy, and it came up in a few days. It was 16 inches high when it froze. There was not a weed of any kind in sight, not even a plant of June grass. Canada and sow thistles that were on the place are dead. Prof. Otis said it was as fine a stand as he ever saw and a friend of mine from New York said he never saw better there, and he grows from 50 to 100 acres. It produced a beautiful crop of hay in 1908, and was 15 inches high when it froze. It was cut three times.

Last summer it did even better, though now there is to be seen once in a while a plant of June grass, but early this coming spring I shall go over it with a spring tooth harrow. At the Illinois Experiment Station last spring, I saw them going over their fields in this way two or three times, and it tore out all the grass and left the alfalfa practically uninjured. Prof. Fraser said they had found it much more successful than the disc, which is so often recommended, or even the spike tooth alfalfa disc.

In the summer of 1908 I treated another five acres in the same way, but it was so very dry that not all the annual weed seeds sprouted, and while the treatment killed Canada thistles and quack grass, some red roots, pigweeds, and the like came up the next spring. On account of drouth, this field was not sown to alfalfa till August 11th, and the alfalfa was only six or eight inches high in the fall, and it looked as though it had a poor chance to live, but in the spring it came on rapidly, and

very soon was as big as the older piece, and last year produced more than the first piece did the first year. No June grass in sight.

Last summer I took a nine-acre piece treating it the same way, but it was so dry that not all the annual weed seed sprouted. I sailed for Guernsey on July 14th and it had not rained for nearly a month and the ground was very dry. I told my man to sow the alfalfa seed August 1st, no matter what the weather was, and he sowed it then in dust six inches deep, but that night there was a nice shower and in three days it was green.

I am now thoroughly convinced that on rich Wisconsin land, where June grass is a weed, it will not pay to grow alfalfa unless we first get the land pretty well cleared of this grass. Several of my neighbors have tried sowing it in the spring as I have with not a single real success. Last year my neighbor tried a fall sown piece and he has a good stand, and at least two others will try sowing a piece in the fall next year. One thing that bothers when the ground is so bare, and fine, and especially on hilly ground, is the washing, and this can be quite largely obviated by dragging around the hills the last time. The seed is covered by dragging as lightly as possible. A heavy coat of manure is very essential to get a good stand, but later top dressings have shown little effect. Do not be afraid of getting the land too rich and make just as fine a seed bed as possible. Sow the seed both ways, about half each time, so that no spots or strips be missed.

The usual advice is to try half an acre or an acre the first year, but I am now so sure that alfalfa can be grown in Wisconsin if we go at it right, that I would advise you all to get in the game as soon as possible. I was fearful that the heavy snow this winter might smother it, but I dug down in several places this week, and there is no frost, and the alfalfa actually looks as if it was growing. I had 75 tons from 15 acres the past season, and the cows are certainly laughing this winter.

It is well to remember in growing and curing alfalfa that a ton of well cured alfalfa hay is nearly equal in feeding value to a ton of wheat bran for which you are paying today $22.00 to $25.00, according to the part of the state you live in. Then plan to make that hay in the best way possible even though it

does take more time. Make caps of cotton sheeting 40 inches square with weights of about ¼ lb. attached to each corner with a string about four to six inches long. If weather conditions are right I cut the alfalfa in the afternoon, and commence to go over it with the tedder as soon as dew is off in the morning. I said cut it if weather conditions are right, and we think them right unless it is raining too hard for man and team to be out. Then if it is not good weather the next day and you are obliged to let it lie one day, it will not be injured if it is not wilted. We continue to run the tedder till leaves begin to rattle which varies from 11 a. m. to 3 p. m., according to the weather, and it is then put in small piles, and caps are put on. It is left in the piles till it is well cured, when often it is drawn to the barn right from the piles, and at other times opened up and dried out. If it is to stay in the piles more than three or four days the piles should be moved so as not to injure the plants underneath.

Almost everybody has now heard enough about the feeding value of alfalfa, so that it is not necessary to emphasize it at this time, but still we do not value it at its true worth, as it improves the land, bringing the fertility from deep down and when the roots are plowed under, the land is, on this account, and from the nitrogen taken from the air, actually richer than before. One thing against it is that it does not fit in well with our rotation of crops but we will soon become accustomed to this, raising our corn and grain on the level land and alfalfa on the hills. Use rich land, get good seed, fit the land well, sow from July 25th to August 10th, and expect a good crop.

DISCUSSION.

Mr. Henry: Mr. Hill made one statement there that hit the nail right on the head. He says the great trouble is that alfalfa does not fit in with your rotation. No one doubts it is a valuable hay, but I was at the station last Sunday and I was talking with one of our boys, and he asked me, "What is the big thing, the farm, the crops we grow, or the stock?" and I said, "It is the farm every time." Rotation is what keeps up the farm and

clover fits in perfectly with rotation. The gentleman makes another important statement there; it helps to keep up the fertility of the soil, and it is true, but the trouble with this alfalfa is we do not get it over our whole farm. It does help the fertility in the field where it grows, but it doesn't help the next field to it.

We must have thoroughly drained soil, in order to grow alfalfa. You have thousands of acres in Wisconsin and we have thousands of acres in Minnesota that will grow alfalfa, provided we make the conditions right, and one is, to get plenty of stable manure on the land.

We never plow manure under, all our manure is practically put on the clover sod. That gives a mammoth crop of June clover and it is left one season and plowed up in the fall and corn put in the following year. I feel that one load of barnyard dressing thoroughly spread on top of the clover field is worth three loads plowed in. If my land is a little poor so I feel I can't get a good stand of June clover, I go over the nurse crop with a light dressing.

Four years ago we added to our farm a little strip that had been tilled forty years without any clover. We sowed it to barley, thinly, not more than a bushel and a peck to the acre, and clover at the same time. Then we put on about five loads of manure to the acre and that season we got 31 bushels of barley to the acre and one of the finest stands of clover I ever had. Late in the season we put on five more loads and then we cut that crop of clover that I spoke of this forenoon, six tons to the acre. We often struck five, but we never got six before.

A Member: How do you sow your clover seed?

Mr. Henry: We sow it broadcast and harrow. Do not sow the nurse crop too thickly and do not let that nurse crop be oats. Oats takes 25 per cent more moisture from the soil than any other crop we grow. In order to grow one pound of oat straw it takes 2,500 pounds of moisture, and in a dry season nothing draws so much moisture as an oat crop. Spring wheat is very good and so is barley, but sow either one very thinly, so that the sun can shine through that growing crop. If it is sown too thickly, when the crop is cut off, it has not seen the sunlight before and the bright sun will burn the life out of it; on the

other hand, if it had been sown thinly so the sun could shine through it, it makes a more vigorous growth and there isn't one time in a hundred but what the clover will grow all right.

Mr. Glover: I know we all appreciate what Mr. Henry has said, and agree with him in most of his statements in reference to clover and alfalfa. But I am sure there is a little misunderstanding in regard to alfalfa fitting in the rotation. Southern Minnesota conditions are a little different than those in Southern Wisconsin; I know that, because I was raised not far from where Mr. Henry lives. It seems wise for me to state briefly what the Hoard's Dairyman farm is doing with alfalfa. Mr. Henry has said alfalfa does not work well in a rotation.

When a piece of land on Hoard's Dairyman farm is sown to alfalfa, about three pecks of barley is sown per acre and about twenty pounds of alfalfa seed. When the crop of barley is cut, the alfalfa comes on and grows well, giving protection for itself during the winter. The field is kept in alfalfa for two years, cutting three crops each year. At the end of the second year, after the third crop is removed, the land is plowed. Corn is planted two seasons when the field is again sown to barley and alfalfa. This constitutes a five-year rotation. Alfalfa is used in the rotation and it has become as sure a crop as red clover. On the Hoard's Dairyman farm some clover is grown, but the yield is not as great as alfalfa. Clover sells for $8 or $10 a ton, while alfalfa hay sells at from $12 to $15 a ton. Surely if Mr. Henry had met with those conditions he would not say that it would not work into the rotation, because on Hoard's Dairyman farm it is being used in the rotation. I have great faith in Mr. Henry's judgment, he is a splendid farmer, but I believe that our conditions in Wisconsin, if he knew them better, would cause him to modify some of his statements.

THE TUBERCULOSIS QUESTION.

W. D. HOARD, Ft. Atkinson, Wis.

Gentlemen and Ladies: I note I am to say something to you on this question of tuberculosis. The program says I am to speak from the standpoint of the law. I would much rather speak from the standpoint of my own experience. I have had no experience with the law, I needed none, you need none. The law of common sense, common ability to reason from cause to effect, a plain, straightforward pride and purpose to keep and breed only healthy cattle is all I needed, all you need to take you by the peril and keep you clear of it. We must be a law to ourselves, or else we will not amount to much.

I think I had better give you a leaf from the chapter of my own experience. When I first established my present farm in 1898, I had four registered Guernsey females and the bull Espanore 2nd of my own breeding. This bull has since become the sire of six cows in the Advanced Registry. I had a newly constructed stable room for 25 cows, constructed under plans furnished by Prof. F. H. King with his system of ventilation. I had to have more cows so I bought grade heifers and cows to fill the stable. I knew nothing practically of tuberculosis, but I had read about it extensively. I was confident that the scientific men who had studied this question clear out to its roots, were not mistaken in their conclusions. So I called in the best veterinarian in the county and told him to test every animal I had. I had bought six fine grade heifers of one man and to my great surprise four of them reacted. I was determined to do no slack work myself, so they were killed and sure enough there it was—not very much developed but it was there. I went to the farmer I bought them of and told him he had tuberculosis in his herd, that I had killed four of the fine heifers I bought of him and found it. He repudiated the idea. Like a good many other farmers he was opposed to a good deal more than he was in favor of.

I kept steadily on testing every six months, and giving my stables thorough disinfection by liberal use of whitewash and

other disinfectants. My neighbors said this was some more of "Hoard's Theories". They were too smart to be "caught in that trap." What a lot of smartness there is going to waste among us farmers.

I had purchased two pure bred Guernsey cows, one on my own risk, the other from a distant portion of the state on the test of a veterinarian who did not know his business. Both proved to be diseased. But I kept two heifer calves from them that are still in my herd, both Advanced Registry cows. The mothers were killed and buried. One other cow was killed. By 1900 I had a herd clean and free of the disease and not a reaction has been had since, although I aim to test regularly every year in November. I have been very careful about buying in animals, keeping any such in quarantine until I could fully determine the validity of the test I bought them on.

In the last seven years I have bought nothing except one bull and two heifers from Guernsey Island. Several cows have died, as they will in all herds, from various causes, but a post mortem has failed in every instance to find the least trace of tuberculosis. When I had completed my first test, I felt that I ought to publish it to the world, in order that sound conviction as to the disease and the efficiency of the tuberculin test might spread among dairy farmers. Every person with whom I advised about making public my experience counseled me against it. They said "It will hurt the reputation of your herd to have it known that you have found tuberculosis there." But somehow I could not see it in that light. It seemed to me that those buyers who were alive to the question, should have all the more confidence in the herd, if they but knew I was bound to banish every trace of the disease. So I published in Hoard's Dairyman the story, and told how it all happened and what the results were. You can imagine how gratified I was when I began to receive letters like this for example:

"I see you are bound to drive out tuberculosis from your herd. Have you any stock for sale?" It has not been a difficult thing for me to keep that herd clear of tuberculosis, nor has it been expensive. The seven animals I sacrificed have been paid for ten times over in three ways: (1) They did not have the chance to spread the disease. That was a big advantage and of great profit. (2) The prices I have sold my cattle at and the

ease I have had in making sales of all surplus stock. (3) In the increased milk production of the herd because they were healthy. Do you not think that a cow is going to do a great deal better at the pail if she has pure air to breathe? Farmers have not got it squarely into their heads yet, that pure air is food. If you have the King system rightly installed in your stables, you are putting additional milk into the pail. Further, if you put all the windows into your stables you can—when you think you have all you can get in, add a few more—you are introducing the most powerful disinfectant known. Light, pure air and the tuberculin test are the three cardinal doctrines to be preached against tuberculosis.

My herd now numbers about 40 cows. Twenty-eight of them have gone through the advanced Registry test with an average of 8,242 lbs. of milk and 446.43 lbs. of butter fat. Mind you, this has been done without changing any of the habits of the herd in feeding, or milking, or breeding. Their ration is the regular one, and they have been milked but twice a day and have borne calves regularly. The balance of the herd have not yet completed the Advanced Registry test. Now there is a record equivalent to 520 lbs. of butter per cow. Could they have done this, think you, unless their health was perfect and the conditions surrounding them—light, ventilation and feed had been right?

Why then should so many farmers be skeptical on this question. Why wait for law, when you can be a law unto yourselves? Why hesitate about putting in the King system of ventilation and taking the pains to put it in right too? I have no more use for the law in this respect than I have in other things. The law is not made for people who are a law unto themselves.

You and I know enough, if we will summon courage, to do as well as we know. Too many of our Wisconsin farmers have acted a foolish part in crying down the tuberculin test. "It is not infallible" they say. Well, who or what is infallible?

Here we are, with the finest future before us as a dairy cattle producing state, with the whole world ready to come to us for our cattle, if we but know enough to do the right thing. Let every man sweep before his own door, clean up his own herd, no matter what the neighbors say. Set up a high standard. Breed towards it, feed towards it, construct your stables for it.

Consider health and efficiency as the first prime objects to attain. Cast off all this foolish prejudice against the tuberculin test.

In December I attended the meeting at Buffalo of the International Committee for the Suppression and Control of Bovine Tuberculosis. Eleven of the wisest men on this subject—with one exception—in both Canada and United States, met there for a two days' consultation. What do you suppose was the united judgment of that body of men as to the prime causes for the alarming spread of this disease? Ignorance and dishonesty. I have shown you how I got rid of my ignorance and I could only do it by being honest towards my cattle and myself. What a cheat that man is who tries to cheat his cows and himself. My advice is to pay no attention to the law except to obey it faithfully by going ahead and acting for yourself. My course has brought me thousands of dollars. A like course will pay you well.

Ex-Gov. W. D. Hoard was unable to attend the convention on account of celebrating his fiftieth wedding anniversary.

VALUE OF RECORDS IN BREEDING COWS.

PROF. HUGH G. VAN PELT, Waterloo, Ia.

Mr. Chairman, Ladies and Gentlemen, I want to congratulate you people of Wisconsin on the great strides you have been taking in the dairy business. Especially since hearing the report of your State Dairy and Food Commissioner, I have been even more impressed with the results you have attained in dairy farming than I was before. Over in Iowa we have been trying to imitate you more or less, because we realize that, although Iowa has been preeminently a beef and pork-producing state, beef and hog products cannot be produced with the certainty of dairy products. Our farmers over there are largely quitting the feeding of beef cattle and hogs in many vicinities, because of this, but they realize that to retain the fertility of their farms,

EMINENT JERSEYS

Adelaide of Beechlands Mollie of Edgewood Rosaire's Olga 4th's Pride Magyarland's Temisia Olive Dunn Star of Weldon Hector's Fairy Belle
Bessie Bates Emma's Rowena Jacoba Irene Financial Countess

The highest producing cow in this group has a yearly record of 17,253.2 lbs. milk and 924.1 lbs. fat; lowest, 9,743.8 lbs. milk and 602 lbs. fat

they must do something that will take the place of the feeding operations of the past. So, we are looking largely to the state of Wisconsin for leadership, for guides for us to follow, so that the state of Iowa may come to be the same profitable dairy state as you have over here.

With reference to the value of records in breeding dairy cattle, I believe it is safe to say that there are four different classes of records which should be given more or less consideration on every dairy farm. These various classes of records are: 1st. The production of milk and butter fat; 2d. The feed records; 3d. The breeding records, and 4th. Show yard records.

Of these four classes of records, undoubtedly the more important are the production records, because the ultimate purpose of all breeds of live stock is production. If you are breeding beef cattle, the ultimate purpose of your efforts is the block, or the beef when the animal is killed; if you are breeding hogs, the ultimate purpose of your efforts is pork; if you are breeding sheep, the ultimate purpose of your efforts is mutton, or wool, or both, and if you are breeding dairy cattle the real ultimate purpose of all your efforts is the production of milk and butterfat. Consequently, these records are all important, and they are a guide or an index showing what you are able to do, or what will be accomplished by your efforts, in breeding dairy cattle.

The pedigree of your dairy animals is valuable or not valuable according to the extent of the records which it contains. If a pedigree for six generations shows a great many good records, demonstrating that the animals which make up this pedigree have been valuable and large producers, or show yard winners, or good breeding animals, which ever the case may be, the pedigree is valuable. On the other hand, if the pedigree contains no animals—or if the history related by the pedigree shows that no animal in that pedigree has ever done anything worthy of note, the pedigree is absolutely worthless, except from the standpoint of demonstrating the purity of the blood.

One of the laws of breeding, which is most familiar to us all is, that "Like begets like, or a likeness thereof." When we have animals whose pedigrees are made up of animals that have been large producers at the pail and the churn, we can, with all reason, expect that the offspring of these animals will also

be large producers of milk and butterfat. On the other hand, if the pedigrees show no animals with records, we cannot, with any degree of certainty, expect record producing offspring. It may be possible that some place back in the generations there have been animals that have been large producers, though we have no certainty of this, nor no guide as to their value, and we have no guide as to what we can expect from the offspring of such animals.

I might say that over in Iowa, and I believe it is true on some of your farms in Wisconsin, and I know it is true in Minnesota and Nebraska and in most of our Western and Central West states—the average cow, or the cow that is being milked on the average farm—is not better, if as good, as the cows that were being milked twenty-five years ago.

Now, this being the case, there is something wrong. The farmer of the Central West, I believe, is one of the most intelligent farmers of the world and he has made great progress in the past twenty-five years. As was said by somebody else, he made more progress in the past few years than was made in the 6,000 years prior to the time of the beginning of this advancement. But here in the Central West the man who is milking the cow has been very busy with other things and he has not given the attention to his dairy cattle that they deserve. He has made wonderful improvements in the character of beef animals he is breeding and feeding, also the hogs and the horses and the farm equipment and machinery, but because of the fact that the dairy cow has been considered a side issue, he has paid very little attention to her and he has kept no records of her performance. As a result comes the unfortunate fact which Prof. Rawl presented to you the other day; namely, that there is a large percentage of the 22,000,000 cows being milked in the United States that have never returned a cent of profit to their owners, and I want to tell you that the reason why this is so is because the people who are milking those cows have not kept records. You will agree with me, because you know absolutely that there is not an American farmer living, who would, knowingly, go out to his barn day after day, and 700 times in a year milk a cow for absolutely nothing, and in many instances hand her a cent for the privilege of doing so.

