Public documents of the state of Wisconsin ... for the fiscal term ending June 30, 1914. Volume 8 1912/1914

Madison, Wisconsin: Democrat Printing Company, 1912/1914

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, 1914

VOLUME 8

MADISON
DEMOCRAT PRINTING COMPANY, STATE PRINTER
1916

PUBLIC DOCUMENTS FOR 1913—1914

CONTENTS OF VOLUME I.

CONTENTS OF VOLUME II.

CONTENTS OF VOLUME III.

CONTENTS OF VOLUME IV.

CONTENTS OF VOLUME V.

CONTENTS OF VOLUME VI.

CONTENTS OF VOLUME VII.

CONTENTS OF VOLUME VIII.

CONTENTS OF VOLUME IX.

TWENTY-FIFTH REPORT

OF THE

STATE BOARD OF HEALTH OF WISCONSIN

FOR THE

Term Ending June 30th, 1914

WITH

Report of the State Bureau of Vital Statistics For the Calendar Years of 1912 and 1913

C. A. HARPER, M. D.
State Health Officer

MADISON, WIS.
DEMOCRAT PRINTING COMPANY, STATE PRINTER
1914

WISCONSIN STATE DEPARTMENT OF HEALTH.

Members of the Board.

W. F. Whyte, M. D., President ..... Watertown.
E. S. Hayes, M. D. ..... Eau Claire.
C. H. Sutherland, M. D. ..... Janesville.
H. A. Meilike, M. D. ..... Clintonville.
Otho Fiedler, M. D. ..... Sheboygan.
C. H. Stoddard, M. D. ..... Milwaukee.
C. A. Harper, M. D. ..... Madison.
State Health Officer

Deputy State Health Officers.

G. W. Henika, M. D. ..... Madison.
G. E. Hoyt, M. D. ..... Milwaukee.
L. E. Spencer, M. D. ..... Wausau.
Fred L. Johnson, M. D. ..... Eau Claire.
W. C. Bennett, M. D. ..... Rhinelander.

Bureau of Vital Statistics.

C. A. Harper, M. D., State Registrar ..... Madison.
L. W. Hutchcroft, Statistician ..... Madison.

W. G. Kirchoffer, Consulting Sanitary Engineer ... Madison.
Frank R. King, State Plumbing Inspector ..... Madison.
W. G. Mase, Hotel & Restaurant Inspector ..... Madison.
E. U. F. Loether, Hotel & Restaurant Inspector .... Eau Claire.

State Laboratory of Hygiene
Laboratory of the State Board of Health.

W. D. Stovall, M. D., Bacteriologist ..... Madison.
E. J. Tully, S. B. Chemist ..... Madison.

LETTER OF TRANSMITTAL.

STATE OF WISCONSIN

Office of the Secretary of the State Board of Health.

Madison, Wis., June 30, 1914.

To His Excellency, FRANCIS E. MCGOVERN,

Governor of the State of Wisconsin.

Sir: In compliance with the law, the twenty-fifth report of the State Board of Health is herewith submitted, the same being for the biennial period ending June 30th, 1914.

Respectfully submitted,

C. A. HARPER, M. D.

State Health Officer.

SECRETARY'S REPORT

SPECIAL MEETING, NOVEMBER, 1912.

A special meeting of the State Board of Health was called at this time to consider the following subjects:

First:—The appointment of Medical Examiners under the State Life Fund.

Second:—The recommendation to the Laboratory Committee of rules governing the use of, by the State Board of Health of the State Laboratory of Hygiene, And

Third:—The adoption upon the recommendation of the United States Public Health and Marine Hospital Service of the "Phenol Coefficient of Disinfectants" and requiring the "Phenol Coefficient" to be stated on the label of each package containing disinfectants offered for sale in this state.

The question of appointing Medical Examiners for insurance under the State Life Fund, as provided for by Chapter 577, laws of 1911, was first considered.

It was moved and carried that the Secretary be instructed to make the appointments of Examiners for the State Life Fund subject to the confirmation of such appointments by the board at the regular meetings.

The board then considered in detail the draft of a set of rules prepared for the use of the State Laboratory of Hygiene by the State Board of Health. A code of rules was recommended to the laboratory committee for adoption.

The Secretary then read the Resolution adopted by the Conference of State and Territorial Health Authorities and the Public Health and Marine Hospital Service which met in joint session in Washington, D. C., on June 1st, 1912.

"*Resolved*,—That the United States Public Health and Marine Hospital Service Hygienic Laboratory Standard Method for the determination of the phenol coefficient of disinfectants be recommended to the several State Boards of Health as the standard method; that all regulations regarding disinfectants be based upon this standard; and that the phenol coefficient be required to be stated on the label of each package containing such disinfectant."

It was moved that the phenol coefficient be adopted by the Wisconsin State Board of Health as the standard for all preparations sold in Wisconsin, and that all manufacturers or distributors offering disinfectants for sale in Wisconsin be required to state the phenol coefficient on the label of each package.

This motion was seconded and carried.

JANUARY MEETING, 1913.

The minutes of the special meeting of the board, held on November 1, 1912, were read and approved.

The Committee on Finance reported that all vouchers presented to the committee since the last meeting of the board, had been carefully examined and were approved.

The Committee on Legislation next presented a tentative outline of bills on the following subjects for consideration.

1. A bill to prohibit dry sweeping. Endorsed by the board.

2. A bill to do away with the exemption clause in Chapter 440, laws of 1911, pertaining to roller towels, and recommending that all towels for the use of guests in any hotel, whether in their private or the public wash room, and all towels in public buildings must be individual towels, and when used and discarded by the individual must not be again used until thoroughly washed and dried. Endorsed by the board.

3. Enacting into law the rule formulated by the State Board of Health in 1909, abolishing the use of the common drinking cup on railroad trains, in railroad stations, in all state buildings, other public buildings, on streets and in public parks, in the public, parochial and private schools and in other educational institutions in the state of Wisconsin, and such other place as the State Board of Health may determine the use of the common drinking cup to be inimical to the public health.

The object of this was to carry out the policy of the board in formulating, as rapidly as possible, its rules and regulations into legislative enactment. Endorsed by the board.

4. A bill to amend section 1562 of the statutes providing that the license money derived from saloon licenses be used to defray the expense of not only supporting the poor, but also for public health administration. No action taken.

5. To amend section 1416—1 of the statutes to include in the list of dangerous, infectious or contagious diseases, "acute anterior poliomyelitis" or "infantile paralysis" and "ophthalmia neonatorum". Endorsed by the board.

6. Section 925—107 of the statutes for the purpose of increasing the term of health officers and health commissioners in cities to four years. Endorsed by the board.

7. To amend section 1411 of the statutes to increase the term of health officers in townships and incorporated villages to two years. Endorsed by the board.

8. To amend section 1415—19 of the statutes providing biennially for a Conference of State Health Officers of towns in addition to the biennial conference of health officers and health commissioners in cities and incorporated villages. Endorsed by the board.

There was a resolution passed by the First State Conference of Health Officers, held in the city of Madison June 12th and 13th, 1912, to the effect that an annual conference of health officers of cities, villages and towns be held.

9. Bill to increase the amount of state aid to county hospitals for the care and treatment of persons suffering from tuberculosis in the advanced or secondary stages from three to five dollars per week. Endorsed by the board.

10. An amendment to section 1416—6 of the statutes, authorizing under certain conditions, the compulsory commitment of tubercular persons to county hospitals, the state tuberculosis sanatorium or other proper institutions was next considered. Endorsed by the board.

11. A bill to provide the State Board of Health with a contingent fund of fifty thousand dollars ($50,000.00) for the two years ending June 30, 1915; this to be used only in suppressing epidemics or giving relief to localities in times of epidemics or great disaster. Endorsed by the board.

12. In addition to the present official force of the board it was recommended to have additional sanitary inspectors, one special inspector for the schools of the state, and a special laboratory man to take charge of the traveling laboratory, and such other additional officials of the board as it might be possible to obtain through a sufficient increase of appropriation by the Legislature of 1913. Such procedure was endorsed by the board.

The board voted to adopt and publish the following rule on the subject of infantile blindness:

Rule 16. Infantile Blindness. *Any physician, midwife, nurse or other person in attendance on a confinement case, shall, within two hours after the birth of the child, use one of the following prophylactic treatments for the prevention of infantile blindness or ophthalmia neonatorum.*

1. Two drops of a one per cent fresh solution of nitrate of silver to be dropped in each eye after the eyelids have been opened.

2. Two drops of a 25 per cent solution of argyrol or two drops of a 5 per cent solution of protorgal should be dropped in each eye in the same manner as when silver nitrate is used.

The following code of rules was adopted relating to the sanitary care of schools.

RULES RELATING TO THE SANITARY CARE OF SCHOOLS.

Under the authority granted by section 1408 of the statutes, authorizing the State Board of Health to adopt and enforce rules for the proper sanitary care of schoolhouses and the premises connected therewith, the State Board of Health hereby publishes and declares the following rules to be of general application throughout the state. These rules were officially adopted by the State Board of Health on January 29, 1913.