Now, it is the truth, it is a fact that we know the American

farmer is doing this very thing and why? There is just one reason why he is, and that is because he doesn't know that he is doing it; he doesn't realize it, and there is absolutely no way for him to find out that he is milking unprofitable cows, unless he keeps records of what his herd is doing.

As a rule, I am confident that the dairy herds of the Central West are making nice profits. I believe there are very few entire herds in the United States that are losing money, but the reason that the cows are being milked that are losing money, is because they are intermingled with other cows in the herd and are covered up by the cows which are making large economical yields and large profits.

We find in the testing associations that we have started in Iowa,—and it is found everywhere where testing associations are started and records kept,—that in one and the same herd are to be found two cows standing side by side under identically the same conditions, consuming the same kind of feed and the same quantity, and one of these cows is making a handsome profit and the other cow making an absolute loss. In some instances, we have found one cow in a herd making as high as 400 pounds of butter in a year, and another cow making as low as 100 pounds or even lower. It is just as plain as anything can be that it makes no difference even though one of these cows is eating four times as much feed as the other, requiring four times as much barn room as the other, and four times as much time and care in feeding and milking her, still she is four times as good a cow as the other and much better even than that. With a very little figuring we can see that one cow is worth the other four. So, I say we are not milking these cows that are losing us money not because we want to, or because we don't know any better. We are simply doing it because we have not yet brought ourselves to realize the difference between a good cow and a poor cow, and we never will until we begin keeping the records of the cows. Then we go further than this, we not only milk these unprofitable cows, but we save them, generation after generation, save their offspring and we do not realize that the inherent value of one calf that we are saving for a future dairy herd is far greater than another, because we have not yet brought ourselves to realize the immense value of records. We select our sires in the same way, and even though we have

raised some heifer calves from some wonderfully good cows by mating these with sires whose records we have disregarded and which would reduce them to the class of unprofitable cows, by continuing this practice, some of us have managed to stay just about where we were twenty-five years ago and I presume 5,000 years ago. In other words, we haven't got to a point where we wish to make a change for the better.

That reminds me of what I noticed coming over in the car. A lady stood by the car door for some time and finally she said to a young man, "Will you kindly help me off this car?" He said, "Certainly, I will be glad to." Then she explained to him. "You will notice I am very large and rather old, and consequently when I get off a car I have to get off backwards. I have been trying to get off for the last five stations, and when I go to get off the conductor thinks I am getting on and pulls me back again."

That is exactly what we do when we do not keep records of what our animals are doing for us. It doesn't make any difference how good an individual may be that we have in our herd, whenever we mate her with an animal whose ancestry is poor, we don't know it because there are no records to show it. That sire is the conductor that pulls us back again.

In selecting our sires, we must bear in mind the fact that without records we have absolutely no knowledge of what the animal itself is doing or what its ancestors have done, or what we can expect of the offspring from those animals. By keeping records we of course put ourselves to more or less expense, it takes more or less time, but when we stop to consider the time lost and the money wasted by not keeping records, we are in a position to realize whether or not we can afford to take the time and put ourselves to the meagre amount of expense that is necessary for keeping records from year to year.

Now, the breeder of dairy cattle, as a rule, realizes this. Many of you have heard famous breeders who have been keeping records for many years and they have told you the great value received from keeping records.

Sometime ago I was in Sioux county, Iowa. I met a young man from Holland who told me the history of a part of his life. Nine years prior to the time I met him he came from Holland with very little money, as he said he never expected to own a

cow or a horse, all he expected to do was to make a meagre living. One of his friends in America sent him a ticket to come, he hadn't even money enough to pay for that, though he paid it in the first year he was here and made besides, at farm labor, $300. The second year he made $350; the third, $375, and then he did what most all Hollanders, or any one else does, he got married and moved on a farm. The owner of the farm furnished everything except the horses, and gave him half, and he started to milk cows, because he had milked cows in the old country and knew how to do that. The first year he kept no records of his herd, except that at the end of the year he figured up how much money he had gotten from the creamery and divided it among his cows. I asked him to write it out, and he gave me a letter showing what he had accomplished. The first year the returns from the creamery for his cows showed $28.50 apiece, and he said he realized that that really didn't pay for the cost of feeding the cows. So he thought it over and began weighing the milk and testing it, and getting rid of the poor cows and keeping the good ones, in other words, making records. Then the next year from the 1st of March, 1905, to the 1st of March, 1906, the returns per cow were $36.20; the next year $41.20; the next year $45.84, and last year it was $53.01. He also gave me his figures on the cost of all the feed he gave these cows, and the skimmilk fed the calves and the milk used on his own table, and at the bottom of those figures he has put a figure which shows that his cows returned him a net profit of $36.09.

Now that shows you what that man accomplished by making records, a man who can hardly speak the American language even today. He knows exactly what he is doing and if he had not kept those records he would have been milking yet the same class of cows that he started with and receiving in the neighborhood of $28 per cow, while today he is making a net profit on the average of all his cows of $36.09.

I have a letter from Mr. Auten. I wrote to several breeders, just to learn what their idea was as to the value of keeping records, so I asked him what he paid for Jacoba Irene, the cow that made over 2,700 pounds of butter in three years. He told me not to tell you; but you can realize what a cow without a record going into the auction ring would be apt to bring. He says:

"Of course I have no fixed price on her value now, but she is paying me big interest on a $10,000 investment per annum."

Now, the question is, is her real intrinsic value any more today than it was five years ago when he bought her at the common average of a right good Jersey cow, and do you think that the man who owned and bred this cow would have allowed her to have gone out of his hands had he known what her real intrinsic value was? He would no more have disposed of her at the price he received for her than the man who is milking a cow 700 times a year and paying for her feed without being paid for his efforts would continue to do so if he knew what he was doing.

I also have a letter from Mr. Charles L. Hill, in which he says, "I commenced to weigh the milk of the first pure bred Guernsey I ever owned when she dropped her first calf in 1888, and have weighed each milking of every cow since that time, and as soon as the Babcock test was invented, I commenced, in 1891, to keep fat records of the cows. Any advance I may have made in the breeding or dairy business, and I might say any that I may hope to make, will be founded on the work done in keeping records of the cows. How else can we hope to work improvement? I now have animals whose maternal ancestors for seven generations have yearly milk records, and five generations have official yearly fat records."

The very fact that the man who has not kept records has not made any improvement and that the man who has kept records has made improvements should be sufficient to make us realize the extreme value of keeping records of what our animals are doing. Mr. Hill also sends me some of his records, and among them are fifty-six records of cows, ranging in age from two years old to thirteen years old, with an average milk production of 7,202.7 pounds of milk per year, an average of 377.24 pounds of butterfat.

Now, the question is, did it pay that man to know what he was doing? Has he been paid for the time which it took to do the weighing of the milk, to test the milk and keep the records? When we stop to realize the vast advance that Mr. Charles L. Hill has made in the dairy business, which he attributes to having made records of his work as he went along, we can have some idea of the value of these records.

We all know in Wisconsin what Mr. Gillett did with Colantha 4th's Johanna. We know something about the price he would sell one of her calves. We know he bought one of these calves back and sold it for something like $8,000, and I don't suppose that calf had any more intrinsic value than it had when it sold for $400 or $500.

When I was in Colorado a man told me he had a Holstein bull, he said, "One day I got a telegram from Mr. Gillett who offered me $500 and another one equally as good for that bull. I wired back I wouldn't take it. Then he offered me $1,000 and I wouldn't take it. Then I got a letter from him telling me to keep that bull, and then he told me he was very closely related to Colantha 4th's Johanna."

Now, the question is, was that bull any better than when he first bought it? It was simply the fact that they had found out the real value of the blood of Colantha 4th's Johanna that made the calf valuable.

I also have a letter from Mr. C. I. Hood, in which he says. "No one can estimate in dollars and cents the value of authenticated records and the register of merit. If you could examine the strong, rugged, everyday producing cows in our herd, with their unsurpassed constitutions and dairy characteristics, and then could compare records which show that generation after generation the heifer has done better than her dam, you would begin to appreciate, as we do, the value of those authenticated records. I wonder if breeders of dairy cattle ever thought of what the tests made in the register of merit are worth to the young men who go out from the agricultural college and work among the great herds. An opportunity of this kind to arouse one's interest was unknown a few years ago. This feature of the work leads up to others and competition grows all the while, which ultimately will double and treble the product and profit of this branch of agriculture. The records made at such farms as those owned by the Ladd Estate in Portland, Oregon; T. F. Marston, Bay City, Mich.; A. F. Pierce, Winchester, N. H.; R. A. Sibley, Spencer, Mass.; A. O. Auten, Jerseyville, Ill., are invaluable."

Now, he brings out a point there to which every farmer and every breeder should give due consideration. Every iota of advance of success that every breeder and every farmer makes

from the standpoint of breeding, is made by the sires which he uses, and too few of us have very well bred sires to realize a fact which I am going to tell you and which is just as simple as anything could possibly be, and that fact is this: Whenever we use a sire whose resulting daughters are in the least particular poorer, less valuable or less productive than their mothers, our efforts are an absolute failure; we have accomplished nothing.

On the other hand, whenever we use a sire whose resulting daughters are in the least degree the superior of their mothers, our operations from a breeding standpoint are a success. If the increase in production of the resulting daughters of a cross with a sire produced under the same conditions is only five or ten pounds of butter more a year than their mothers, we are making a degree of success out of our business, and if we continue this success generation after generation, producing daughters that will produce from five to ten or fifteen pounds more butter a year than their mothers, it is only a course of a short time until we will have a herd which is just as good as anybody's herd.

I was impressed with this thought that had never come to me before, in talking with Mr. Gillett. I asked him why he disposed of a certain bull while he was yet young, and he told me that he found that the daughters from that bull did not produce any more milk than their mothers, and that the milk which they did produce was one-tenth of one per cent poorer. He was keeping records, and pretty close records, in order to note so small a difference in production between the mothers and the daughters by the cross of this sire, but that is why that man has made a great and wonderful success, such as we all know he has made, simply through knowing what every sire he has used has accomplished with his herd, and whenever the result was not a profit, that sire was disposed of at once.

So much for records of production.

Now, I believe that along with the records of production we should keep records of feeding, that is, as largely as we can. It probably is more difficult, or a little more expensive to keep feeding records than it is milk records, but still, as far as we can, we should keep feeding records of our animals, realizing that the cow which makes us $35 worth of milk and butterfat and solids-not-fat in the year and consumes only $25 worth of

feed is more valuable to us than another cow which produces the same amount of milk and butterfat and solids-not-fat and does it on a larger amount of feed.

There is another value to be realized if we look at this matter from another standpoint, this matter of making records in our herds, and that is this: I am sure that through the mere making of these records we develop our cows, if we feed intelligently, not overfeed and not underfeed but feed the cow that which she should have to stimulate her to do the very greatest and best amount of work that she is capable of doing. I am sure we develop the cow in the same manner as we do working horses for work, or those bred for speed purposes when we develop them to work or make speed records. So that is something for us to give our consideration to and think about.

I believe that we have had in this country a great many cows capable of making large records, as large even as some of our better cows have made, and the reason they have not made these records or shown that they had the ability to make such records, was because they were not cared for and crowded along and led up to the point where it was possible to develop them and make the records which were later made by other cows.

Breeding records, undoubtedly should be kept, because often times we find individuals capable of making large records in the way of milk and butterfat production that do not reproduce themselves or their characteristics in their offspring, and then of course the real value of these animals lasts only for the one generation and their blood is not carried forward or they are not made a fountain head of a family of great producers. So we should watch and keep records, not only of what individuals do, but also of the other individuals of the same family.

Then another point which we are too prone to overlook, is to determine what the sires used in our herds are really doing for us. I am sure there are many cases, in fact, I have known a great many examples where most excellent sires have been disposed of, in fact, have been slaughtered and gotten rid of before their real value could be determined.

I remember some four or five years ago when I was down in Massachusetts talking to Mr. Julian Hood. He told me that one time his uncle sent him to Connecticut to buy some cows. He bought quite a number, brought them home and began to

milk them, and without exception they are phenomenal cows. His uncle said to him, "You better go back and find out where these cows came from, what their ancestry is, how they happened." So he went back and began inquiring and he found that these cows without exception were daughters of Sophia's Tormentor, and he came back and reported to his uncle. His uncle said, "You go back and buy Sophia's Tormentor, it doesn't make any difference what you have to pay for him. We want him." When he went back, he found they had sold him, but he followed him up, followed him up to another place, and got there just the next day after that poor old bull had been slaughtered. Now, one of those cows in that lot was Marna and she was the only cow that ever defeated Figgis in the show yard, the cow that made a record of something like 675 pounds of butter in her eleventh year and won the grand championship prize at the St. Louis Exposition when thirteen years old. I could tell you many instances of that nature, of just such sires that have been lost because of the fact that one breeder after using him for a time, got rid of him, and he got out of his reach before his real value had been learned. I believe every one of us should take extreme pains never to let the sire we have used get out of our sight until we have fully determined whether he was valuable by the performance of his daughters and whenever in that way we locate a sire that is producing wonderful daughters for our herd, then the thing to do is to keep him his lifetime. It is very seldom that we find a breeder who is fortunate enough to get even one sire that is capable of making him famous, so that we should not run the risk of sacrificing any of our sires until we know whether or not he is a sire that is capable of making us famous.

There is just one more point that I wish to dwell upon briefly, and that is show yard records.

I believe there is value in show yard records, even for dairy cattle. As I said before, I believe there is more value perhaps in milk and butter records, but even at that I am certain there is something to be gained by the breeder of dairy cattle from the show yards. In the first place it fixes the type, it fixes uniformity and it fixes the type of form and conformation which we wish to breed to and as has been demonstrated by Colantha 4th's Johanna, Jacoba Irene, Dolly Dimple and Rena Ross and all

famous cows. A cow does not have to be broken backed or have a tilted udder or a lot of other such unsightly faults in order to make a big record.

Last year at the National Dairy Show I asked the judge of the Jerseys, "Suppose Jacoba Irene was led along in the ring of your show cows and had not received the accident of knocking her hip out of shape, what could you do with her?"

He said, "What could I do with her? A cow with such individuality, such form, I could do nothing but put her clear to the top." These cows that have made phenomenal records conform to types which we desire in the show ring, undoubtedly they would be recognized by expert judges. There is value in show yard records that are realized when we consider the great advantages the beef breeder has had over the dairy breeder through the publicity he has made with his animals, and the advertising he has gained, because his animals have been shown in their best form to the farmers of the country and consequently they have favored beef cattle rather than dairy cattle.

Many of you probably have read of the fact that nobody should buy even a beef bull that was too fat; they should be bought in poor condition rather than fat; but I want to tell you I never in my life saw a buyer of beef cattle—and I have had a good deal of experience in that respect. I have seen a great many expert breeders of cattle select and buy bulls to put at the head of their herds, but I have yet to see the man who would go and buy a sire or a bull that was too poor in flesh, even though he himself had talked hour after hour telling the other fellow not to buy a sire that was fat. Why does he do that? Because, when he sees the two animals together, the one in good flesh and the other not, he is displeased with the one and pleased with the appearance of the other, and consequently he selects the fatter beast, and that is exactly what you will find all human nature doing. If you take two cows and put them side by side, both of them equally good from the standpoint of milk and butterfat records, you will find that the man who is going to buy one of them will always choose even at a higher price the animal which has the appearance of beauty as well as utility. So therein undoubtedly lies the value of show yard records as well as any other.

In conclusion and summing up, I am sure that invaluable are records of all kinds in breeding and developing dairy cattle. The breeder who pays no attention to records will have just as hard a time to make the greatest success out of his breeding operations as he would have in trying to sail across the Atlantic ocean in a ship without a rudder.

DISCUSSION.

Mr. Phillips: Do you suppose the man that sold Yeksa Sunbeam at Minneapolis for $40 or $50 had ever weighed her milk?

Mr. Van Pelt: No, he certainly had not—he might have weighed her milk, but he had not tested it.

Mr. Phillips: Don't you suppose that that friend of yours, who got on so well after he got married, was successful in reaching a profit of $36 because his wife helped him milk?

Mr. Van Pelt: I don't know whether she ever milked or not. I presume that is true, though.

GROWING CORN FOR MILK PRODUCTION.

C. P. BULL, Minnesota Experiment Station, St. Anthony Park.

Mr. President, Ladies and Gentlemen: In our agricultural statistics we have been gathering in connection with different topics that have to do with farmers in our state, we found that stockmen are the most intelligent class of farmers and we have also found that the dairymen are as a rule a little more onto their job than the other classes of stockmen.

The prosperity of a business lies primarily in the cost of production and the net profits. Now, in getting these net profits we must consider the cost of the production.

I want to quote here just briefly from Bulletin No. 48, Bureau of Statistics in the United States Department of Agriculture

and simultaneously published at our Minnesota Station as No. 197, the work being the same thing.

We found in gathering these statistics that the cost of ensilage was something like $18.21 per acre, and that the yield on the average was about ten tons of green forage per acre; corn cut and shocked in the field costs $10.53. We found that when it is hauled to the barn it costs $12.20.

Then there is the cost of the production of an acre of corn grown for ears. Of course the corn has absolutely no value unless hauled from the field, so that would add to the cost. Now, that makes the corn fodder very expensive, and if we could get larger yields as it is possible to get, we could lessen the cost per ton and the whole thing must eventually get down to the cost per ton. In other words, in order to make the most out of our efforts in the production of fodder corn, we must get a very large yield, because the cost of producing these acres remains nearly the same. There are certain things which will influence the yield of corn fodder and in this we must give the soil a little consideration.

Now, what are the methods by which we can get larger net returns? First of all, by increasing the production, which can be done by increasing the fertility of the soil, I mean primarily the addition of humus to the soil.

The reason so many of our Eastern farms are being abandoned and not as productive as they have been and the reason they have to buy commercial fertilizers, is because they have been depleted of their humus, the vegetable matter, that should have been put in the soil and kept there.