Rule 17. Attendance at School, when Prohibited. *All teachers, school authorities and health officers having jurisdiction shall not permit the attendance in any private, parochial or public school of any pupil afflicted with a severe cough, a severe cold, itch, lice or other vermin, or any contagious skin disease, or who is filthy in body or clothing, or who has any of the following dangerous, contagious or infectious diseases to wit: Diphtheria, smallpox, scarlet fever, measles, whooping cough, chickenpox, mumps, pulmonary tuberculosis, Asiatic cholera (cholerine), yellow fever, typhus fever, bubonic plague, cerebro-spinal meningitis or acute anterior poliomyelitis. The teachers in all schools shall, without delay, send home any pupil who is obviously sick even if the ailment is unknown, and said teacher shall inform the parents or guardians of said pupil and also the local health officer as speedily as possible, and said health officer shall examine into the case and take such action as is reasonable and necessary for the benefit of the pupils and to prevent the spread of infection.*

Rule 18. Duty of Parents. *Parents, guardians or other persons having control of any child who is sick in any way, or who is afflicted with any disease listed in Rule 17, shall not permit said child to attend any public, private or parochial school or to be present in any public place.*

Rule 19. Duty of Teachers, Etc. *School teachers, pupils or other persons shall not be admitted to any public, private or parochial school who have come from, or who reside in any house or building which harbors or is infested with Asiatic cholera (cholerine), yellow fever, smallpox, typhus fever, bubonic plague, diphtheria (membranous croup), scarlet fever (scarlatina), measles including rotheln, cerebrospinal meningitis or acute anterior poliomyelitis. (This rule has been changed since the first edition was published so as to conform to the provisions of Rule 2, of the rules adopted and published by the State Board of Health, relative to the prevention and control of communicable diseases.)*

Rule 20. Air and Floor Space. *Schoolhouses shall have in each classroom at least fifteen square feet of floor space, and not less than two hundred cubic feet of air space per pupil, and shall provide for an approved system of indirect heating and ventilation, by means of which each classroom shall be supplied with fresh air at the rate of not less than thirty cubic feet per minute for each pupil, and warmed to maintain an average temperature of 70 degrees Fahr. during the coldest weather.*

NOTE. A local or state building permit must be obtained for all new schools both public and parochial. (See building code published by the State Industrial commission.)

Rule 21. Duty of Health Officers. *Local health officers having jurisdiction shall dismiss forthwith any schoolroom in which at least 200 cubic feet of air space is not supplied to each pupil. The school authorities shall without delay make provisions for the pupils in accordance with the requirements stated in Rule 20.*

Rule 22. Ventilation. *Proper ventilation must be provided in all schoolrooms and when ventilation ducts do not exist, or are inadequate, it shall be the duty of the teacher to flood the schoolroom with fresh air by opening windows and doors at recess and noon time and also whenever the air becomes close and foul. Pupils should be given gymnastic exercises during the time the windows are open in cold weather.*

When windows are the only means of ventilation they should be so constructed as to admit of ready adjustment both at the top at bottom, and some device shall be provided to protect the pupils from currents of cold air. The top of the windows shall be as near the ceiling as the mechanical construction of the building will allow.

Rule 23. Heating. *It shall be unlawful for any school board, board of school directors, board of education, or other school officials in Wisconsin, to use a common heating stove for the purpose of heating any schoolroom, unless each such stove shall be in part enclosed within a shield or jacket made of galvanized iron or other suitable material, and of such height and so placed as to protect all pupils while seated at their desks from direct rays of heat.*

Rule 24. Lighting. *Light shall be admitted from the left, or from the left and rear of classrooms. The glass area of windows shall equal at least one-fifth of the floor area of the schoolroom, and no pupil shall be farther removed from the principal source of light than twenty-two feet.*

Rule 25. Sweeping and Cleaning. *All floors must be thoroughly swept, or cleaned by a vacuum cleaner each day, either after the close of school in the afternoon, or one hour before the opening of school in the morning. Before sweeping is started the floors must be sprinkled with moist sawdust, or other substance so as to prevent the raising of dust. [The floors in all schoolrooms and halls should be thoroughly scrubbed with soap and water at least once each month.]*

Rule 26. Drinking Water. *All schoolhouses must be supplied with pure drinking water. If the drinking water is obtained from wells, satisfactory troughs and drains must be provided so as to carry away the waste water and prevent the creation of mudholes near the opening of the well. When water is not supplied at the pump, from water faucets, or from sanitary flowing drinking fountains, covered tanks or covered coolers, with free flowing faucets, must be supplied. All drinking fountains should be constructed of smooth glass or pressed metal.*

Rule 27. Toilets. *Water closets, dry closets and outhouses shall be kept clean and sanitary at all times. Water closets, and dry closets when provided, shall be efficient in every particular; and when said closets are not provided, then good fly-tight, well*

ventilated outhouses for both sexes, separated by closely built fences, shall be provided. Good, dry walks shall lead to all outhouses, and closely built screens, or shields, shall be built in front of them. Outhouses for males shall have urinals arranged with stalls and with conduits of galvanized iron, or other impervious material, draining into a sewer, vault, or other suitable place.

Rule 28. *Health officers shall enforce these rules, and promptly enter prosecution for any violation thereof.*

NOTE. In order to comply with the provisions of Rule 20, regarding heating and ventilation, the state board of health makes the following recommendations with reference to the installation of heating and ventilating systems in new buildings or in buildings where a change must be made in the system:

1. In a gravity system of ventilation in connection with a furnace or steam plant the flues for admitting fresh air to the room must have a horizontal area of not less than one square foot for each nine persons that the room will accommodate.

2. The flues for a fan system of ventilation shall have a horizontal area of not less than one square foot for each 15 persons that the room will accommodate. The ventilation of school buildings by this system must be so designed that the air pressure in any classroom will be in excess of that of the outside air.

3. The introduction of cold air from the outside of the building at the base of a direct radiator known as the "direct indirect" system of ventilation must not be used.

4. One or two room buildings, heated by hot air, stoves or furnaces should have a cold air intake, the cross section of which is equal to 0.004 of the floor area of the room or rooms heated. The vent flues should have a net area equal to that of the cold air intake.

Upon motion, which was seconded and carried, Miss Dastych was reappointed as a member of the Committee of Examiners for Registered Nurses.

The Secretary reported that the rules for the use of the State Laboratory of Hygiene, which were recommended at the special meeting of the Board on November 1, 1912, had not yet been approved by the Laboratory Committee. Several changes, some of which were considered very unsatisfactory, were recommend-

ed by the Director of the Laboratory and final action on the adoption of the rules had been delayed on this account.

The Secretary then read the following letter from Pres. C. R. Van Hise, the President of the University of Wisconsin, who is, by virtue of his office, a member of the Laboratory Committee:

January 29, 1913.

"My dear Dr. HARPER:—

In regard to the rules controlling the hygienic laboratory, you may record my vote as being in favor of their adoption in the form contained in your last letter to me regarding the subject.

Yours very truly,
(Signed) CHARLES R. VAN HISE."

The Board was informed by the Secretary that the draft of rules, which met with the approval of President Chas. R. Van Hise, are the same rules which were approved by the State Board of Health at the special meeting of the Board November 1, 1912, Madison, Wis., Washington Building, adopted and incorporated in the minutes of said meeting.

Dr. Wm. F. Whyte, President of the Board, and Dr. C. A. Harper, Secretary, two members of the Laboratory Committee, voted for the adoption of the rules as presented to Pres. C. R. Van Hise. These rules and regulations, therefore, as incorporated in the minutes of the special meeting, November 1, 1912, Madison, Wisconsin, Washington Building, have been voted for by three of the four members of the Laboratory Committee and stand as the rules governing the State Laboratory of Hygiene.

Dr. M. P. Ravenel, Director of the State Laboratory of Hygiene, appeared at the meeting and presented the following report of the work in the Laboratory since the last regular meeting:

"The following specimens have been received at the State Hygienic Laboratory, July–December, 1912, inclusive:

Diphtheria	643
Typhoid	560
Sputum	1091
Rabies	49
Water	431
Miscellaneous	328
Total	3102

Number of Patients who have taken the Pasteur treatment 21."

JUNE MEETING, 1913.

After discussion the Board agreed that it is not advisable to recommend the use of a 25% solution of argyrol or a 5% solution of protorgal until further investigations have been made in the Laboratory to determine whether or not these preparations will deteriorate within a reasonable time so as to render them useless for the prevention of infantile blindness.

The Board ordered that when the rule is printed the following footnote be inserted:

"Nitrate of silver is to be preferred in all cases. When argyrol or protorgal are used, the solution must be absolutely fresh."

The Board next considered the provisions of Chapter 344, Laws of 1913, relating to the appropriation to the Board for distributing nitrate of silver free of charge to the physicians and midwives of the state for the prevention of infantile blindness. Samples of several containers furnished by the manufacturers for distributing nitrate of silver were exhibited, and the Board endorsed the wax ampule manufactured by Schieffelin & Co., as the most suitable for general distribution of this character.

The appointment of Miss Ella F. McGovern, as a member of the Committee of Examiners of Registered Nurses, was confirmed by the Board.

In this connection the Board also discussed the question of determining the reputability of Training Schools. On this matter the Board rules that the only safe method of procedure in this case is to employ a reliable nurse or other competent person to make a careful investigation of all questionable schools for a series of past years. This was ordered so that the Board would have before it the facts to use as a basis for refusal to accept a training school as reputable.

The following resolution on the subject was unanimously adopted by the Board:

"Resolved, That the Secretary of the State Board of Health be requested to employ a practical graduate nurse to investigate and report to the Board on the reputability of all training schools in question.

"It was further resolved, That all schools offering a systematic course of training in nursing be accepted as recognized training schools without further question; in all other cases a thorough inspection of the school will be required."

Dr. Karl Smith, the Bacteriologist in the State Laboratory of Hygiene, representing the Director of the Laboratory, Dr. M. P. Ravenel, appeared before the Board, by invitation, and presented the following report of the Laboratory for the period from July 1st, 1912 to June 30th, 1913.