There is no method of farming that we know of as yet that will return to the soil a greater proportion of plant food than dairying; it is the one class of farming that removes the least and returns the most. Grain farming, on the other hand, is the one that takes the most out of the soil and returns the least. There must be of course in all classes of farming, if they are going to be ultimately successful, the replacing of these food elements in the soil and the maintenance of a given quantity of humus in the soil.

We can then, in the second place, increase the production per acre by better culture. There are mighty few farmers who give

the proper attention to the preparation of the seed bed, to plowing and the application of manure.

You will recall that the seed put into the soil has a certain amount of plant food stored up in it, which nourishes the little plant until it gets its roots into the soil, and then, in conjunction with the material that the roots may take in, the leaves in the presence of the sunlight will elaborate that plant food and make it useful for the development of the plant. If the soil has not been properly prepared, we will not have a condition favorable to the growth of the young seedling.

Now, if we can fall-plow on average soils—some heavy soils will have to be spring-plowed, but if we can fall-plow, disk thoroughly in the spring, harrow down and topdress with manure, and then plant our seed in a seed bed that is first made fine, and then firm, we will have a condition which will be a congenial one to the development of the young plant.

It is useless to send an animal out to a trough that hasn't any feed in it; it is useless to permit the roots of plants to go into vacant places in the soil. That is in an indirect way what I mean by having the soil first made fine and then made firm. Plantlets growing in that way after they have used up the amount of food stored away in the seed, will be able to grasp enough food from their root system, providing they are the right kind of seed, to keep the plant growing right along.

The next item is in connection with better seed. The quality of the seed used for corn fodder is altogether too poor. I am of the opinion that a man can afford to pay almost as much for fodder corn seed as he can for the seed which he plants for his earing corn crop. Ordinarily you may get seed at the seed houses for fodder corn at about $1.00 per bushel. You can better afford to pay $2.00 per bushel and get a better class of seed than you can buy at the seed houses for $1.00.

You all know that in the selection of seed corn for planting in checks, three or four stalks to the hill for producing ear corn, you select the kernels from the middle of the ear. Those from the butt and the tip of the ear are smaller, and therefore produce the smaller germ.

From experiments we have conducted at the Minnesota Experiment Station we find that the central kernels will yield an

average of ten per cent. more than will those from the butt of the ear by growth measurement, and we find also that those kernels from the center of the ear produce 30 per cent. more forage than those from the tip of the ear. The reasons are plain; those in the central portion of the ear have been normally developed; they received the strong pollen; in other words, the sires of those central kernels have been strong producers. The pollen which fertilizes the silk from the kernels of the tip and butt of the ear is that which has been immaturely ripened. If the central kernels will give you ten per cent. better growth than the kernels from butts and 30 per cent. more than the tip kernels, then it is safe to say that seed from the central kernels will give you the better growth of forage. Those three points are vital in connection with the production of forage.

Now then, a word in regard to the methods of planting. Some years ago at the experiment station we conducted a series of experiments comparing the value of production from different kinds of seeding. We seed, for instance, by hand, in furrows thirty inches apart, plowing the furrows four inches deep. Of course we did not plant four inches deep, but we plowed a furrow four inches deep and covered with the harrow running crossways. Upon that plot we used 150 pounds of seed per acre and that yielded us 14,200 pounds of forage per acre.

In the next plot we sowed by hand in furrows 44 inches apart. We used in this instance, 96 pounds of seed per acre, and harvested 12,000 pounds of forage. In the next plot we sowed in double drills, seven inches apart with a so-called keystone one-horse drill, a drill manufactured for the purpose of sowing fodder corn evenly in the row. We used in that instance 64 pounds of seed and that yielded us just 10,000 pounds of forage. In the next one we sowed in single drill, using 32 pounds of seed per acre in drills 44 inches apart and that yielded us 9,100 pounds of forage. In the next plot we sowed 28 pounds of seed per acre, planting it in hills 22 inches by 44 inches apart, and from this we got 10,800 pounds of forage. And lastly, in the sixth plot, we planted 21 pounds of seed in hills 44 by 44 inches apart in the ordinary check row method and from that we harvested 8,700 pounds of forage.

If we could follow these amounts that I have mentioned as being seeded per acre and the yield in each case, we would find

that the lighter quantity of seed used per acre gives us the smaller yield of forage per acre. There is of course a limit to which you could go in planting that amount of seed per acre and the amount of forage returned that you would get, but we find also another item of importance. With 64 pounds of seed in double drills and 44 inches apart we got 10,000 pounds per acre, and with one-half the amount of seed, 32 pounds per acre in single drills, we got almost as much forage per acre, 9,100 pounds, the difference being very slight.

Further than this, there is another item to be gained here which does not show itself in figures; where we grew the forage with a less amount of seed, the stalks grew larger and there was less digestible nutrients in those, and less palatable also. Where we put on the greatest amount of seed, we not only increased the production per acre, but we also increased thereby the palatability and the digestibility. The lesson that we can gain from this sort of an experiment is this, that by planting in the proper proportion to the acre, we can get the maximum amount of forage and of palatability—if we can call it such—and the maximum of digestibility.

Now, while we can get from the double drills perhaps a greater amount from our seeds, larger crops, there is another item, a practical point, that should be noted. Those double drills lodged more than the single drills did. Where we used a greater amount of seed per acre, the corn lodged more than where we used less. Then the thing to do is to get those two conditions as near together as we possibly can; in other words, planting the maximum amount of seed and the maximum amount of tillage will give us fodder of the best palatability and the largest yield. The experiment was repeated another year and the results were practically the same.

In regard to the kinds of corn to use for fodder purposes, there are at the present time a good many inquiries coming into our station as to what kinds of corn will make the best fodder. In the northern part of the state we almost invariably recommend some of the Flint varieties; in the southern part of the state we say, those varieties you are growing for seed purposes will give you as good results as any.

Not long ago I was talking with a man that claimed he could get better yields, and just as good palatability from southern

ensilage corn, as any other; but I contend that is not the kind of corn we want to grow up here. It may produce a greater amount per acre, but it is not as palatable and it is not as good for silage as the corn we grow here. We want a variety that will yield as much as we can expect it to yield under the conditions that we plant it under, and at the same time mature a good crop.

For early feeding, if the cost of seed is not too large, the sweet corn makes a very good variety to cut or throw over the fence, or into racks for dairy stock to supplement the dry time of pasture. This has been practiced by Prof. Haecker at the experiment station, but the cost of the sweet corn seed, unless we save it ourselves, is almost prohibitive.

The Flint corn varieties will produce slightly more forage than the Dent corn varieties, but as we do not now cut corn by hand, we lose a good share of leaves from the under portion of the stalk by cutting with the binder, and on that account we may not get as good corn fodder, using Flint varieties, as we will by using others. In the long run it is a good deal better to select seed from the corn grown for ears, provided the seed is properly selected.

I quote here from some experiments which were conducted at another state institution, and I will give you the results simply in brief.

The chief points which may be urged against the selection of excessively late varieties of corn for ensilage are as follows: there is much greater bulk in proportion to the actual amount of feed, or feed value, and, second, the greater probability of waste in the manger on account of the refusal of animals to eat very thick and coarse stalks, and third, such corn, while furnishing more dry matter, contains a larger proportion of the less valuable food substances and a smaller proportion of protein and fat, and fourth, immature corn produces a silage that is sourer than that which is mature.

In conclusion, we believe it to be desirable with many kinds of seeds, to separate the seed and discard all except large, well developed, mature and heavy seed, because, first, about 33 per cent. of seeds as placed on the market consists of dirt, chess and small undesirable seeds. This may not be altogether true with corn, but I make the statement simply to show that even the

fodder corn, which is offered for a nominal cost, is not all germinable seeds. I venture to say that the majority of the fodder corn seed obtained commercially, will germinate not more than 75 per cent. The heavy seeds produce healthy, large, well developed plants that will give maximum crops.

There is one other point that I missed in speaking of the good and the poor value of the seed where that seed comes from the central portion of the ear of corn as compared with that coming from the tip and the butt; that is, in the root system. The root system of the poor corn from the butt and the tip of the ear is very limited, and does not develop equal to the root system of the kernels taken from the middle part of the ear.

DISCUSSION.

The Chairman (Mr. Goodrich): We have now come about to the end of our meeting, and it seems to me that somebody ought to make a little bit of a farewell speech. If somebody else doesn't, I will have to myself.

Mr. Phillips: Make it yourself, go ahead.

The Chairman: I want to say that I have enjoyed this meeting immensely. I really didn't think last year that I would ever come to another one of the kind, and my folks, some of them tried to discourage me from coming this time; my grandchildren said, "Grandpa, you can't stand it to go up there." But I have, and I am feeling pretty good yet. I tell you it does me good to get amongst civilized people, and you know dairymen are the highest civilized people in the world. A man that is caring for cows and takes good care of them is a mighty good man.

There are just two kinds of men in this world. I have seen two young men start out and they were practically just alike in their prospects. One man started out and learned the dairy business, and he made a splendid man; he was kind to his cows and when he got married he was kind to his wife and to his children, he was a fine man, all around.

The other man, what did he do? He went to driving teams from the lead mines across the southern part of the state of Wis-

consin; I used to see him coming by my place, going to Milwaukee with a load of lead with six or seven yoke of oxen on a great big wagon, and we used to call those fellows 'bull-whackers,' and when they got through with their loads the oxen were all gashed up, ready to give up and die. What kind of a man do you suppose those fellows made, brought up in such a way as that? I do know that the business that a man is engaged in has a great deal to do with forming his character.

I feel my character is already reformed, because I have been here.

I have enjoyed it always to associate with dairymen, and if you ever come to Fort Atkinson, call on me, come to my house—not all at once,—but I will be glad to see you, and if my house won't hold you all, you can have an overflow meeting at Mr. Glover's, and if he can't take care of you, you can go over to Governor Hoard's, he can take care of a great big crowd of us.

Good-by, and God bless you until we come again.

Adjourned *sine die.*

TREASURER'S REPORT, 1909.

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.

1909.		
Mar. 22.	Balance in hands of treasurer	$1,136 69
Apr. 29.	From state treasurer	1,000 00
Apr. 29.	Memberships	201 00
May 16.	From state treasurer	2,000 00
Aug. 10.	Membership	1 00
Nov. 27.	From state treasurer	2,000 00
1910.		
Feb.	Memberships	4 00
		$6,342 69

Disbursements.

Mar. 2.	F. W. Woll, convention expenses	$8 58
Mar. 2.	Colon C. Lillie, convention expenses	32 05
Mar. 2.	Ray N. West, salary and expenses	126 23
Mar. 8.	Peter Zumkehr, salary and expenses	120 00
Mar. 8.	H. C. Searles, salary and expenses	178 26
Apr. 12.	Peter Zumkehr, salary and expenses	75 00
Apr. 12.	H. C. Searles, salary and expenses	207 96
Apr. 12.	Ray N. West, salary and expenses	166 59
Apr. 12.	F. H. Scribner, services and expenses	65 04
Apr. 12.	Cornish, Curtis & Greene, testing outfit	62 20
Apr. 12.	H. K. Loomis, convention expenses	355 23
Apr. 12.	H. K. Loomis, premiums	60 00
May 8.	Ray N. West, salary and expenses	167 50
May 8.	Peter Zumkehr, salary	110 00
May 8.	H. C. Searles, salary and expenses	187 37
May 12.	H. K. Loomis, traveling expenses	6 30
June 9.	Cornish, Curtis & Greene, supplies for testing	52 60
June 9.	The Bingham & Risdon Co., supplies for testing	25 45
June 9.	Robert Kohli, printing Swiss report blanks	1 50
June 9.	Peter Zumkehr, salary	130 00
June 9.	Ray N. West, salary and expenses	164 06
June 9.	H. C. Searles, salary and expenses	193 13
June 9.	H. K. Loomis, postage	50

June	19.	A. D. De Land, attending ex. com. meeting.....	6 76
July	5.	Peter Zumkehr, salary.....	105 00
July	5.	Ray N. West, salary and expenses.....	161 14
July	5.	H. C. Searles, salary and expenses.....	181 97
July	5.	F. H. Scribner, services and expenses.....	64 75
Aug.	10.	H. C. Searles, salary and expenses.....	175 34
Aug.	10.	Ray N. West, salary and expenses.....	167 65
Aug.	10.	Peter Zumkehr, salary.....	130 00
Sept.	6.	Cornish, Curtis & Greene, acid.....	5 69
Sept.	6.	H. C. Searles, salary and expenses.....	171 43
Sept.	6.	Peter Zumkehr, salary.....	130 00
Oct.	3.	Ray N. West, salary and expenses.....	147 00
Oct.	3.	H. C. Searles, salary and expenses.....	179 81
Nov.	3.	Peter Zumkehr, salary.....	100 00
Nov.	3.	F. H. Scribner, atending dairy meeting at Whitewater	22 72
Nov.	3.	Ray N. West, salary and expenses.....	127 06
Nov.	3.	H. C. Searles, salary and expenses.....	181 27
Nov.	3.	Peter Zumkehr, salary.....	130 00
Nov.	3.	Spence, McCord Drug Co., acid.....	10 92
Nov.	3.	Cornish, Curtis & Greene, supplies.....	1 25
Nov.	3.	H. K. Loomis, postage.....	50
Dec.	9.	H. C. Searles, salary and expenses.....	182 61
Dec.	9.	Ray N. West, salary and expenses.....	164 16
Dec.	9.	Peter Zumkehr, salary.....	100 00
Dec.	9.	F. H. Scribner, attending conv. at Polaski.....	23 08
Dec.	9.	Cornish, Curtis & Greene, repairs on tester....	4 75
Dec.	9.	F. H. Kiser, hall rent.....	6 00
Jan.	9.	Spence, McCord Drug Co., acid.....	5 96
Jan.	9.	Peter Zumkehr, salary.....	75 00
Jan.	9.	H. C. Searles, salary and expenses.....	192 55
Jan.	9.	Cornish, Curtis & Greene, supplies.....	7 16
Feb.	4.	Mandel Engraving Co., halftones.....	11 60
Feb.	4.	H. C. Searles, salary and expenses.....	182 98
Feb.	4.	Fargo Creamery Supply Co., supplies.....	3 65
Feb.	4.	W. D. Hoard Co., printing.....	44 65
Feb.	8.	Express on treasurer's book, H. K. Loomis.....	35
Feb.	8.	A. J. Glover, salary and office expenses.....	322 13
Feb.	8.	Balance in hands of treasurer.....	320 19
			$6,342 69

SECRETARY'S REPORT, 1909.

To the President and Members of the Wisconsin Dairymen's Association:

I have the honor to submit the following report of the expenditures concerning the period from adjournment of our Convention at Barron, February 10, 11 and 12, 1909, to the present time.

Convention expenses	$355 23	
Convention premiums paid	60 00	
		$415 23
H. C. Searles, superintending cow testing association—		
Salary	$1,200 00	
Expenses	1,041 68	
		2,214 68
R. N. West, superintending cow testing association—		
Salary	$540 00	
Expenses	851 49	
		1,391 49
Cornish, Curtis & Greene, supplies	$133 65	
Bingham, Risdon Co., supplies	25 45	
Spencer, McCord Co., supplies	16 84	
Fargo Creamery Co., supplies	3 65	
		179 59
Colon C. Lillie		32 05
F. W. Woll		8 58
H. K. Loomis		7 65
Secretary—		
Salary	$250 00	
Office and traveling expenses	72 13	
		322 13
Mandel Engraving Co.		11 60
W. D. Hoard Co., printing		44 65
Expenses of board meeting		6 76
F. H. Kiser, hall rent		6 00
F. H. Scribner, attending summer meetings		175 59
Southern Wisconsin Cheesemakers' and Dairymen's Assn.		1,206 50
Total		$6,022 50

A. J. GLOVER,
Secretary.

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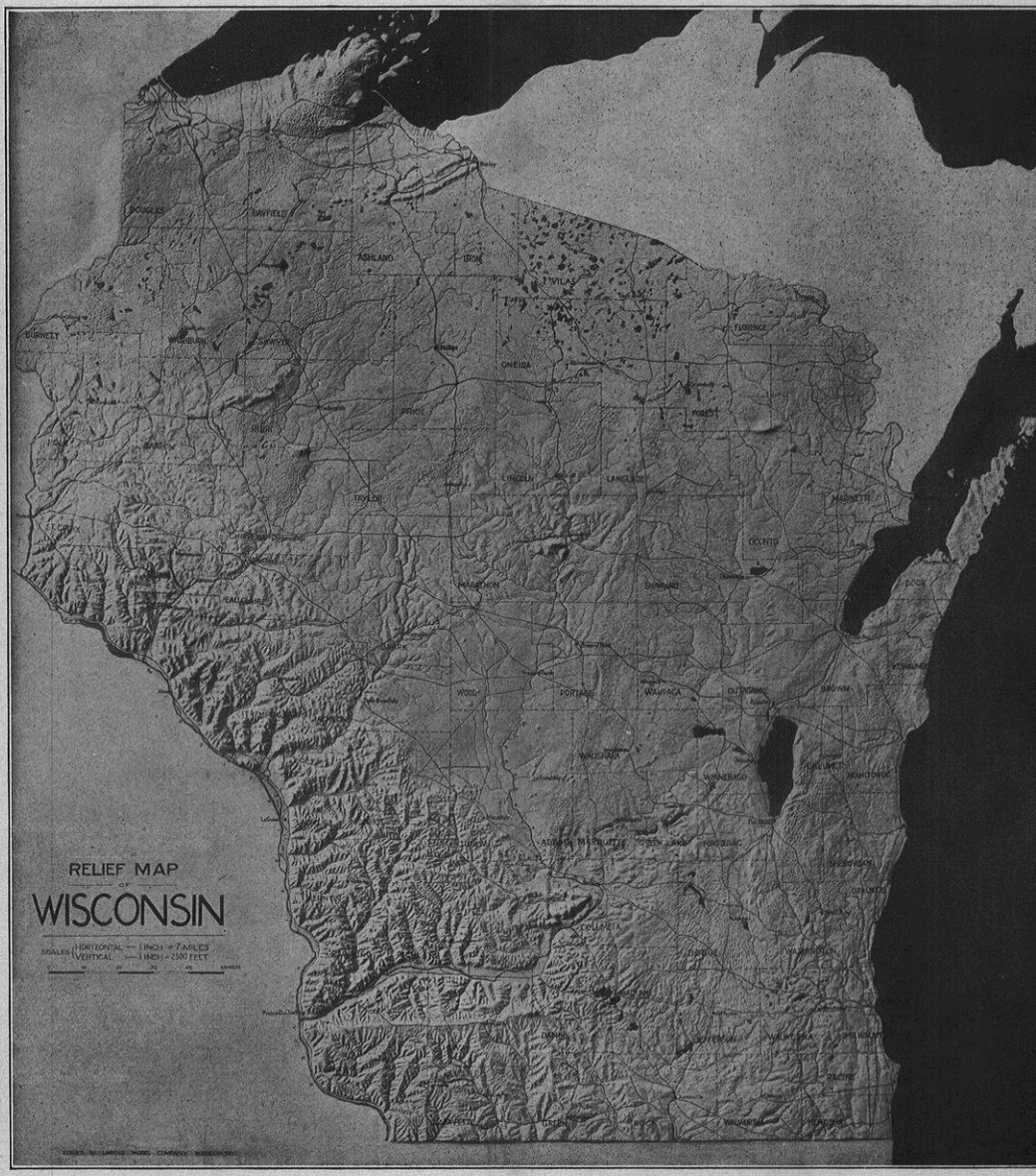

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RELIEF MAP OF WISCONSIN

SEVENTH BIENNIAL REPORT

OF THE

COMMISSIONERS

OF THE

Geological and Natural History Survey

Covering the Period from

July 1, 1908, to June 30, 1910

MADISON, WIS.
DEMOCRAT PRINTING CO., STATE PRINTER
1910

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GEOLOGICAL AND NATURAL HISTORY SURVEY.