July 1912.	
Diphtheria	60
Typhoid	70
Sputum	213
Water	59
Rabies	9
Miscellaneous	55
Not examined	6
Total	459

August 1912.	
Diphtheria	74
Typhoid	101
Sputum	174
Water	101
Rabies	10
Miscellaneous	50
Not Examined	16
Total	526

September 1912.	
Diphtheria	99
Typhoid	136
Sputum	140
Water	93
Rabies	15
Miscellaneous	39
Not examined	4
Total	526

October 1912.	
Diphtheria	151
Typhoid	108
Sputum	199
Water	67
Rabies	5
Miscellaneous	53
Not examined	16
Total	599

November 1912.	
Diphtheria	150
Typhoid	66
Sputum	155
Water	35
Rabies	7
Miscellaneous	47
Not examined	7
Total	467

December 1912.	
Diphtheria	109
Typhoid	79
Sputum	210
Water	76
Rabies	3
Miscellaneous	41
Not examined	7
Total	525

January 1913.	
Diphtheria	125
Typhoid	60
Sputum	227
Water	40
Rabies	5
Miscellaneous	72
Not examined	7
Total	536

February 1913.	
Diphtheria	201
Typhoid	62
Sputum	223
Water	58
Rabies	3
Miscellaneous	69
Not examined	4
Total	620

March 1913.	
Diphtheria	157
Typhoid	67
Sputum	242
Water	67
Rabies	6
Miscellaneous	86
Not examined	11
Total	636

April 1913.	
Diphtheria	108
Typhoid	92
Sputum	274
Water	88
Rabies	6
Not examined	8
Miscellaneous	97
Total	673

May 1913.

Diphtheria	81
Typhoid	86
Sputum	269
Water	124
Rabies	11
Miscellaneous	58
Not examined	23
Total	652

June 1913 (To 12 M. June 30)

Diphtheria	53
Typhoid	91
Sputum	230
Water	77
Rabies	3
Miscellaneous	56
Not examined	7
Total	517

SUMMARY.

July 1, 1911—July 1, 1912.

Diphtheria	1725
Typhoid	724
Sputum	1596
Water	1019
Rabies	152
Miscellaneous	442
Not examined	84
Total	5742

July 1, 1912—July 1, 1913.

Diphtheria	1368
Typhoid	1018
Sputum	2556
Water	885
Rabies	83
Miscellaneous	710
Not examined	116
Total	6736

In this connection Dr. Smith showed an annual saving to the people of the state from the operation of the Laboratory, if the examinations had been paid for as is the custom in private laboratories, of $18,743.00. The cost of operating the Laboratory for the year covered by the report has not been deducted.

The Secretary then read the following rules relating to the sanitary care and operation of barber shops;

SANITARY RULES

Adopted by the Wisconsin State Barbers' Board of Examiners and approved by the State Board of Health.

Rule 1. All shaving cups and lather brushes must be thoroughly cleansed in hot water before using.

Rule 2. Clean linen must be used on each customer.

Rule 3. All astringents used to stop bleeding must be in liquid or powder form only. THE USE OF STYPTIC PENCILS OR LUMP ALUM IS STRICTLY FORBIDDEN.

Rule 4. No barber shop shall be considered sanitary if it is used as a Living, Dining or Sleeping apartment.

Rule 5. The use of finger bowls, sponges, and powder puffs is prohibited.

Rule 6. A barber who has any venereal or infectious disease will not be allowed to work at the trade.

Rule 7. Every barber shop shall be supplied with sufficient hot water to keep the shop in a sanitary condition.

Rule 8. The practice of dipping towels into a hot water vessel and using on a customer is insanitary and is strictly forbidden.

Rule 9. Hair brushes must be kept clean by washing in a solution of common wash soda at least once a day.

Rule 10. The floors, walls and fixtures of barber shops should at all times be kept clean, all jardinieres and cuspidors should be thoroughly cleaned at least once a day.

Rule 11. All tools used upon a customer who has symptoms of a skin disease of any kind must be sterilized by immersion in pure grain alcohol for at least ten minutes. The barber should wash his hands with soap and hot water and then apply alcohol (alcohol is the best and safest for barbers use.) Every shop should at all times be supplied with a cake of germicidal soap for the barber's hands.

Rule 12. Under no circumstances should a barber strop a razor he is using on a customer who has any symptoms of a skin disease. If one razor will not complete the shave he should lay it aside and use another. To disregard this rule you are more liable to transmit germs than in any other way. After shaving such a customer you should always put the razor handle and blade in alcohol for at least ten minutes.

REMARKS.

The Board recommends that in shops where the compensation does not permit the liberal use of clean linen that it is much more sanitary to not give the hot towel, but use some good wash that can be secured at any good supply house. This is very important as the board will positively prosecute anyone found using the same towel on more than one customer.

These rules were approved as read.

The Board next considered amendments to the rules for the transportation of dead bodies. Some of the members and officials of the State Funeral Directors' Association requested that these rules be amended so as to prohibit shipping unless the bodies have been embalmed except in case of deaths from violence. After a thorough discussion the Board voted unanimously that no additional sanitary safeguards will be obtained from the operation of this proposed amendment to the rules and the amendment was voted down without opposition.

The Board next considered the action taken by the Secretary in approving of the plans and specifications for water supply systems and sewage disposal plants. The action of the Secretary in approving these plans was confirmed by the Board, as provided by Chapter 433, Section 3, laws of 1905.

The Secretary reported the following list of health laws, which had been passed by the legislature up to the time of the Board meeting.

INDIVIDUAL TOWELS.

Chapter 44 states that all towels for the use of guests in any hotel, and all towels in such places and buildings, whether publicly or pri-

vately owned, if the State Board of Health may find the use of the common towel therein to be inimical to the public health, shall be individual towels, and when used by any person they must not again be used until thoroughly washed and dried.

EMBALMING.

Chapter 51 amends section 1409—1 of the statutes so as to make it unlawful for any person not a licensed embalmer to advertise, practice or pretend to practice the art of embalming by either arterial or cavity treatment.

COUNTY VISITING NURSES.

Chapter 93 authorizes the state board of supervisors of any county to employ a graduate trained nurse, who shall assist in the medical inspection of schools, give instructions to tubercular patients, aid in the reporting of tuberculosis and act as a visiting nurse throughout the county.

DRINKING CUPS.

Chapter 158 relates to the use of the common drinking cup in public places and buildings. Under this chapter it is unlawful to furnish or permit the use of the common drinking cup on railroad trains, in railroad stations, in any state or other public building, on the streets or in public parks, in the public, parochial or private schools or other educational institutions, in hotels and lodging houses, theaters, department stores, barber shops, or such other places as the use of the common drinking cup may be dangerous to public health.

STATE CONFERENCE OF HEALTH OFFICERS.

Under the provisions of Chapter 193, the State Board of Health is authorized to provide biennially for a state conference of health officers and health commissioners of cities, incorporated villages and townships, the expense of the health officer when attending this conference to be paid by the township, incorporated village or city upon the certification of the State Health Officer.

VISITING NURSES IN CITIES.

Chapter 194 states that the common council of any city shall have power to employ obstetrical and visiting nurses. This law was enacted so as to leave no doubt regarding the authority of city councils to employ nurses for this important line of work.

REPORT OF CONTAGIOUS DISEASES.

Under the provisions of Chapter 226, acute anterior poliomyelitis or infantile paralysis and opthalmia neonatorum are added to the list of communicable diseases which the physician or responsible head of the family, if there is no physician in attendance, must report to the local health officer.

DRY SWEEPING PROHIBITED.

Under the provisions of Chapter 274, it is unlawful to sweep the floors of railroad stations, passenger cars, public buildings, schools,

hotels, department stores or other places to which the public are invited unless the floor is first sprinkled with water, moist sawdust or other substance so as to prevent the raising of dust. This law does not apply where vacuum cleaners or dustless brushes are used.

COMPULSORY COMMITMENT IN TUBERCULOSIS.

Chapter 308 provides that when a person afflicted with tuberculosis fails to provide a sputum flask or other receptacle in which to deposit the sputum, saliva or other infectious secretions, he may be committed to any county hospital for the care of persons suffering from tuberculosis until such time as the judge of any court of record who makes the commitment is convinced that it is safe for such person to be allowed to mingle with the general public. Under this law it will be possible to properly confine chronic open cases who will not observe the known rules and regulations for preventing the spread of this disease.

PREVENTION OF INFANTILE BLINDNESS.

Chapter 344 authorizes the State Board of Health to distribute free of charge to all physicians and midwives in the state a supply of a one per cent solution of nitrate of silver. A few drops of this solution is to be dropped in the eyes of all new-born children. If this is done there will be no danger of contracting opthalmia neonatorum, or infantile blindness in new-born children. The attending physician or midwife in each confinement case is required to use this solution as directed in the instructions which will be sent out with the silver nitrate solution.

TERM OF OFFICE OF HEALTH OFFICER AND POWER OF REMOVAL.

Chapter 354 provides that the term of office of health officers except in cities of the first class, shall be for two years and until a successor has been elected and qualifies. This law also authorizes the town board, village board or common council, either upon its own initative or upon the recommendation of the State Board of Health, to discharge a local health officer and immediately appoint a new one. Under the provisions of this law the efficiency of the local boards of health will be greatly increased on account of extending the term of office of the health officer, who is the executive officer of the local board of health. In case the health officer neglects or refuses to perform his duties, he may be discharged and a new health officer appointed.