BOARD OF COMMISSIONERS.

JAMES O. DAVIDSON,
Governor of the State.

CHARLES R. VAN HISE, *President.*
President of the University of Wisconsin.

CHARLES P. CARY, *Vice President.*
State Superintendent of Public Instruction.

JABE ALFORD,
President of the Commissioners of Fisheries.

SAMUEL F. PLANTZ, *Secretary.*
President of the Wisconsin Academy of Sciences, Arts, and Letters.

STAFF OF THE SURVEY, 1910.

ADMINISTRATION:

EDWARD A. BIRGE, Director and Superintendent. In immediate charge of Natural History Division.

WILLIAM O. HOTCHKISS, State Geologist. In immediate charge of Geology and of Highway Division.

F. G. SANFORD, Clerk.

GEOLOGY DIVISION:

T. C. CHAMBERLIN, Consulting Geologist, Pleistocene Geology.

WILLIAM O. HOTCHKISS. In charge, Geology.

SAMUEL WEIDMAN. In charge, Areal Geology.

FREDERIK T. THWAITES. Assistant, Geology.

R. H. WHITBECK. Assistant, Physical Geography.

FREDERICK W. HUELS, Assistant, Report on Peat.

CHARLES L. DAKE. Assistant, Geology.

HYRUM SCHNEIDER. Assistant, Geology.

WATER POWER DIVISION:

LEONARD S. SMITH. In charge.

HIGHWAY DIVISION:

WILLIAM O. HOTCHKISS. In charge.

ARTHUR R. HIRST. Highway Engineer.

MARTIN W. TORKELSON. Bridge Engineer.

HERBERT J. KUELLING. Assistant Highway Engineer.

BESS C. BREWER. Clerk.

NATURAL HISTORY DIVISION:

EDWARD A. BIRGE. In charge.

CHANCEY JUDAY. Lake Survey.

GEORGE WAGNER. Report on Fish.

F. PINKERTON. Assistant, Lake Survey.

S. D. NOURSE. Assistant, Lake Survey.

DIVISION OF SOILS:

ANDREW R. WHITSON. In charge.

F. L. MUSBACK. Field Assistant and Analyst.

LOUISE JAHNS. Analyst.

L. F. AUGSPURGER. Analyst.

W. E. BLAIR. Analyst.

E. J. GRAUL. Analyst.

A. H. MEYER. Field Assistant.

L. R. SCHOENMANN. Field Assistant.

T. J. DUNNNEWALD. Field Assistant.

O. I. BERGH. Field Assistant.

C. A. LECLAIR. Assistant.

W. E. BLAIR. Assistant.

LETTER OF TRANSMITTAL

COMMISSIONERS OF THE WISCONSIN GEOLOGICAL AND NATURAL HISTORY SURVEY, MADISON.

Office of the President.

July 22, 1910.

HONORABLE JAMES O. DAVIDSON,
Governor of the State.

SIR:—I have the honor to transmit herewith the report of Dr. E. A. Birge, Director and Superintendent of the Geological and Natural History Survey, for the biennial period extending from July 1, 1909, to June 30, 1910, including also a general statement of the work performed by the Survey during the summer of 1910. During this period the regular appropriation for the Survey has been $10,000, and the legislature of 1909 extended for two years a special appropriation of $10,000 annually, to be devoted to the extension of the work on water powers, Southwestern Wisconsin, and especially on highways. The amount granted and the necessities of the last department were such that no money has been expended on water powers, and the full amount of this appropriation has been devoted to highways.

The legislature of 1909 also directed the Survey to investigate and report on the soils of the state and granted $10,000 annually for two years in order to begin this work. The College of Agriculture has cooperated in this survey and the United States Department of Agriculture has given extensive aid. The extent and efficiency of the survey has been nearly doubled in this way. The immediate charge of this work has been placed in the hands of Professor A. R. Whitson and much progress has been made during the first year. The report on the soils of the Bayfield area—already begun by the Bureau of Soils—is now in the press; and the survey of Marinette county

is in the printer's hands. Dr. Weidman, with the assistance of Mr. Musback, has revised and completed the preliminary soil survey of the northwestern area and this report will be issued at an early date.

The Highway division has continued its work along lines indicated in the sixth report. Mr. Hotchkiss and the staff of engineers, Messrs. Hirst, Torkelson, and Kuelling, have greatly benefited the highways of the state directly during their four years of service. Perhaps an even more valuable service has been in educating the people and officials of the state to see the necessity and the advantage of efficiency in the expenditure of money on roads. The passage by a large majority of the constitutional amendment permitting state aid in building highways was no doubt greatly aided by the educational work of the Survey, under the State Geologist, Mr. Hotchkiss. Most of the time of Mr. Hotchkiss has been given to the highway division, both before the election and also with committees of the legislature during the session and with the special committee on highway legislation after the session adjourned. I call especial attention to the recommendations of the Director which deal with the proper manner of organizing the State Highway Department. These embody, in brief, the most important points which have come from careful study of the legislation and experience of other states. No plan should be adopted which does not secure efficiency in the expending of money appropriated by the state. Efficiency of expenditure is the central factor in successful state aid to road building. This can only be secured through a governing body wholly free in personnel and method of appointment from association with partisan politics and which has the fullest opportunity to secure the best talent in the country as road engineers.

The other departments of the Survey need less comment and may be well understood from the Director's report. Work on the lakes and on areal geology has continued about as in the past and several geological investigations have been carried out and are nearly ready for publication. I regret that no extension of the water power survey could be made during the biennial period and also that practically no work could be done in the lead and zinc district. Both these projects were authorized by the legislature of 1909, but the imperative demands of

money for the highway division exhausted the appropriation. This was understood by the committees of the legislature in fixing the amount granted to the Survey. I trust that when the legislature provides definitely for the highways of the state the Survey may use for these and similar important purposes the money now given to the highways and bridges.

Very respectfully yours,

CHARLES R. VAN HISE,
President.

REPORT OF THE DIRECTOR OF THE SURVEY.

To the Commissioners of the Geological and Natural History Survey:

GENTLEMEN:—I submit herewith my seventh biennial report as Director and Superintendent of the Survey under your charge from July 1, 1908, to June 30, 1910. I include also a statement of the work of the Survey during the summer of 1910; thus giving an account of its operations up to the time when the report goes to press.

The income of the Survey for general purposes, during the biennial period has been $10,000 annually; the same as during the period covered in the preceding report. The appropriation of $10,000 annually for two years, made by the legislature of 1907 was continued by that of 1909 (Chap. 458) for an additional period of two years. This sum has been spent almost wholly on highways, and little or no work was done on water powers or on the lead and zinc district during the biennial period. In both 1908 and 1909 the Survey received from the United States Bureau of Fisheries the sum of $500 to aid in field work on lakes; from the Wisconsin Commissioners of Fisheries $250 annually to aid in collecting Wisconsin fishes of commercial value; and personal gifts of $1,200 in aid of investigations.

A most important new duty was placed on the Survey by the legislature of 1909, which established a soil survey of the State (Chap. 403) and appropriated $10,000 annually for two years to begin the work. This investigation is carried on in cooperation with the College of Agriculture of the University and is in charge of Professor A. R. Whitson of that College. The United

States Department of Agriculture has cooperated in the survey and has placed in the field as many men as are employed by the state. Much office work is also done by the Department and its aid practically doubles the amount of work which can be accomplished during the year.

In 1908 Mr. W. O. Hotchkiss was appointed State Geologist and placed in charge of the Highway Division and of all work in geology.

I. PERSONNEL OF THE SURVEY.

The following table shows the organization of the Survey, with the names of the persons who have been employed during the past two years. The amount of money paid to each person, including compensation and allowances for field expenses, is included in the report of the Secretary of State.

Administration:

EDWARD A. BIRGE, Superintendent and Director of the Survey. In immediate charge of Natural History Division.

F. G. SANFORD, Clerk.

Geology Division:

T. C. CHAMBERLIN, Consulting Geologist, Pleistocene Geology.

WILLIAM O. HOTCHKISS, State Geologist. In charge of Geology and of Highway Division.

SAMUEL WEIDMAN, Geologist. In charge of Areal Geology in northwestern area during 1908; in Marinette Co. in charge of soil survey party in 1909.

FREDERIK T. THWAITES, Geologist. Assisted Dr. We'dman during summer of 1908 and Mr. Hotchkiss since that time.

EDWARD B. HALL, Geologist. Assistant in Areal Geology. Employed during field season of 1908 and part of 1909.

EDWARD B. SPRAKER, Geologist. Assisted Dr. Weidman during part of field season of 1909; since worked as chemist on Soil Survey.

E. H. J. LORENZ. Employed part time in making relief map of Wisconsin, 1908–10.

F. W. HUELS. Employed part time on report on Peat, 1908–10.

LAWRENCE MARTIN, Geologist. Physical Geography, summer of 1908.

G. H. COX, Geologist. Southwest Wisconsin, summer of 1908.

Highway Division:

WILLIAM O. HOTCHKISS. In charge.

ARTHUR R. HIRST, Highway Engineer.

MARTIN W. TORKELSON, Bridge Engineer.

HERBERT J. KUELLING, Assistant Highway Engineer.

BESS C. BREWER, Clerk and Stenographer since May 16.

W. C. BUETOW, Assistant Bridge Engineer. (Left Dec., 1908.)

WAYLAND C. WELLS, Clerk and Stenographer. (Died May 16, 1910.)

Natural History Division:
CHANCEY JUDAY, Biologist. In charge of Lake Survey.
GEORGE WAGNER, Biologist. In charge of Report on Fishes. Office work in sorting and arranging collections.
Field assistants, summer of 1908 and 1909.
ROY D. HALL, Chemist. Lake Survey. 1908.
CHARLES T. VORHIES, Assistant. Fish Report. 1908.
H. H. T. JACKSON, Assistant. Fish Report. 1908 and 1909.
R. T. CHRISTOPHER, Assistant. Fish Report. 1909.
GEORGE KEMMERER, Assistant. Lake Survey. 1908 and 1909.

Water Power Division:
LEONARD S. SMITH, Engineer. In charge. Small amount of work in biennial period.

Division of Soils:
ANDREW R. WHITSON, in charge.
CHARLES W. STODDART, Chemist (part time).
LOUISE JAHNS, Chemist.
F. L. MUSBACK, Assistant, Soils.
Field Assistants, Season of 1909.
T. J. DUNNEWALD.
A. H. KUHLMAN.
A. H. MEYER.
H. L. WALSTER.
R. SCHOENEMANN.
E. R. JONES.
GUY CONREY.
EMIL TRUOG.
(See also Dr. S. Weidman, Messrs. E. B. Hall and E. B Spraker, above.)

Besides the persons named above, others have been employed for special services and for short periods as stenographers, draftsmen, compassmen, and for similar temporary purposes.

II. FINANCIAL STATEMENT.

In the following table I have summarized the expenditures of the Survey according to departments, thus indicating the main directions in which the money appropriated by the State has been expended. The result is as follows:

Chaps. 375 (1901); 176 (1903):

	1908–09	1909–10
Administration	$776 18	$1,005 13
Areal Geology	4,021 31	2,834 23
Water Powers	95 00	.....
Economic Geology	2,500 60	2,220 30
Lake Biology	1,936 23	2,564 60
Report on Fish	656 67	266 75
Peat	.....	660 52
Physical Geography	.....	788 90
Lake Chemistry	247 27	.....
Total	$9,985 99	$9,340 43

Chaps. 641 (1907); 458 (1909):		
Highways	$8,853 08	$10,630 31
Physical Geography	697 36	.....
Southwest Wisconsin	501 00	.....
Peat	367 97	.....
Total	$10,419 41	$10,630 31
Chap. 403 (1909):		
Soil Survey	.....	$8,736 69

The expenses for administration include the Director's salary, $500, the pay of the clerk, and expenses for stationery, postage, printing, freight and express, etc., which are not chargeable to special investigations. In each of the years covered by this report the Director spent the entire summer—about three months—in field, office, and laboratory work associated with the natural history investigations of the Survey.

The apparent overdrafts in the Highway fund are accounted for by a balance of about $1400 to the credit of that fund from the year 1907–08. A change in the method of charging the expenses of Economic Geology was made in July, 1909. Previously all of Mr. Hotchkiss' salary was charged to that account and certain special investigations were paid out of the appropriations from Chap. 641. The greater part of that salary ($2500) should have been placed on the Highways account. In 1909–10 the salary was divided between Economic Geology and Highways, and the special investigations placed to the account of the old Survey fund.

The apparent reduction in Areal Geology in 1909–10 was due to the fact that field expenses of 1909 were paid by the Soil Survey. Most of the money credited to Areal Geology in 1909–10 ought properly to go to soils, since most of Dr. Weidman's time was given to that part of the work.

The sums as given in the statement above do not agree with the totals from the table furnished by the Secretary of State. The figures in my report refer to claims audited at this office during the period covered by the report, and always include some claims at the close of the year not included by the Secretary of State and omit at the opening of the year others included by him. The Secretary of State also includes in his report items paid from the general fund for printing and engraving.

III. WORK OF THE SURVEY.

The report of the work of the Survey for the past biennial period naturally falls into three divisions:

1. The investigations carried on under the present permanent appropriation of the Survey.

2. The new work made possible by the special appropriation granted by the legislature of 1907.

Several studies have been done at the expense of both of these funds, and the work of State Geologist Hotchkiss has been divided between investigations paid from both.

3. The Soil Survey, begun under the authority of Chap. 403, laws of 1909.

A. *Areal Geology.* In 1908, Dr. Weidman practically completed the field work for the Northwestern area of some 6,800 sq. miles (See accompanying map). In the field season of 1909 he was engaged in a soil and geological survey of Marinette county, made in cooperation with the Soil Survey of the state and with the U. S. Bureau of Soils. The soil map and report for this country is finished and was sent for publication to the U. S. Bureau of Soils. Mr. F. L. Musback of the Soil Survey assisted in 1909 in revising the soil survey of the Northwestern Area; the soil map is now completed and the report nearly ready for the press.

B. *Lakes.* The studies on the lakes have been continued by the Director and Mr. Juday. The field work has been aided, as before, by a grant from the U. S. Bureau of Fisheries. The report on the dissolved gases of the lakes has been completed and is now in the press.

C. The collecting of fishes has been continued by Mr. Wagner and the collection is now arranged and ready for study. During 1909 Mr. R. T. Christopher, of Fontana, was employed to collect the cisco of lake Geneva, so as to obtain material for a report of the food and habits of that fish.

The following investigations have been carried on under the direct supervision of the State Geologist:

D. *Peat.* A report of the peat resources of the state has been prepared by Mr. F. W. Huels and is now ready for the press.

E. *A geological map* of the state has been compiled by Mr.

Hotchkiss with the assistance of Mr. F. T. Thwaites, and is now in the hands of the engraver.

D. *A relief map* or model of the state has been made, showing the topography and the geology of the state. This has been executed by Mr. E. H. J. Lorenz with great care and attention to accuracy of detail. The map is undoubtedly one of the very best ever prepared of one of the states. Copies of this model will be furnished at cost to schools and public institutions in Wisconsin.

G. *Highway Division.* The work of this division has been carried on vigorously and efficiently under the direction of Mr. Hotchkiss. Something more than $10,000 has been expended each year, including the annual appropriation and the balance carried over from 1907–8. The staff of this division have accomplished far more than appeared possible from the limited funds at the disposal of the Survey and without doubt there have been saved to the towns and counties of the state in highways and bridges, several times the total cost of the Survey in cash, and much more in increased efficiency of expenditure of money.

H. *Division of Soils.* This work has been carried on under authority of chap. 403 of the laws of 1909 and has been one year in operation. The work has been done in cooperation with the College of Agriculture of the State University and has been in charge of Professor A. R. Whitson of that College. Professor Whitson has served without compensation from this Survey. Cooperation of the U. S. Bureau of Soils has greatly increased the amount of work done. This Bureau has placed one man in the field for each man of the Survey and has placed the charge of their work also in the hands of Prof. Whitson. During the field season of 1909 detailed study was made of about 2,175 sq. miles and reconnoissance on about 1,400 sq. miles. In addition the work already done by the Survey on the Northwestern Area has been revised and completed. This includes about 6,800 sq. miles. Much of the time of Dr. Weidman during 1909 was also given to soils as indicated under areal geology above.

I. *Miscellaneous.* Under this head may be mentioned (1) the revision of Bulletin No. VIII on the lakes of Wisconsin, by Professor N. M. Fenneman. (2) The preparation of a bulletin on the Stratigraphy and Fossils of the Middle Devonic of Wisconsin by Professor H. F. Cleland. (3) Dr. Weidman

has been revising a bulletin on the water supply of Wisconsin cities by Mr. A. R. Schultz. The two first named bulletins are in print and the third is nearly ready for the press.

DETAILED REPORT OF WORK.