STATE AID FOR COUNTY SANATORIA.

Under the provisions of Chapter 328, the state will contribute the sum of five dollars per week for each patient treated for tuberculosis in the county sanatoria. For this purpose the sum of $50,000 per year is appropriated.

QUARANTINE, EXPENSE OF, GUARDS, ETC.

Chapter 444 requires the health officer to effectually quarantine all cases of quarantinable disease in such manner as the State Board of Health shall determine is necessary. This law also defines quarantine

and provides that the following notice shall appear on the quarantine sign:

"All persons are forbidden to enter or leave these premises without a special written permit from the health officer having jurisdiction and all persons are forbidden to remove, obscure or mutilate this card or to interfere in any way with this quarantine without written orders from said health officer, under penalty of a fine or imprisonment as provided in section 4608 of the statutes."

Local boards of health are empowered by this chapter to employ guards if quarantine is violated or an attempt to violate quarantine is manifested. The guards so employed shall have police powers and may use all necessary means to enforce the quarantine restrictions.

When a person with a quarantinable disease is quarantined in any township, incorporated village or city of this state and is a legal resident of some other township, village or city, the expense for necessary nurses, medical attention, food, etc., if the person is indigent, must be paid by the town, village or city where such person is a legal resident, or by the county where the county system for the care of the poor has been adopted, provided that a sworn statement of such expense is sent to the proper town or county officers within thirty days after the quarantine is removed.

LOCATION OF SLAUGHTERHOUSES.

Chapter 455 amends the old law relating to the location of slaughterhouses so as to provide that no slaughterhouse shall be located within one-eight of a mile of any public highway, dwelling house or building occupied as a place of business.

LICENSE MONEY FOR HEALTH WORK.

Chapter 460 authorizes the city council, village board or town board to use any moneys derived from liquor licenses for the prevention and spread of disease and for public health administration. The old law provided that this money must be used so far as is necessary to defray the expense of supporting the poor.

REPORTING GONORRHEA AND SYPHILIS.

Chapter 516 states that it shall be the duty of every physician to report by number all cases of syphilis and gonorrhea occurring in his practice to the State Board of Health, at such time in such manner as the State Board of Health may direct.

The blanks necessary for making this report will be prepared by the State Board of Health and distributed to all physicians in the state.

WATER SURVEY.

Chapter 568 authorizes the State Board of Health to coöperate with the United States Geological Survey in determining to what extent the natural waters of the state are being contaminated by sewage from cities, industrial waste, creameries, etc. Provision is also made for the investigation of water-borne diseases and the location of the best possible sources of water supply. The appropriation for carrying on this

work is $3,000, providing an equal sum can be obtained by and through the United States Geological Survey for this work.

INSPECTION OF SLAUGHTERHOUSES.

Chapter 583 authorizes the State Board of Health to inspect or to cause to be inspected at least once each year all slaughterhouses in the state not subject to inspection or supervision by the United States government. Local health officers are required upon complaint or upon the request of the State Board of Health to inspect slaughterhouses and to see that they are kept in a sanitary condition. The State Board of Health is authorized to make and enforce all necessary rules and regulations relating to the construction and operation of slaughterhouses. If, after inspection, it is found that any slaughterhouse is so located, constructed, drained, ventilated or maintained as to be dangerous to the public health, the State Board of Health is authorized to make such order or orders as may be necessary to remedy such condition. Any person, firm or corporation, owning any building which is used or operated as a slaughterhouse, is required to report to the State Board of Health, in writing, on or before August 1, 1913, the location and construction of such building, except slaughterhouses subject to federal inspection.

INSPECTION OF HOTELS AND RESTAURANTS.

Chapter 648 defined the terms hotel and restaurant and provided for the payment to the State Board of Health of an annual inspection fee. The State Board of Health is authorized to ascertain and fix such reasonable standards and to prescribe, modify and enforce such reasonable orders as may be necessary to protect the public health and safety in hotels and restaurants. All rules and regulations adopted by the board will be effective ten days after their publication.

Copies of this law, with blanks and other instructions for complying with the provisions of the same, will be distributed by the State Board of Health to all hotels and restaurants in the state upon application. This law did not become operative until January 1, 1914.

DEPUTY STATE HEALTH OFFICERS.

Chapter 674 provides for the establishment in connection with the work of the State Board of Health of a Bureau of Vital Statistics, a Bureau of Sanitary Inspection and Sanitary Engineering, a Bureau of Tuberculosis and Contagious Disease and a Bureau of Public Information and Education. The board is also required to divide the state into five sanitary districts and to appoint a deputy state health officer for each district. The duties of the deputy health officer and also the local health officer are fully outlined in the law. The state Board of Health is authorized by means of rules and regulations to prescribe the character and location of plumbing, drainage, water supply, disposal of sewage, garbage and other waste material, sanitary conditions of streets, alleys, outhouses, cesspools and all sanitary features connected therewith.