A. *Areal Geology.* Under this head is also reported work done by Dr. Weidman and assistants on soils. The field work for the report on the northwestern part of Wisconsin was mainly completed during the field season of 1908. This area indicated on the accompanying map of the state (p. 17) includes nine counties, Eau Claire, Chippewa, Rusk, Barron, Dunn, Pepin, Pierce, St. Croix, and Polk, having a total area of about 6,800 square miles. During the field season of 1908, Dr. S. Weidman was assisted by Mr. E. B. Hall and Mr. F. T. Thwaites.

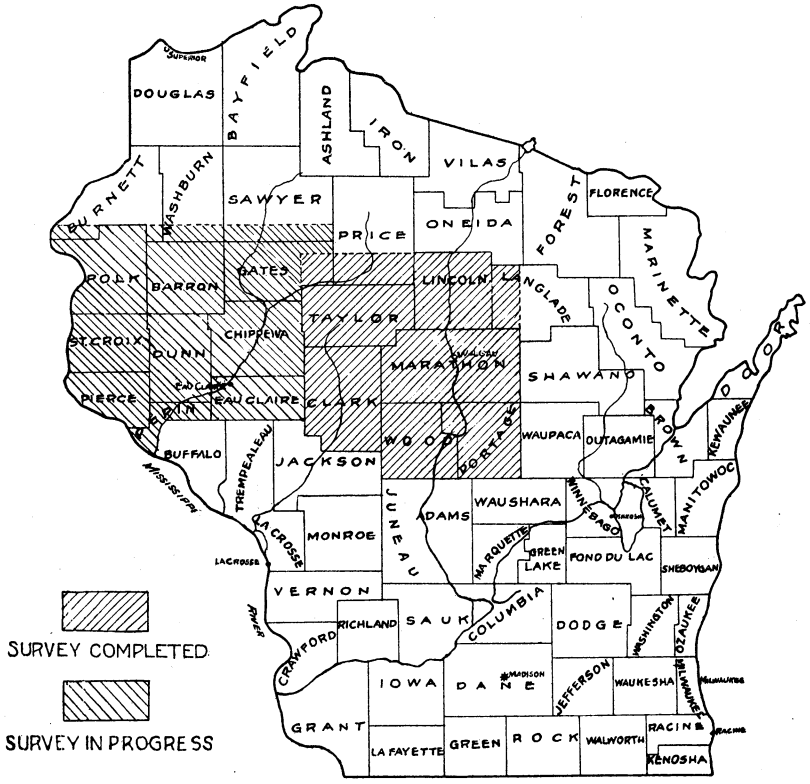
In making the geological survey of this area a preliminary or general reconnaissance soil survey was also made, and in this soil survey work, Mr. F. L. Musback was an assistant.

During the field season of 1909 Mr. Musback was engaged in soil survey work in this area, collecting samples of the soils for chemical analysis. During the season of 1910 some additional soil work has been done on this area in the final completion of the soil survey.

At the present time the soil map is completed, and the report describing the soils and agricultural conditions of the area very nearly finished and ready for the press. This report on the soils in the northwestern part of the state will be very similar to the Bulletin No. 11 "The Soils of North Central Wisconsin." It will be more complete, however, than the latter, on account of additional information made available by the present appropriation for the soil survey. This soil report will be of much value to the farmers of the area, as well as those outside the state who desire good farming land in this part of the state.

The report on the geology of the northwestern area is being completed as rapidly as possible, but some additional field work is required in certain parts of the area and in adjacent territory in order to finish the work in a satisfactory manner. The northwestern part of our state, adjacent to Minnesota, contains many complicated geological features of much scientific importance, and these were being investigated in co-operation, inform-

ally, with geologists of the U. S. Survey, mainly Mr. Frank Leverett, and with geologists of Minnesota, Professors C. W. Hall and F. W. Sardeson. It is desirable that at least the more important geological problems be adequately investigated and described in the geological report, for they are not only of scientific value and interest to the people of Wisconsin, to the schools, teachers, and our general readers, but also to many scientists and students outside the state.



Map showing the location of North Central Wisconsin district.

During the season of 1909, a geological and soil survey of Marinette County, in cooperation with the U. S. Bureau of Soils, was made. The soil map of the county was completed, and the soil report written and sent to the Bureau of Soils at Washington for publication in March, 1910.

The report describes the various soils of the county in con-

siderable detail and will be of much value to the farmers of the county. Especial attention to the character of soils of the undeveloped parts of the county was given, and for this reason the report and map ought to be of considerable interest to prospective settlers of the northern part of the county.

In the geological and soil survey of Marinette county, Dr. Weidman was assisted by Mr. E. B. Hall the first part of the season, and by Mr. E. B. Spraker the latter part of the season. The survey of the northern two-thirds of the county, the unsettled portion was made by a camping party, including the geological and soil assistants, compassmen, cook, and for a part of the time, a teamster.

Besides the geological assistants above named, were Geo. H. Lynes, compassman for part of the season, and James Gray and Thomas Allen, compassmen for the rest of the season. Paul Charron, cook, and H. Brightman, teamster, for part of the season. The U. S. Bureau of Soils representatives in the party were W. G. Smith and P. O. Wood in soils and J. Sazama, compassman. As already stated, the field expenses of the party were shared equally by the State Survey and the U. S. Bureau of Soils.

By means of this plan of cooperative survey the geological and soil survey of Marinette county, an area of 1,496 square miles, cost this Survey about $1.50 per square mile. While the soil survey has been completed, some additional work on the geology will be necessary in connection with the surveys of the adjacent counties of Oconto, Shawano, etc.

Report on Water Supplies. During the year 1904 Mr. A. R. Schultz, assistant geologist on the United States Geological Survey collected a large amount of data relative to wells and underground water supplies of Wisconsin. Mr. Schultz's report was later turned over to the State Survey for publication, and during the past year Dr. S. Weidman has given such time as was available to the revision of this report, getting additional data, and also including descriptions of the river and lake supplies of the cities. When completed this report should be useful to public boards of health of the state as a compilation of all available data in regard to public water supplies, sources of water supply, and the chemical composition of our various waters.

This report will probably contain about 300 pages, including

many tables of chemical analysis of water, and sketch maps showing sources of our water supplies. It is nearly completed and will now be ready for publication.

NATURAL HISTORY SURVEY, IN CHARGE OF DIRECTOR BIRGE.

B. *Lakes.* A full report of the work of this division of the Survey was given in the Sixth Biennial Report and need not be repeated here in the same detail. The work of the Survey on lakes has been directed toward establishing some of the conditions which determine the productivity of these bodies of water. This is a very complex question and can be studied only bit by bit, especially as the Survey can afford only the time of one man to the work. The report on the dissolved gases of the lakes and their relation to the conditions of life in them is now in press. It is by far the most thorough study of the subject that has ever been made and will not only increase our knowledge on the topics immediately discussed but will also serve as a basis for other investigations in the future.

The report discusses the following topics:

I. Number, location and depth of lakes.
II. Methods of investigation.
III. The distribution of oxygen.
IV. The distribution of carbon dioxide, both free and combined.
V. The distribution of nitrogen, carbon monoxide, and methane.
VI. Mineral and sanitary analyses.
VII. Relation of chemical and biological conditions.

The nature of the report is well indicated by the following paragraph from the Sixth Report:

"The Survey has brought material for a much more complete report on the fundamental conditions of life in lakes than has ever been collected before. The course of the investigations also has made it plain that the demands of the future are rather for a careful and consecutive study of the facts in single lakes carefully selected as types, than for more numerous observations scattered widely over different lakes. The importance of the facts which have been ascertained has become increasingly plain, and as would be expected, the difficulty and the complexity of the

study have appeared also. The physical and chemical problems of lake biology are nearly as complex and difficult as are those of the soil and need to be studied by the same careful, patient, continuous and extensive methods. The report will constitute an introduction to such work. It will sketch the general facts of the physical and chemical conditions of life in lakes, but it will suggest far more problems that it will be able to solve."

The U. S. Bureau of Fisheries has continued the assistance given in former years and has aided to make the field work much more extensive than would have otherwise been possible.

The Director has published four brief papers during the biennial period, relating to the studies made on lakes.

1. An unregarded factor in lake temperatures.

2. On the evidence for temperature seiches.

Both printed in the Transactions of the Wisconsin Academy, Vol. XVI, Part II.

3. Gases dissolved in the waters of Wisconsin lakes. Read at the Fourth International Fisheries Congress, Washington, 1908; and printed in the Bulletin of the Bureau of Fisheries, Vol. XXVIII, 1910.

4. The apparent sinking of ice in lakes. Science, N. S. Vol. XXXII, p. 81.

C. *Fish.* In the summer of 1908 collecting was carried on in the western part of the state, Mr. C. T. Vorheis conducting the field work with the assistance of Mr. H. H. T. Jackson. After August 1 Mr. Vorheis withdrew and Mr. Jackson with an assistant carried on the work within the drainage area of Lake Superior and on that lake itself. Thus by the end of this season collections had been made in all parts of the state. During the summer of 1909, Mr. Jackson gave his time to those inland lakes which were supposed to contain whitefish and secured considerable collections. No field work has been undertaken in 1910, chiefly because there is no room in Science Hall to store specimens.

All specimens so far collected have been sorted and catalogued and are ready for detailed study. Much of the time during the past two winters has been devoted to gaining a knowledge of the whitefishes; this work is now almost completed and an account of the *Salmonidae* of the state will probably be written next winter. In the course of the work it ap-

peared that some specimens of cisco from the deep waters of Lake Michigan were different from any known species and Mr. Wagner described them as *Argyrosomus johannae* in Science, N. S. Vol. 31, p. 957. He also found that the stickleback of Lake Superior, described as a new species by Agassiz, and long supposed to be different from the form in the other waters of the state, is not entitled to a separate name. (Science, N. S. Vol. 32, p. 28.)

During 1909, an effort was made to ascertain the depth-migrations, if any, of the cisco of Lake Geneva. Mr. R. T. Christopher of Fontana was employed to collect the fish throughout the open season. A good many myths have arisen concerning the form in Lake Geneva, due chiefly to its sudden and spectacular appearance at the surface in June, at the time of the emergence of the certain species of May-flies on which it feeds. Our work seems to show clearly the following: The cisco during the period that the lake is free from ice, shuns the shallow water along the shore. Outside of this, they seem to occur at all depths at all times, even to the deepest parts of the lake. From these last, however, they are excluded by the absence of oxygen in the bottom water after the middle of summer. The nature of the catches indicates that they travel in large schools rather than singly. They favor certain areas of the lake, for reasons at present unknown. During the season of our observations their food consisted almost wholly of copepods. In winter, however, the fishermen use minnows exclusively as bait. Spawning evidently takes place in November, though weather conditions prevented us from carrying our observations through this period.

GEOLOGICAL WORK IN IMMEDIATE CHARGE OF W. O. HOTCHKISS.

D. *Peat.* A report on Peat, by Mr. F. W. Huels, has been prepared under the direction of Mr. Hotchkiss and is practically ready to be sent to press. The following outline shows the manner in which the subject has been treated:

Introduction.

Part I. Origin, Occurrence and Characteristics of Peat.

Chap. I. Peat, its origin, occurrence and characteristics.

Part II. The Peat Deposits of Wisconsin.
- Chap. II. The formation of peat in Wisconsin.
- Chap. III. Prospecting and testing peat deposits.
- Chap. IV. The peat deposits of Wisconsin prospected in 1903.
- Chap. V. The peat deposits of Wisconsin prospected in 1908.
- Chap. VI. Summary of the characteristics of Wisconsin peat.

Part III. Attempts to develop Wisconsin Peat Deposits.
- Chap. VII. The manufacture of produce gas from Wisconsin peat.
- Chap. VIII. The products of distillation of Wisconsin peat.
- Chap. IX. Wisconsin peat and its by-products.
- Chap. X. The manufacture of Wisconsin peat into fuel.
- Chap. XI. Miscellaneous attempts to utilize Wisconsin peat.

Part IV. Possibilities of the Development of a Peat Industry in Wisconsin.
- Chap. XII. Peat as a fuel.
- Chap. XIII. Gas from peat.
- Chap. XIV. Peat as a raw material other than fuel.
- Chap. XV. Some factors influencing the successful utilization of a peat deposit.
- Chap. XVI. Conclusions.

Appendix A. T. C. Chamberlin on Wisconsin peat deposits.
Appendix B. Bibliography.

E. *New geological map of the state.* Owing to the fact that for a considerable time there has been no geological map of the state available for distribution, Mr. Hotchkiss, assisted by Mr. F. T. Thwaites, has collected and put together geological data from surveys that have been made since the last geological map of the state was published. This information has been embodied in a geological map of the state which is now in the hands of the engraver and will be ready for distribution probably some time during the winter of 1910–11.

In making this map the present base of the state railroad map was enlarged and corrected from information obtained from many sources. In making these corrections, the maps and rec-

ords of the present survey were used; also topographic sheets of the United States Geological Survey; unpublished maps by Samuel Weidman and Dr. Birge of this Survey, and by Wm. C. Alden of the United States Geological Survey; various county maps, detailed railway surveys, etc. The geological formations as shown on the old geological map of the state were corrected from published reports of this survey and the United States Geological Survey, also from unpublished works by Samuel Weidman of this survey, and by Wm. C. Alden of the United States Geological Survey.

Information was obtained in connection with the work of the highway division which permitted of the construction of a complete road map of the state. The roads are shown in a special color on the geological map. Arrangements have been made with the State Automobile Association to indicate the main traveled automobile roads on the proof of this map, so that the map will be of great value to tourists. The map will be published on a scale of six miles to the inch, which will make a wall map about 52 by 54 inches.

F. *Model of Wisconsin.* A relief map of the state was completed early in 1910. This model was made under the direction of Mr. Hotchkiss, from information collected by him and Mr. Thwaites. The modeling was done by Mr. E. H. J. Lorenz, an expert model maker who was employed by the survey for this purpose. The model gives an excellent idea of the topography of the state. It was constructed in a careful manner so as to show the hills and valleys as accurately as could possibly be done on the scale adopted, the horizontal scale being seven miles to the inch and the vertical about 2,500 feet to the inch. This model was made for use in the various educational institutions of the state and in state departments for exhibition and similar purposes, and copies are supplied for these public uses at the cost of manufacture. The entire cost of the original model has been borne by the Survey.

The cut of the model which is given herewith, together with the following description which is taken from the title on the model, gives a good idea of the topography of the state.

THE SURFACE OF THE CRYSTALLINE ROCKS.

"Wisconsin possesses a great variety of topographic forms. The oldest is a great area of crystalline rocks worn down by long ages of weathering and stream action from an original condition that must have been more or less mountainous to a gently rolling surface above which the remnants of the hardest rocks project as hills. This type formerly existed over the whole surface of the state but now is best shown in Marathon County.

"On this old flat surface the sea deposited the sandstones, shales and limestones, the existing parts of which now cover, in crescent shaped belts, the southern half and the eastern and western edges of the state, and a small area around Ashland and Superior.

THE SURFACE OF THE LATER ROCKS.

"When these later rock formations were raised above the sea the streams and weather began to wear them down. The weaker rocks were worn away rapidly and the stronger rocks more slowly. As a result there are prominent limestone ridges, as Military Ridge, extending from Madison west to the Mississippi River, and the Niagara Escarpment making the eastern edges of Green Bay and Lake Winnebago and extending south to Waukesha County. As a result of this differential resistance to erosion there are narrow valleys in the limestone and wide valleys in the sandstone and shale. The Wisconsin river illustrates this. Its mouth is in resistant limestone and the valley is narrow. South of Richland and Sauk Counties the valley is in weak sandstone and is much wider.

"The resistant limestones stand as continuous ridges, as in Grant and Crawford Counties, but where the sandstone forms the divides it has been eroded to a much greater extent, as in Buffalo, Trempealeau and Monroe Counties, leaving more or less isolated peaks where the ridges once were. This process was carried further in Jackson and Juneau Counties where the sandstone was worn to a great sandy plain with only a few harder parts of the sandstone projecting as mounds above the general level. The soft Cincinnati shale was also cut away

to form the interior lowland in which Green Bay and Lake Winnebago lie.

THE GLACIAL FEATURES.

"After the surface of the state was developed to about this stage great ice sheets from the north covered all but the southwest quarter of the state. This Driftless Area shows the kind of topography that existed in the other parts of the state before the glaciers came. These glaciers moved across the country, wearing down the hills somewhat and filling up valleys, sometimes to a depth of 500 feet with the boulders, gravel, sand and clay which they carried. The old drainage systems were thus obliterated, and thousands of lakes and swamps were formed in this uneven glacial drift. Numerous waterfalls and rapids also resulted, giving many sites for the development of water power.

"The large amount of silt, sand and gravel carried by the streams from the melting ice filled the stream valleys. As a result of this filling the Mississippi bottom lands are over 150 feet above the rock floor of the valley. On the eastern edge of the state the glacial lakes left large flat areas of clay deposits which make rich level farm lands and valuable brick clays.

"The borders of the ice sheets (shown on the model by a dashed line are in many cases marked by knob and kettle ridges called moraines. There are long, low hills, called drumlins, in Dane, Dodge, Columbia, Jefferson and Fond du Lac counties. Their longer dimensions correspond with the direction of movement of the glacier which formed them.

INFLUENCE OF THE TOPOGRAPHY.

"The influence of the topography upon the history and economic development of the state is worthy of attention. The old water routes like the Fox-Wisconsin, are to be seen, also the features influencing the location of cities, railroads, and the industries dependent on water power. The influence of the topography and soil on agricultural conditions as well as on the relative development of different parts of the state is easily seen."

Report on General Geology of the State. In the last biennial report it was mentioned that plans had been made for a bulletin giving a general statement of the present knowledge of

the geology of Wisconsin. This bulletin will be written in non-technical language so that it might be useful to high school students and to the ordinary reader. Owing to the pressure of other work it has been impossible to get this work done, but it is hoped that it will be possible to send it to the press some time during the year.

HIGHWAYS.

G. *Highway Division.* From the end of the period covered by the last biennial report until June 30, 1909, the work of the highway division was continued under Chapter 641 of the laws of 1907. The legislature of 1909 passed a new law (Chapter 458) continuing the work of this division for a second biennial period.

At the general election of 1908, Section 10, Article 8 of the state constitution was amended so as to permit the state hereafter to give aid to towns and counties in building highways. This amendment was passed by a majority of nearly three to one and exceptionally large vote was registered. This result was largely due to the great amount of educational work accomplished by the highway division and the State Good Roads Association organized by Mr. Hotchkiss.

After the passage of this amendment, at the request of some of the members of the legislature, Mr. Hotchkiss undertook a very thorough study of the laws providing for state aid in other states and drafted a bill providing for state aid in Wisconsin. This bill was submitted to various members of the legislature and to other state highway departments for criticisms and suggestions, and after being revised in accordance with these was introduced by the Senate committee on roads and bridges. Owing to various circumstances, the legislature decided not to take any action with regard to state aid for roads, and appointed a special committee to consider the matter and make a report which would be acted upon at a special session which it was proposed to hold.

This committee met in September, 1909, and organized. They decided that the best means of finding out the needs of the state would be to hold public hearings in various sections of the state. At the invitation of the committee Mr. Hotchkiss accompanied

them on their trip and attended the hearings. After these hearings were completed, the committee delegated two of their members to draw up a bill and prepare a report. When this work was done, the committee were divided as to its merits, the majority signing it, however. It is the opinion of the highway division that this bill drawn up by the committee is exceedingly complex a ndill advised in many ways. A shorter and much simpler bill can be drawn to cover the same ground. In the latter part of the report recommendations as to highway legislation are given.

Since the last biennial report, the work of the highway division has been carried on under the direction of Mr. W. O. Hotchkiss as chief, with Mr. A. R. Hirst as highway engineer, Mr. M. W. Torkelson as bridge engineer and Mr. H. J. Kuelling as assistant engineer. The work accomplished is most easily described under the three headings used in my last biennial report:

1. Road Work.
2. Bridge Work.
3. Educational Work.

ROAD WORK.

Owing to the rapidly increasing interest in the building of better roads throughout the state, the assistance of the highway division has been demanded by many more localities than could be served. It was not possible within the limits of the appropriation to provide men enough to give the assistance which the local people needed and asked from the State. The work of this division has extended in one form or another into every county of the state except Vilas. As the work is all done upon the request of the local people, it is quite apparent that the demand for this assistance has been quite uniformly distributed over the whole state. The roads constructed under the direction of the highway division have called for the expenditure of about $136,000 on the part of towns and counties.

The road work has consisted of inspecting roads which towns desired to improve and give general advice upon the work which the towns afterward were to carry out. Over 114 roads in 32 counties have been thus inspected. In many cases it has been necessary to make surveys and plan the road and make detailed

estimates of its cost. Such plans have been made for cutting down hills and filling hollows and bringing the grade of the road more nearly to what it should be. Ninety such road surveys in 22 counties have been completed, and many more applications are waiting their turn.

The arrangement mentioned in the last biennial report according to which the highway division has had the use of steam rollers and stone crushers has been continued. This machinery has been of great value to the state. It has enabled the people to see the value of modern road machinery as the means of road construction and many counties have purchased machinery of their own. This state road machinery has been used in 13 counties in the construction of 24 different roads. The list of the counties where it has been used includes Ashland, Columbia, Grant, Jefferson, Kenosha, La Crosse, Milwaukee, Monroe, Portage, Rock, Rusk, Sauk and Waukesha. There were a great many more applications for the use of this machinery than it was possible to grant, in spite of the fact that the machinery is loaned under what might be considered unfavorable circumstances. The funds at the disposal of the highway division made it necessary for the town using the machinery to pay for the freight and all the expenses of operation.

In connection with the road work a great amount of data has been collected from town clerks and other local officials with regard to the local roads. These data have been embodied in a new geological and road map of the state now in the hands of the engraver. This map is described on page 15.

BRIDGE WORK.

One of the most widely appreciated branches of work in the highway division has been the assistance which it has offered to towns and counties in their bridge work. Before the highway division took up this work, the county and town bridge committees had no engineering assistance whatever in letting their contracts. When they notified bridge companies that there would be a letting on a certain day, every bridge agent who appeared had different plans to present and different prices. As a result of this system it was impossible for the officials to determine which was the best bridge for the money and the one most suited to their needs. When the assistance of the highway divi-

sion is requested, an engineer is sent to visit the bridge site, make proper inspections and obtain all data nacessary for making plans and a very careful estimate of the cost of the bridge. The data for letting the contract is agreed upon and the highway division thereupon notifies all bridge companies doing business in the state as to the kind and location of the bridge to be let, and if they desire to bid, furnishes them with copy of plans of the bridge and specifications under which it is to be erected. In this way all bids are on the same structure, one which is designed properly to fit local needs, so that in letting the contract the only thing that need be considered is the price. This assistance has been very highly appreciated by a large number of town chairmen. There have been 277 bridge inspections made upon requests which have come from all but seven counties in the state. The total cost of the bridges, the contracts for which we have assisted in letting, has been approximately $175,000. Many other bridges have been designed and plans sent directly to the town boards who have let their contracts; and a great many plans for concrete culverts have also been distributed, but there is no record of the number of times which these plans have been used. One town alone has built nearly 40 culverts and small bridges of concrete on the plans of this division.

The improvement which the bridge work of the highway division has been able to effect in the quality of highway bridges throughout the state is very noticeable. The usual remark made by the county committee or the town chairman when they have completed a bridge planned by this division is that they "have the best bridge in the county at the lowest price." Sometime ago a statement of the amount saved to their several towns was compiled from estimates given in letters from various town chairmen writing on this matter. These letters tell that on the 16 bridges to which they relate the total saving was estimated by the town chairmen at $7,500. The saving on the whole 277 bridges cannot be estimated. The appreciation of the town chairmen of this saving is perhaps best illustrated by the two following extracts from letters received by the division.

Barron, Wis., Jan. 16, 1909.

"I regard the Bridge Department of the State Highway Division almost of an inestimable value to town and county officials

in aiding them to buy better bridges at less cost and the satisfaction of knowing that they will not be skinned. The bridge letting of the new Hewitt bridge is perhaps the first letting in Barron county where a contract was entered into binding on both parties. Heretofore the usual practice has been to bind the town and county board only.

"The plans furnished us by your department saved the town of Chetek $575 on abutments on the Whitman bridge last year.

"When we were contemplating building the new Hewitt bridge I asked for estimates of cost from the various bridge companies and the cost varied from $5,800 to $7,500. We appropriated $5,400. Under the direction of the state highway division we proceeded to do some of the work ourselves by building the pier and abutments at a cost of about $1,100 as against $3,200 asked by bridge companies. On the whole job it is safe to say that the towns of Chetek and Dover have been saved $1,500 by asking the aid of the Highway Division, and especially the untiring efforts of Mr. Torkelson, the Bridge Engineer."

(Signed) J. A. H. Johnson.

Graytown, Wis., Dec. 12, 1908.

"We are satisfied that on the Allen Bridge which was built entirely on your plans and the contract let by your directions the town saved four or five hundred dollars at least. We also used your plans in building the abutments to the bridge we built on the county line between this town and the town of Vance Creek. It made a very neat and substantial job. With your help we have been able to do business with the bridge companies in an intelligent manner. Heretofore we have been obliged to take their word for about everything, including design, construction and price."

(Signed) C. B. Thatcher.

EDUCATIONAL WORK.

As stated in the last biennial report, it has been recognized by the highway division that the most important part of the work in the beginning was to arouse people to an interest in road building. There are nearly three million dollars a year being spent on roads and bridges in the state at the present time. If this money could be properly spent there would be

no need for any outside assistance to secure good roads. The difficulty comes from the fact that the money is all spent under the direction of men who have had little or no experience in the economical building and maintaining of roads and bridges, and so about fifty per cent of it is wasted.

Many newspaper articles on good roads have been sent out and the press of the state has assisted by showing great interest in this matter. Good road talks have been given at farmers' institutes, business men's clubs, various state conventions, etc. In all, 257 such talks have been given in 63 counties. The supply of the four road pamphlets described in the last biennial report became exhausted and it was necessary to get out a new edition. These pamphlets have been exceedingly popular because of the simple, practical directions for road and culvert building which they contain.

The correspondence course in road building given in connection with the Extension Department of the University has been continued.

The result of all this educational work has been a greatly increased interest in road building and a marked improvement in local methods, the value of which cannot be estimated in dollars and cents, but which is very evident to one who has given attention to the condition of the roads in the last few years.

SOIL SURVEY, IN CHARGE OF PROFESSOR WHITSON.

H. *Division of soils.* The soils constitute by far the greatest single natural resource of the state, since they are the source of all agricultural products. A knowledge of their nature and of the distribution of the different varieties lies at the basis of their intelligent use. At present we have only a very imperfect and general knowledge of the soils. A very general map of the soils of the state was prepared by Professor Chamberlin in connection with the first complete geological survey of the state. In connection with the survey of the areal geology, the present Geological and Natural History Survey has prepared a preliminary survey of the soils of a portion of the newer part of the state, approximately 14,000 square miles in area.

Realizing the necessity of a much more complete survey of the soils of the state than the appropriation for this survey has heretofore made possible, the legislature of 1909 made an ap-

propriation to the Survey of $10,000 annually for two years to start the work of such a survey, which, it is expected, will require a period of approximately ten years to complete. The statute establishing the survey directed that the work be done in cooperation with the College of Agriculture of the State University. This cooperation has been effected; Dean Russell is consulted regarding all parts of the work; the college provides quarters for the laboratory work of the survey; and the immediate direction of the work is in charge of Professor A. R. Whitson of the College of Agriculture.

Cooperation from the Bureau of Soils of the United States Department of Agriculture has also been secured, by which the extent and efficiency of the work of the Survey is greatly extended. The Bureau of Soils places in the field the same number of men as this Survey and bears half the expenses of field parties. Arrangements for publication of results have also been made with the Bureau of Soils. Professor Whitson is placed in charge of all the work on soils, whether done by the State or the Department of Agriculture.

The plans proposed at the time of the making of this appropriation, included a detailed survey of the older portions of the state and a preliminary survey of the remainder of the newer portions not already surveyed in connection with the areal geology.

The work of the detailed survey was begun July 10, 1909, in Iowa, Waukesha and Waushara counties and an area bordering on Chequamegon Bay and the Apostle Islands. Work had been undertaken on the last mentioned area by the Bureau of Soils prior to arrangements of cooperation at the request of persons interested in fruit raising in that section. During the summer of 1909, the field work on the Bayfield and Waukesha areas was completed and in the spring of 1910, work was begun in Juneau and Fond du Lac counties and that in Waukesha and Iowa continued. During the first year, a detailed survey has been made of approximately 2,175 square miles. In this detailed work, the soils are mapped on a scale of one inch to the mile and areas as small as ten acres in extent are shown. The soils are classified into types and series as determined by agricultural conditions, such as texture, topography, drainage and by mode of origin.

This field work has been done by Messrs. T. J. Dunnewald, Arthur Kuhlman, A. H. Meyer, L. R. Schoenmann and O. E. Baker.

Chemical analyses are being made of representative samples of all types mapped. These analyses will show: total nitrogen, phosphorus and potassium; phosphorus soluble in N/5 nitric acid, carbon dioxide in carbonates, total organic matter and degree of acidity. The chemical laboratory of the soils survey has been under the charge of Prof. C. W. Stoddart, who has devoted approximately one-third of his time to this work. He has been assisted by Miss Louise Jahns, Mr. Guy Conrey, Mr. F. L. Musback and Mr. E. B. Spraker.

The reconnaisance work was begun in Marinette county about the middle of July, 1909, and that area, of approximately 1,400 square miles, was completed during the fall. The field work in this area was under the immediate charge of Dr. S. Weidmann in connection with the survey of the areal geology of that county.

Owing to the unsettled condition of the newer portion of the state, it was found necessary to organize a camping party in order to make the preliminary survey of this county as planned. It has proved more expensive to conduct the preliminary survey under such conditions, where the lines of traverse follow section lines, than to make the detailed survey in the more settled portions of the state. It was deemed best, therefore, to abandon this plan for the preliminary survey in future, and to survey the remainder of the northern part of the state in less detail, using such roads as are accessible without camping parties. During the season of 1909, the preliminary survey of the soils of the area previously begun in the northwest central part of the state was revised by Dr. Weidmann with the assistance of Mr. F. L. Musback.

Reports on all of these areas are now in progress of preparation and will contain a general statement of the climate and agriculture of these areas; full description of the types of soils as mapped; the chemical analyses; and tentative suggestions in regard to special treatments which the soils require in order to yield the best results to the farmer. These reports will be prepared by the state organization in cooperation with the Bureau of Soils of the United States Department of Agriculture.

It is expected that a final report on the soils of the state, including a more complete discussion of their agricultural use will be made at the close of the work of the survey of the entire state.

The great value of this survey of the soils of the state is already manifest. A number of areas have been found which require special treatment to enable them to produce the largest crops which they are capable of yielding.

I. *Work of the present season.* 1. *Geology Division.* The work under immediate direction of Mr. Hotchkiss will consist in writing the general report on geology and of three new lines of work. Arrangements have been made with Professor Whitbeck of the State University to take up the study of the geography and industries of the state and write a report which will be issued as one of the educational series of bulletins. This report will be a valuable text and reference book for use in the schools of the state.

Another line of work for the present season is a study of the Lake Superior Sandstone. This will be a scientific study taken up for the purpose of correlating this sandstone with the sandstones of the central part of the state.

Mr. Hotchkiss personally will lead a party in Florence County making a study of the iron district in the northeastern part of the state. No work in this district has been done by any geological survey since that done under Major Brooks of the former state survey in 1875. A great amount of development has taken place since that time and mining men are taking an active interest in the district at the present time. Owing to the importance of this work, it has been possible to arrange with the United States Geological Survey to have them undertake the making of topographic maps of the district so that the geology may be published on a topographic base map. The United States Geological Survey will probably expend more than $10,000 in making these maps.

Dr. Weidman will give his time to completing his report on the Northwestern Area; the first part will consist of the report on soils, which will soon be finished.

2. *Natural History Division.* The report on lake gases and biology is in the press and the first work is to attend to issuing this bulletin. Not very much field work will be done this sum-

mer. A party at Waupaca is carrying on observations on the lakes of that place, in order to finish certain details for the report. Some field work preliminary to new studies will be done. The Director and Mr. Juday expect to spend some time on the lakes of central New York, under the auspices of the U. S. Bureau of Fisheries, extending to the deeper lakes of that region the studies made on Wisconsin lakes.

No work will be done to extend the collection of fishes as the Survey has now no room in which to store any additional material.

3. *Highway Division.* The work of this division is proceeding along the lines established in the past and indicated in this report. All of the funds granted by Chap. 458 of the laws of 1909 will be needed for highways and nothing can be spent on water powers of the lead and zinc region.

4. *Division of Soils.* The field work of this division is progressing rapidly. La Crosse county will be taken up after the completion of Iowa county. The detailed surveys of Juneau, Waukesha and Fond du Lac counties will be completed, and reconnoissance surveys are being made in Bayfield county and in the region of the Forest Reserve. In the last, work is done in cooperation with the State Board of Forestry.

The exact areas which will be covered by the different parties can not be accurately stated at present, but they will be considerably larger than last year.

Reports on areas surveyed last year will be completed and turned over to the U. S. Bureau of Soils for publication.

IV. PUBLICATIONS.

The Survey has issued less during the biennial period than in any previous one. The only publication has been the supplementary atlas of maps of additional areas in the lead and zinc district. These cover 89 square miles and were fully described in the Sixth Report. Besides these there have been reprinted Bulletin No. XI on the soils of northwestern Wisconsin by Dr. Weidman and the four Road Pamphlets by Mr. Hirst.

There are now in the press and about ready to issue (1) a new and revised edition of Bulletin No. VIII. The Lakes of Southeastern Wisconsin, by N. M. Fenneman. (2) Bulletin No. XXI.

Scientific Series No. 6. The fossils and Stratigraphy of the Middle Devonic of Wisconsin, by Herdman F. Cleland. There is in the press Bulletin No. XXII, Scientific Series No. 7. The The Inland Lakes of Wisconsin; the Chemistry and Biological Relations of the Dissolved Gases, by E. A. Birge and Chancey Juday.

In the hands of the engravers are the following maps: (1) The maps for the soil report and geology of Northwestern Wisconsin. (2) The general geological map of the state.

The U. S. Bureau of Soils is issuing the map and report of joint work on the area in Bayfield county. The Survey has transmitted to this Bureau, for similar issue, the report on the soils of Marinette county.

The following reports are nearly ready for the printer: (1) A report on the underground and other waters used as a source of domestic supply in Wisconsin, by A. R. Schulz, revised by S. Weidman. (2) A report on the Peat Resources of the state, by F. W. Huels.

V. FUTURE WORK OF THE SURVEY.

During the past two years the Survey has begun one most important piece of new work. This is the Soil Survey whose establishment was authorized by the legislature of 1909 and $10,000 annually for two years was appropriated to begin the investigation. This will doubtless be continued and this most necessary survey pushed on to completion. In other lines the Survey has done little except carry on work already begun. As has always been the case, most of the money has been spent on geology and allied subjects and little on natural history. The fund of $10,000 annually, granted by the legislature of 1907 and extended for two years more by that of 1909, has been practically all expended on highways. A small amount of most needful work was done on Southwestern Wisconsin but no general survey of the lead and zinc district has been undertaken. Practically nothing has been done on the water power survey which was also authorized by the legislatures of 1907 and 1909, as the whole of the money granted by the laws, has been imperatively demanded for highways. As this report shows, several comparatively small pieces of work have been accomplished but the larger projects have had to be postponed. With

the passage of a state highway law the funds of Survey will be relieved of the care of this part of the work; and if the legislature will continue the appropriations already made to the Survey these larger and very important matters can be taken up and completed.

I repeat, therefore, from the Sixth Biennial Report certain paragraphs which refer to these investigations:

"1. *Water Powers.* The water powers of the state require much more study. Many of the larger rivers are still unsurveyed. Of these may be mentioned the St. Croix, the Upper Chippewa, the Upper Wisconsin, the Wolf, Oconto, Menomonee, White, Bad, Trempealeau, and the La Crosse Rivers. Those rivers which have been surveyed need much more study. Just at the present time there is a pressing demand from the national government and from legislative committees for information regarding the water powers. No such data are at hand as are necessary for the information asked. Knowledge of the water powers is required in a completeness and detail which can be supplied only by years of work devoted to stream surveys and gaugings. There can be no doubt that the knowledge thus sought is not only valuable but necessary. Many of the facts now asked for could be given had the Legislature thought it wise to give money enough to permit the rapid carrying on of this branch of the Survey.

"2. *Southwestern Wisconsin.* The lead and zinc district needs much more study. The Survey has made topographical and geological maps of the more important regions where mining is now carried on. These scattered areas should be connected, and a map of the entire district should be published. Several years of field work will be necessary to complete this. This work should be done in advance of exploration, to serve as a guide for the drill men in their search for ore. It should not be necessary for them to spend thousands of dollars in looking for ore in places where there was practically no chance of finding it. The Survey has been able to do very little thus far in the study of the ores and of their origin, and of the manner of their deposition. It cannot be doubted that such study would lead to scientific results of much value, and also yield, as such work is sure to do, knowledge of great practical importance to prospectors, being helpful to them in developing new districts.

3. *Topography.* "In my last biennial report I referred to the necessity of beginning work on the preparation of a topographical map of the state and shall make only brief reference to the matter at this place. The preparation of such a map is one of the duties committed to the Survey by the original law which created it; yet nothing has been done by the State in this direction, since pressing necessities of other branches of investigation gave them precedence. The United States Geological Survey has issued topographical maps covering the southern portion of the state, about as far north as Milwaukee, but this survey is no longer being extended, nor is there reason to believe that much will be done until the State is ready to cooperate with the National Government in the work."

The need for topographic maps of the state such as are prepared by the United States Geological Survey is becoming more and more urgent. These maps are needed as a basis for a great deal of work which the state must do in the near future. A topographic map is almost a necessity as a basis for soil maps and geological maps. They are much needed in connection with the state forest reserves, and they give a great deal of information that will be valuable to the state in its road building.

These maps are also valuable in that they show the existence of water powers and the area of drainage basins tributary to these powers. The State Water Commission of New York uses them as a basis from which to compute the capacity of storage reservoir sites. They also furnish a basis for swamp land drainage, which is becoming of great importance in this state. These maps are also of much use for educational and other purposes. The United States Geological Survey has made a practice for some years of cooperating with states that appropriate money for the making of such topographic maps. They have a trained force of topographers and do an exceedingly high grade of work. It is highly desirable that a special continuing appropriation be made for the purpose of extending this topographic mapping as rapidly as possible.

4. *Educational Bulletins.* The preparation of educational bulletins is a branch of the work which the Survey was directed to undertake, but to which it has been able to devote but little money. Two or, perhaps three, such bulletins have been issued, all of which have been very successful. Those on Devil's Lake

and on the lakes of the southeastern part of the State are now out of print, but the Survey has now in hand the manuscript for a second edition of the last named. Work has been started on a bulletin giving an account of the general geology of the State. This should be pushed to completion, and in addition the Survey ought to be able to extend its work so as to make a complete report upon the physical geography of Wisconsin. Few states of the Union, perhaps, offer larger opportunities for an instructive report on this subject, and the interests of education as well as of science would be greatly advanced by its preparation.

Two bulletins of this nature, one on the geology of the state and one on its geography and manufactures are in preparation and will probably be ready for the press during the coming year.

5. Besides these subjects of special importance, there are the subjects on which study has been going on for some years. These are the geology of the Northwestern Area by Dr. Weidman; the study of the lakes by the Director and Mr. Juday; and the report on fish by Mr. Wagner. These will require in the next two years about the same sums as in the past, but it should also be possible to appoint an assistant who could give his whole time to the preparation of a report on the fish of the state, especially those of the inland waters, dealing with their nature, their distribution, their habits, and their food. This would require several years, but it is important, and fully justifies the time expended upon it.

6. *Highways.* The most important recommendations which I have to offer concern the policy of the State with regard to giving state aid for road building. That there is an overwhelming public sentiment in favor of adopting such a policy, was shown by the large majority given to the amendment to the constitution to make this possible, and the same sentiment was found by the special committee of the legislature of 1909 in their hearings throughout the state.

The most important thing in adopting such a policy is to provide for the efficient spending of the state funds. As stated in the report of the work of the highway division, there is enough money already being spent every year in the state to build good roads if it were spent efficiently. The most important function of state aid in this matter accordingly, will be to insure that the local money spent in conjunction with state aid shall be

used in the most efficient manner possible. This can only be accomplished by putting the administration of these funds under the supervision of the best trained road builders that can be secured.

A careful study of the laws of other states has been made and the results obtained under these laws have been learned in many cases by personal consultation with the state officials in charge. From this study it appears that the best results are to be secured by putting the work in charge of a board or commission, serving without pay and working through a chief engineer and assistants whom they appoint. Such commissions are in charge of the work in many states and are giving the best of satisfaction. They meet several times a year and give personal directions for the work of their employes in the same manner as a number of boards which we have at present in this state, viz. the Board of Commissioners of this Survey, the Fish Commission, the Capitol Commission. and the Boards of Regents of the Normal Schools and of the University.

In beginning this policy of state aid for roads, it appears that the work could be started most efficiently under the direction of the Geological and Natural History Survey. This organization is more thoroughly in touch with the situation and needs of the state through the four years' work of the highway division than any new commission could be. The work could be started with least expense and difficulty by simply enlarging the duties and authority of this division. The necessary force of experienced engineers will be difficult to obtain. If the highway division were put in charge, new inexperienced men could be worked in under the direction of the thoroughly experienced men already employed. A newly made commission would not be familiar with conditions and would not be able to start the work as quickly and efficiently.

Whether the work be done under the direction of this Survey or whether a new commission be formed, there are certain things which should be embodied in the law establishing a state highway department. It should be recognized that this work is technical in its nature and the active work should be in charge of properly trained and experienced men. In order to obtain and hold such men it is necessary that their tenure of office should be for the period of efficient service and should not

be subject in any way to considerations of politics. The state highway department should be given ample authority to insure the efficient spending of state money. It will not be necessary to have a great force of engineers employed by the state if the plans are carefully made. Such of the work as can be done more cheaply by local people can be delegated to them, and in this way a moderate sized force in the employ of the state will be able to give the work proper supervision.

Other matters, such as the details of the distribution of funds, and constructing and maintaining the roads, etc., have been carefully considered and the Survey will be ready to counsel at the proper time with the committees of the legislature having the matter under consideration, if such counsel is desired. The most important considerations which I wish to emphasize at this time are the importance of getting a non-political unsalaried commission with experienced engineers in their employ, and giving them all needed authority to insure the efficient spending of state funds.

7. *The Soil Survey.* Little need be said as to the future needs of this division. The legislature will no doubt continue the appropriation made two years ago, and with the aid of the U. S. Bureau of Soils, the survey can be prosecuted at a sufficiently rapid rate. It is already evident that the ten years, stated to the legislature as the time necessary for the completion of the first survey of the soils, will be needed. The older parts of the state demand a more detailed treatment than was at first thought necessary. The assistance and cooperation of the Department of Agriculture, however, enables the Survey to cover with its field parties as large an area as was planned at first.

FINANCIAL REPORT.

(EXTRACTED FROM THE REPORT OF THE SECRETARY OF STATE)

DISBURSEMENTS, JULY 1, 1908–JUNE 30, 1909.

Birge, F. A., director, salary and expenses	$617 56	
Buetow, W. C., draughtsman	411 69	
Balsey, F. M., services	114 08	
Bates, F. E., services	23 10	
Cox, G. H., geologist	500 00	
Colladay, E. B., services	50 30	
Cenfield, F. H., services	51 45	
Christopher, R. T., services	53 33	
Diemer, M. E., services	57 36	
Deming, R. E., services	7 80	
Fisher, S. M., services	17 70	
Glaettli, John, services	28 25	
Gilman, E. D., services	22 95	
Gleason, M. G., services	5 50	
Hotchkiss, W. O., geologist, salary and expenses	2,962 49	
Hall, E. B., assistant, salary and expenses	805 54	
Hirst, A. R., engineer, salary and expenses	2,785 78	
Halbert, C. A., services	15 81	
Huels, F. W., assistant, salary and expenses	367 97	
Hall, R. D., services	97 17	
Jackson, H. H. T., services	273 44	
Juday, Chancey, biologist, salary and expenses	1,160 18	
Kuelling, H. J., assistant, salary and expenses	1,246 13	
Kleinheinz, Adelaide, services	10 25	
Kemmerer, George, services	69 09	
Lenher, Victor, services	10 00	
Le Grand, A. J., services	98 32	
Lorenz, E. H. J., services	12 00	
Martin, Laurence, service	727 00	
Maxon, J. G., services	49 40	
Moore, A. L., services	15 00	
Mott, W. R., services	18 00	
Marshall, Ruth, services	75 00	
Richardson, W. D., services	28 00	
Rigden, E. J., services	29 00	
Smith, L. M., services	80 00	
Sanford, F. G., clerk	275 00	
Torkelson, M. W., engineer, salary and expenses	2,124 59	
Thwaites, F. T., assistant, salary and expenses	710 75	
Tomlinson, W. H., services	32 97	
Vorhies, C. T., services	100 90	
Weidman, S., geologist, salary and expenses	2,202 52	
Wagner, George, services	36 23	
Wells, W. C., stenographer	630 00	
American Express Co., expressage	285 00	
Bausch & Lomb Optical Co., supplies	7 50	

Cantwell Printing Co., supplies	25 00	
Carpenter, G. B., & Co., supplies	54 60	
Dietzgen, Eugene, Co., supplies	79 06	
Democrat Printing Co., printing	2,694 09	
Eastman, J. S., supplies	2 15	
Fass, Joseph & Co., supplies	30 50	
Findorff, J. H., supplies	9 00	
Gebhardt, Carl, supplies	3 00	
Hoen, A., & Co., maps	1,767 00	
Haswell Furniture Co., supplies	84 75	
Hollister Drug Co., supplies	12 30	
Haak, William, Jr., supplies	28 84	
Keuffel & Esser Co., supplies	4 48	
Kemmerer, George, photographs	64 00	
Lutman, B. F., supplies	9 80	
Madison Tent & Awning Co., supplies	6 50	
Madison Engraving Co., cuts	1 03	
North Western Lithographing Co., maps	261 17	
National Distilling Co., supplies	29 17	
Oshkosh Gas Light Co., supplies	90 00	
Parsons Printing & Stationery Co., supplies	87 60	
Polk, R. L., & Co., book	6 00	
Smithsonian Institution, exchanges	68 70	
Sargent, E. H., & Co., supplies	42 77	
Streissguth-Petran Engraving Co., cuts, etc	30 05	
United States Express Co., expressage	169 18	
University Co-operative Co., supplies	19 68	
Whitall-Tatum Co., supplies	53 20	
Wolf, Kubly & Hirsig, supplies	12 70	
Wisconsin Central Ry. Co., freight	16 24	
Wells, Fargo & Co., expressage	2 71	
		$24,997 37

DISBURSEMENTS, JULY 1, 1909–JUNE 30, 1910.

Allen, Thomas, compassman	$112 00	
Birge, E. A., director, salary and expenses	791 59	
Balsey, F. M., services	83 18	
Brightman, Herbert, teamster	48 67	
Besaw, George, cook	32 50	
Brewer, B. C., stenographer	82 00	
Baker, O. E., assistant	118 43	
Barnes, R. A., services	75 00	
Colladay, E. B., services	150 95	
Christopher, R. T., services	246 66	
Cenfield, F. H., services	17 10	
Charron, Paul, cook	49 73	
Conrey, Guy, chemist	617 70	
Crampton, B. L., services	8 10	
Dunnewald, T. J., assistant	501 96	
Dudgeon, S. B., assistant	137 00	
Davis, J. B., services	10 00	
Evans, W. J., services	19 29	
Gray, James, compassman	27 00	
Glaettli, A., Jr., services	4 20	
Graul, E. J., analyst	50 00	
Hotchkiss, W. O., geologist, salary and expenses	3,955 53	
Hirst, A. R., engineer, salary and expenses	2,932 03	
Hall, E. B., geologist, salary and expenses	259 99	
Huels, F. W., special assistant, salary and expenses	810 52	
Hall, S. P., services	99 30	
Havard, F. T., services	7 00	
Juday, Chancey, geologist, salary and expenses	1,719 41	
Jones, E. R., expert	148 63	
Johns, Louise, analyst	529 18	
Kuelling, H. J., assistant engineer, salary and expenses	1,789 17	
Kuhlman, A. H., assistant	301 30	
Kemmerer, George, services	38 10	
Le Grand, A. J., services	175 05	
Lorenz, E. H. J., work on model	787 43	
Lynes, George, compassman	83 61	
Lorenz Model Co., services	63 35	
Leutzinger W. A., services	15 25	
Langwell, J. S., services	1 30	
Musback, F. L., assayist, salary and expenses	1,503 53	
Mitchell, W. R., services	29 16	
Meyer, A. H., assistant	444 45	
Nebel, Walter, assistant	5 75	
Nelson, Oran, services	1 00	
Nourse, S. D., labor	17 00	
Pickering, H. G., services	20 85	
Peltier, G. L., labor	62 80	
Quan, C. E., stenographer	12 95	
Rigden, E. J., services	41 00	
Sanford, F. G., clerk	325 00	
Stoddart, C. W., chemist	743 95	
Schoenmann, L. R., assistant, salary and expenses	497 10	
Spraker, E. B., assistant, salary and expenses	624 00	
Smith, A. J., services	8 00	
Torkelson, M. W., engineer, salary and expenses	2,620 02	
Thwaites, F. T., assistant geologist, salary and expenses	770 00	
Truog, Emil, assistant	175 00	
Toole, E. H., services	58 30	
Wells, W. C., stenographer	664 53	
Wells, W. C., Estate of, salary	34 00	
Weidman, S., geologist, salary and expenses	3,065 31	
Walster, H. L., assistant	126 02	
Ward, O. G., draftsman	50 05	
Whitson, A. R., services	185 76	
American Express Co., expressage	171 32	
Ashley, H. E., expenses	39 00	

Bishop, J., & Co., supplies	321 40	
Baker, J. T., Chemical Co., supplies	71 38	
Bleininger, A. V., expenses	38 40	
Cantwell Printing Co., supplies	59 25	
Carpenter, G. B., Co., supplies	44 00	
Curtiss, F. W., prints	46 25	
Democrat Printing Co., printing	151 15	
Dietzgen, Eugene, Co., supplies	108 26	
Dyke, L. G., expenses	10 99	
Estes, R. L., Agent, typewriter rent	1 50	
Fass, Joseph, & Co., supplies	5 25	
Gould, Wells & Blackburn Co., supplies	15 00	
Grimm's Book Bindery, supplies	46 16	
Gallagher, John, Co., supplies	15 00	
Gurley, W. & L. E., supplies	106 16	
Haswell Furniture Co., supplies	117 85	
Hoen, A. & Co., cuts	165 00	
Haak, William, Jr., supplies	16 00	
Illinois Electric Co., supplies	14 00	
Indiana Road Machine Co., machine	81 50	
Illinois Central R. R. Co., freight	4 65	
Kny, Scherer Co., instruments	54 00	
Kenoyn Printing & Mfg. Co., books	15 00	
Laun, Mangold & Co., supplies	30 58	
Mandel Engraving Co., cuts	3 30	
Madison Tent & Awning Co., supplies	6 75	
Mead, W. J., books	10 00	
Mautz Bros., supplies	10 27	
National Distilling Co., supplies	27 18	
Niedecken, H., Co., supplies	40 00	
Oscar, N. M., books	5 00	
Polk, R. L., & Co., directory	6 00	
Parsons Printing & Stationery Co., supplies	51 13	
Plantz, Samuel, expenses	5 74	
Post, L. M., repairs	9 80	
Streissguth-Petran Engraving Co., cuts	49 71	
Sargent, E. H., & Co., supplies	276 57	
Smith's Livery, livery	12 25	
Smithsonian Institution, exchanges	31 45	
Torison Balance Co., supplies	35 00	
Veeder & Veeder, books	5 00	
University Co-operative Co., supplies	2 30	
Wells, Fargo & Co., expressage	74 19	
Whitall Tatum Co., supplies	45 72	
Wagner, George, expenses	32 80	
Wright Bros. Co., supplies	17 20	
Kenyon Printing & Mfg. Co., books	15 00	
West, H. H., Co., supplies	10 00	
		$31,563 28

STATUTES OF WISCONSIN RELATING TO THE GEOLOGICAL AND NATURAL HISTORY SURVEY.

CHAPTER 297, LAWS OF 1897.

An Act to provide for the investigation of the natural resources of the state of Wisconsin, and providing an appropriation therefor.

The people of the state of Wisconsin, represented in senate and assembly, do enact as follows:

SECTION 1. There is hereby constituted a geological and natural history survey of the state of Wisconsin.

SECTION 2. This survey shall have for its object:

(1) The completion of the geological survey of the state, and especially the examination of the rocks, with reference to the occurrence of iron ores, building stones, and other valuable mineral products, and in reference to their value as material for road construction.

(2) A study of the soils of the state.

(3) A study of the plants of the state, and especially of the forests, with reference to their cultivation and preservation.

(4) A study of the animal life of the state, and especially the occurrence, distribution and production of fish in the lakes and streams of the state, and a study of foods and enemies of fish.

(5) The preparation of an account of the physical geography and natural history of the state, in such form as to serve as manuals for the public schools, and of special reports on subjects of economic importance, in such form as to be of direct service to the people.

(6) The completion of the topographic map of the state begun by the United States Geological Survey; but no money shall be expended for topography unless an equivalent amount be expended for this purpose in the state by the United States government.

SECTION 3. This survey shall be governed by a board of commissioners, consisting of the governor of the state, the state superintendent of public instruction, the president of the state university, the president of the commissioners of fisheries, and the president of the Wisconsin academy of sciences, arts, and letters. The commissioners shall meet within thirty days after the passage of this act, and organize as a commission and adopt by-laws fo rtheir government, not inconsistent with law, and shall meet at such time and places as they may prescribe. A majority shall be a quorum. They shall receive no compensation, but each shall be reimbursed his expenses actually and necessarily incurred in the performance of his official duties, out of such appropriation as may be made by the legislature. They shall choose from their number a president, secretary, and such

other officers as their by-laws may prescribe; but no officer shall receive any compensation, except such as is herein provided for. The commissioners shall have general charge of the survey, and shall appoint a superintendent of the survey, and, on his nomination, such assistants and employes as they may deem necessary. They shall fix the compensation of all persons employed in the survey, and may remove them at pleasure.

SECTION 4. It shall be the duty of the commissioners to prepare a report before the meeting of each legislature, showing the progress and condition of the survey, giving an account of money spent together with such other information as may be deemed necessary and useful. The superintendent shall transmit to the commissioners, from time to time, special reports, with necessary illustrations and maps, as these are completed. If approved by the commissioners, they shall be transmitted to the commissioners of public printing, who are authorized to have the reports published in a suitable manner, as independent reports, as bulletins of the state university, or in the transactions of the Wisconsin academy of sciences, arts, and letters, as the commissioners of the survey deem best. If published as independent reports, it shall be the duty of the commissioners of public printing to decide as to the number of copies in the edition of each particular report. Five copies of each report shall be delivered to each of the state officers, and to each member of the legislature. The number of copies provided by law for other public documents shall be furnished to the state historical society, the library of the state university, and other state institutions. The remainder of the independent reports shall be distributed, used in exchange, or sold by the commissioners of the survey, as the interest of the state and of science demands. All moneys obtained by the sale of the report shall revert to the state treasury, as a part of the general fund. Volumes obtained in exchange for the reports shall be added to the library of the Wisconsin academy of sciences, arts, and letters. The superintendent of public property shall furnish, upon the requisition of the president of the commissioners of the survey, such stationery and postage stamps as may be necessary for the use of the commissioners and the superintendent of the survey in official business.

SECTION 5. After material collected shall have served for the purposes of the survey, it shall be distributed to the state university, the colleges of state, the state normal schools, and the free high schools of the state, under the approval of the commissioners of the survey, in such a manner as to be of the greatest advantage to education in the state.

SECTION 6. There is hereby annually appropriated for two years to the commissioners of the geological and natural history survey, out of any money in the treasury not otherwise appropriated, the sum of $5,000, the first appropriation to be paid in the current fiscal year.

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

Approved April 22, 1897.

CHAPTER 163, LAWS OF 1899.

An Act to appropriate a sum of money for the further prosecution of the geological and natural history survey of the state.

The people of the state of Wisconsin, represented in senate and assembly, do enact as follows:

SECTION 1. There is hereby appropriated for the further prosecution of the geological and natural history survey, out of any money in the

treasury not otherwise appropriated, the sum of ten thousand dollars annually for the term of two years. This money shall be expended by the commissioners of said survey for the purpose of executing the duties assigned to them by chapter 297 of the laws of 1897.

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

Approved April 12, 1899.

CHAPTER 375, LAWS OF 1901.

An Act to appropriate a sum of money for the further prosecution of the geological and natural history survey of the state.

The people of the state of Wisconsin, represented in senate and assembly, do enact as follows:

SECTION 1. There is hereby appropriated for the further prosecution of the geological and natural history survey, out of any money in the treasury not otherwise appropriated, the sum of five thousand dollars annually. This money shall be expended by the commissioners of said survey for the purpose of executing the duties assigned to them by chapter 297 of the laws of 1897, and any other duties which may be assigned to them by the legislature.

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

Approved May 13, 1901.

CHAPTER 176, LAWS OF 1903.

An Act to appropriate money for the further prosecution of the geological and natural history survey of the state.

The people of the state of Wisconsin, represented in senate and assembly, do enact as follows:

Appropriation of $5,000 additional. SECTION 1. There is hereby appropriated for the further prosecution of the geological and natural history survey of the state, out of any moneys in the treasury not otherwise appropriated, the sum of five thousand dollars annually, in addition to the sum now appropriated by law. This money shall be expended by the commissioners of said survey for the purpose of executing the duties assigned to them by chapter 297 of the laws of 1897, and any other duties which may be assigned to them by the legislature, and especially for the investigation of the clays and clay industries and the completion of the survey of the lead region.

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

Approved May 6, 1903.

CHAPTER 475, LAWS OF 1905.

An Act to provide for ascertaining the amount of available water power in this state and making an appropriation therefor.

The people of the state of Wisconsin, represented in senate and assembly, do enact as follows:

SECTION 1. The geological and natural history survey of the state of Wisconsin is directed to cause survey to be made of the water powers of the state for the purpose of ascertaining the amount of available water power in this state, developed and undeveloped, and the location of the same. Such work may be done in conjunction with the United States geological survey. Upon the completion of such

survey a full report thereof shall be made to the governor for the use of the legislature. The sum of two thousand five hundred dollars or so much thereof as may be necessary is hereby appropriated out of any money in the treasury not otherwise appropriated, to defray the expense of such survey.

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

Approved June 20, 1905.

CHAPTER 458, LAWS OF 1909.

An Act to amend section 392 1 of the statutes, relating to the geological and natural history survey, and making an appropriation therefor.

The people of the state of Wisconsin, represented in senate and assembly, do enact as follows:

SECTION 1. Section 392 1 of the statutes is amended to read: Section 293 1. 1. The geological and natural history survey is directed to investigate and to carry on such experimental work in road building, different methods of construction, kinds of material, and systems of drainage as will enable it to determine upon the various methods of road construction best adapted to the various sections and soils of the state, the cost of the same and recommend standards for the construction of highways in the various sections of the state. It may be consulted by county, city, village or township officers having charge over highways and bridges, and shall when requested advise and give without charge information to such officers relative to the construction, repairing, alteration and maintenance of said highways and bridges.

2. Local road authorities are required to furnish the Geological and Natural History Survey data as to the mileage, cost, maintenance, condition and character of roads under their supervision, upon the written request of and on blank forms supplied by said Geological and Natural History Survey.

3. Said Geological and Natural History Survey is further directed to extend the survey of the lead and zinc region beginning with districts which are at present of greatest economic importance.

4. Said Geological and Natural History Survey is further directed to continue the survey of the water powers of the state. This last survey may be made in conjunction with tne United States Geological Survey.

5. Upon completion of the work named, full reports shall be made to the governor for the use of the legislature. The sum of ten thousand dollars annually for two years is hereby appropriated to defray the expense of executing these duties or other duties assigned to the said survey by the legislature.

This chapter is a reenactment, without substantial change, of chap. 641, laws of 1907.

CHAPTER 403, LAWS OF 1909.

An Act to create section 392k—1 of the statutes, relating to a soil survey, and making appropriation therefor.

The people of the state of Wisconsin, represented in senate and assembly, do enact as follows:

SECTION 1. There is added to the statutes a new section to read: Section 392k—1. The geological and natural history survey of the

state of Wisconsin is directed to cause a soil survey and a soil map of the state to be made for the purpose of ascertaining the character and fertility of the developed and undeveloped soils of the state, the extent and practicability of drainage of swamp and wet lands of the state, and the means for properly conserving and increasing the fertility of the soil of the state, such work to be carried on in cooperation with the college of agriculture of the University of Wisconsin. The sum of ten thousand dollars annually for the biennial period ending June 30, 1911, is appropriated out of any money in the treasury not otherwise appropriated for the purpose of such survey.

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

Approved June 15, 1909.

PUBLICATIONS

OF THE

Wisconsin Geological and Natural History Survey.

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1. BULLETINS.

The publications of the Survey are issued as (1) bulletins, which are numbered consecutively, (2) road pamphlets, (3) biennial reports, and (4) hydrographic maps. These publications are independently paged and indexed, no attempt being made to group them in volumes.

1. BULLETINS.

The bulletins are issued in three series:

Scientific Series.—The bulletins so designated consist of original contributions to the geology and natural history of the state, which are of scientific interest rather than of economic importance.

Economic Series.—This series includes those bulletins whose interest is chiefly practical and economic.

Educational Series.—The bulletins of this series are primarily designed for use by teachers and in the schools.

The following bulletins have been issued.

Bulletin No. 1. Economic Series No. 1.

On the Forestry Conditions of Northern Wisconsin. Filibert Roth, Special Agent, United States Department of Agriculture. 1898. Pp. vi, 78; 1 map. *Out of print.*

Bulletin No. II. Scientific Series No. 1.

On the Instincts and Habits of the Solitary Wasps. George W. Peckham and Elizabeth G. Peckham. 1898. Pp. iv, 241; 14 plates, of which 2 are colored; 2 figures in the text. Sold at the price of $1.50 in paper and $2.00 bound.

Bulletin No. III. Scientific Series No. 2.

A Contribution to the Geology of the Pre-Cambrian Igneous Rocks of the Fox River Valley, Wisconsin. Samuel Weidman, Ph. D., Assistant Geologist, Wisconsin Geological and Natural History Survey. 1898. Pp. iv, 63; 10 plates; 13 figures in the text. *Out of print.*

Bulletin No. IV. Economic Series No. 2.

On the Building and Ornamental Stones of Wisconsin. Ernest Robertson Buckley, Ph. D., Assistant Geologist, Wisconsin Geological and Natural History Survey. 1898. Pp. xxvi, 544; 69 plates, of which 7 are colored, and 1 map; 4 figures in the text. Sent on receipt of 30c.

Bulletin No. V. Educational Series No. 1.

The Geography of the Region About Devil's Lake and the Dalles of the Wisconsin, with some notes on its surface geology. Rollin D. Salisbury, A. M., Professor of Geographic Geology, University of Chicago, and Wallace W. Atwood, B. S., Assistant in Geology, University of Chicago. 1900. Pp. x, 151; 38 plates; 47 figures in the text. *Out of print.*

Bulletin No. VI. Economic Series No. 3. Second Edition.

Preliminary Report on the Copper-Bearing Rocks of Douglas county, and parts of Washburn and Bayfield Counties, Wisconsin. Ulysses Sherman Grant, Ph. D., Professor of Geology, Northwestern University. 1901. Pp. vi, 83; 13 plates. Sent on receipt of 10c.

Bulletin No. VII. Economic Series No. 4.

The Clays and Clay Industries of Wisconsin. Part I. Ernest Robertson Buckley, Ph. D., Geologist, Wisconsin Geological and Natural History Survey. 1901. Pp. xii, 304; 55 plates. Sent on receipt of 20c.

Bulletin No. VIII. Educational Series No. 2.

The Lakes of Southeastern Wisconsin. N. M. Fenneman, Ph. D., Professor of General and Geographic Geology, University of Wisconsin. 1902. Pp. xv, 178; 36 plates, 38 figures in the text. A second edition has been issued and will be sold at the price of 50c.

Bulletin No. IX. Economic Series No. 5.

Preliminary Report on the Lead and Zinc Deposits of Southwestern Wisconsin. Ulysses Sherman Grant, Ph. D., Professor of Geology, Northwestern University. 1903. Pp. viii, 103; 2 maps, 2 plates, 8 figures in the text. *Out of print.*

Bulletin No. X. Economic Series No. 6.

Highway Construction in Wisconsin. Ernest Robertson Buckley, Ph. D., State Geologist of Missouri, formerly Geologist, Wisconsin Geological and Natural History Survey. 1903. Pp. xvi, 339; 106 plates, including 26 maps of cities. Sent on receipt of 30 cents.

Bulletin No. XI. Economic S ries No. 7. Second Edition.

Preliminary Report on the Soils and Agricultural Conditions of North Central Wisconsin. Samuel Weidman, Ph. D., Geologist, Wisconsin Geological and Natural History Survey. 1903. Pp. viii, 67; 10 plates, including soil map. Second edition, 1908. Sent, paper bound, on receipt of 10 cents; cloth bound, 20 cents.

Bulletin No. XII. Scientific Series No. 3.

The Plankton of Lake Winnebago and Green Lake. C. Dwight Marsh, Ph. D., Professor of Biology, Ripon College. 1903. Pp. vi, 94; 22 plates. Sent, paper bound, on receipt of 10 cents.

Bulletin No. XIII. Economic Series No. 8.

The Baraboo Iron-bearing District of Wisconsin. Samuel Weidman, Ph. D., Geologist, Wisconsin Geological and Natural History Survey. 1904. Pp. x, 190; 23 plates, including geological map. Sent, paper bound, on receipt of 10 cents.

Bulletin No. XIV. Economic Series No. 9.

Report on Lead and Zinc Deposits of Wisconsin. Ulysses Sherman Grant, Ph. D., Professor of Geology, Northwestern University. 1906. Pp. ix, 100; 8 plates; 10 figures in the text; an atlas containing 18 maps; and a supplementary atlas containing 6 maps; issued in 1909. Sent on receipt of 25 cents.

Bulletin No. XV. Economic Series No. 10.

The Clays of Wisconsin and Their Uses. Heinrich Ries, Ph. D., Assistant Professor of Economic Geology, Cornell University. 1906. Pp. xii, 259; 30 plates, including 2 maps; 7 figures in text. Sent on receipt of 18 cents.

Bulletin No. XVI. Scientific Series No. 4.

The Geology of North Central Wisconsin. Samuel Weidman, Ph. D., Geologist, Wisconsin Geological and Natural History Survey. Pp. xxxi, 697; 86 plates, including 2 maps; 38 figures in the text. 1907. Sent on receipt of 40 cents.

Bulletin No. XVII. Scientific Series No. 5.

The Abandoned Shore-lines of Eastern Wisconsin. J. W. Goldthwait, Ph. D., Assistant Professor of Geology, Northwestern University. Pp. x, 134; 38 plates; 37 figures in the text. 1907. Sent on receipt of 15 cents.

Bulletin No. XVIII. Economic Series No. 11.

Rural Highways of Wisconsin. W. O. Hotchkiss, B. S., Instructor in Geology, University of Wisconsin; in charge of Economic Geology, Wisconsin Geological and Natural History Survey. 1906. Pp. xiv, 135; 16 plates; 2 figures in the text. Sent on receipt of 10 cents.

Bulletin No. XIX. Economic Series No. 12.

Zinc and Lead Deposits of the Upper Mississippi Valley. H. Foster Bain. Director of State Geological Survey of Illinois. Washington, D. C. 1907. Pp. xii, 155; 9 plates, including 5 maps; 45 figures in the text. Sent on receipt of 6 cents.

This bulletin is a reprint of Bulletin No. 294 of the United States Geological Survey. *Only a small number of copies were reprinted for local use. It has not been sent out to libraries and exchanges.*

Bulletin No. XX. Economic Series No. 13.

The Water Powers of Wisconsin. L. S. Smith, C. E.; Engineer Wisconsin Geological and Natural History Survey; Engineer U. S. Geological Survey. Pp. xvi, 354; 54 plates; 17 figures in the text. 1908. Sent on receipt of 25 cents.

Bulletin No. XXI. Scientific Series No. 6.

The Fossils and Stratigraphy of the Middle Devonic of Wisconsin. Herdman F. Cleland. Professor of Geology, Williams College. Pp. 206; 55 plates. 1911. Sent on receipt of 25 cents.

Bulletin No. X II. Scientific Series No. 7.

The Inland Lakes of Wisconsin; the dissolved Gases of the Water and their biological Significance. Edward A. Birge and Chancey Juday. Pp. xxi, 254; 10 plates, 142 figures in text; all diagrams of gases and plankton. 1911. Sent on receipt of 15 cents.

ROAD PAMPHLETS.

Road Pamphlet No. 1.

Earth Roads. Arthur R. Hirst, B. S., Highway Engineer, Wisconsin Geological and Natural History Survey. Pp. 26; 13 figures. Sent on receipt of 2c postage.

Road Pamphlet No. 2.

The Earth Road Drag. Arthur R. Hirst, B. S. Highway Engineer, Wisconsin Geological and Natural History Survey. Pp. 16; 4 figures. Sent on receipt of 2c postage.

Road Pamphlet No. 3.

Stone and Gravel Roads. Arthur R. Hirst, B. S. Highway Engineer, Wisconsin Geological and Natural History Survey. Pp. 27; 11 figures. Sent on receipt of 2c postage.

Road Pamphlet No. 4.

Culverts and Bridges. Arthur R. Hirst, B. S. Highway Engineer, Wisconsin Geological and Natural History Survey. Pp. 47; 16 figures. Sent on receipts of 2c postage.

2. BIENNIAL REPORTS.

The Survey has published seven biennial reports, which relate to administrative affairs only and contain no scientific matter.

First Biennial Report of the Commissioners of the Geological and Natural History Survey. 1899. Pp. 31.

Second Biennial Report of the Commissioners of the Geological and Natural History Survey. 1901. Pp. 44.

Third Biennial Report of the Commissioners of the Geological and Natural History Survey. 1903. Pp. 35.

Fourth Biennial Report of the Commissioners of the Geological and Natural History Survey. 1904. Pp. 42.

Fifth Biennial Report of the Commissioners of the Geological and Natural History Survey. 1907. Pp. 45.

Sixth Biennial Report of the Commissioners of the Geological and Natural History Survey. 1909. Pp. 45.

Seventh Biennial Report of the Commissioners of the Geological and Natural History Survey. 1911. Pp. 55.

4. HYDROGRAPHIC MAPS.

There have been prepared hydrographic maps of the principal lakes of southern and eastern Wisconsin. This work is in charge of L. S. Smith, C. E., Associate Professor of Topographic and Geodetic Engineering, University of Wisconsin.

The maps are as follows:

		Size of Plate, Inches.	Scale. Inches per mile.	Contour. Interval, feet.
No. 1.	Lake Geneva	17.5x10.8	2	10
No. 2.	Elkhart Lake	15.5x13.1	5	10
No. 3.	Lake Beulah	22.5x20.0	6	10
No. 4.	Oconomowoc-Waukesha Lakes	29.8x19.1	2	10
No. 5.	The Chain of Lakes, Waupaca	21.7x20.6	6	10
No. 6.	Delavan and Lauderdale Lakes	22.5x16.8	4	10
No. 7.	Green Lake	26.0x17.8	3.2	20
No. 8.	Lake Mendata	23.7x19.5	6	5
No. 9.	Big Cedar Lake	18.0x13.5	2.9	10
No. 10.	Lake Monona	17.6x17.3	4	5

In all of these maps the depth of the lakes is indicated by contour lines, and by tints in all except No. 1. They are sent on receipt of 10 cents each and may be had either mounted in a manilla cover, or unmounted.

GEOLOGICAL MODEL OF WISCONSIN

The Survey has prepared a model which shows in great detail the topography of the state. It is designed for use in schools, libraries, and similar public institutions, and is 49 inches by 45 inches in size. It is supplied to such institutions in Wisconsin at the cost of labor and materials used in its construction. The form showing topography alone is furnished for $31 and the form showing geology in addition to topography is furnished for $46. A special circular with illustration of the model may be had on application.

All correspondence relating to the Survey should be addressed to

E. A. BIRGE, *Director*,
Madison, Wis.