CONVALESCENT CAMPS FOR TUBERCULOSIS.

Chapter 679 authorizes the State Board of Control to establish and operate a camp in the forest reserves for persons who are threatened with or are recovering from tuberculosis. The charge for care and maintenance of such persons shall not exceed $3.50 per week.

STERILIZATION LAW.

Chapter 693 provides for the appointment by the State Board of Control of one surgeon, and one alienist who shall coöperate with the superintendents of the state and county institutions in examining the mental and physical condition of all such persons legally confined in these institutions. If the superintendent, the surgeon and the alienist find that procreation is inadvisable in any case it is lawful to perform such operation for the prevention of procreation as shall be decided safest and most effective. No such operation, however, can be performed unless authorized by the State Board of Control.

LICENSING OF PLUMBERS.

Chapter 731 provides for the licensing of journeyman plumbers, master plumbers and plumbing contractors. Provision is also made for the adoption and enforcement by the State Board of Health of rules and regulations governing plumbing, drainage, sewerage and plumbing ventilation in connection with all buildings in this state. The board is also authorized to provide minimum standards which shall be uniform throughout the state.

Copies of the law and application blanks may be obtained from the State Board of Health upon request.

MEDICAL INSPECTION BEFORE MARRIAGE.

Chapter 738 requires that all male persons making application for a license to marry shall at any time within fifteen days prior to such application be examined as to the existence or non-existence in such person of any venereal disease. County clerks are prohibited from issuing a license to marry unless a medical certificate is presented. This act became operative on January 1, 1914.

DRINKING CUPS ON TRAINS.

Chapter 750 requires railroad companies to provide paper drinking cups, free of charge, to all passengers.

SPECIAL MEETING, SEPTEMBER, 1913.

This meeting was called for the purpose of selecting Deputy State Health Officers, as provided by Chapter 674, laws of 1913, and also to consider the question of appointing a Board of Examiners for the Licensing of Plumbers and the State Plumbing Inspector.

In addition the call was made to consider the matter of ap-

pointing a special committee of experts to assist the Board in the preparation of a Plumbing Code.

The call also included consideration of the rules and regulations governing the construction of slaughterhouses, labor camps, hotels and restaurants.

There being two vacancies on the committee of examiners for registered nurses, the Board was also asked to take up the question of appointing new members at this time.

Upon motion, which was duly seconded and carried, the Board first considered the appointment of two members of the Committee of Examiners of Registered Nurses. Miss Anna J. Haswell, the present Secretary of the Board, residing at Madison, and Miss Ella F. McGovern, of Milwaukee, were nominated and reappointed for a term of three years, beginning September 1st, 1913.

The Secretary then took up for discussion with the Board the question of the salary for the various clerks employed by the department.

It was suggested by the Secretary that a small increase in salary be given to all of the general clerks and that the confidential stenographer and the stenographer for the Bureau of Vital Statistics be given an increase such as would insure the retention of their services.

Upon motion, which was seconded and carried, the salary of the confidential stenographer was fixed at one thousand dollars ($1,000.00) per year.

The salary of the stenographer for the Bureau of Vital Statistics was fixed at seventy-five dollars ($75.00) per month.

The salary of Miss Anderson and Miss Warner was raised from $55.00 to $60.00 per month, and the salary of Miss Boyle was raised from $50.00 to $55.00 per month.

In the case of Miss Bennewise, the Board decided that as soon as she qualified for the higher salary under the Civil Service rules, she should receive $60.00 per month.

The Board next considered the question of appointing the Deputy State Health Officers, assigning them to the districts and issuing to them instructions regarding the work to be done.

The State Health Officer was instructed to draw up rules for this work to include as one of the provisions that each Deputy be confined to a certain district unless called to another district by the State Health Officer.

It was moved that the election of the Deputy State Health Officers be taken up one at a time and that the selection be made by ballot. This motion was seconded and carried.

Upon motion which was seconed and carried Dr. J. M. Furstman of La Crosse was unanimously chosen as one of the Deputy State Health Officers.

Dr. G. W. Henika of Madison was chosen as the second deputy, Dr. G. E. Hoyt of Menominee Falls, Dr. W. C. Bennett of Oregon and Dr. L. E. Spencer of Wausau were chosen as the other deputies.

Dr. Hayes then moved that the State Health Officer submit to the Board for their approval the districts in which it is thought best to divide the state, with the name of the deputy to be appointed in each district. Motion carried.

The question of salary for the Deputy State Health Officers was next considered. It was moved and seconded that the salary be fixed to start with at twenty-two hundred and fifty dollars ($2250.00) per year, including necessary traveling expenses and other expenses incident to properly carrying on the work. Motion carried.

The section which requires the Board to adopt and enforce rules and regulations governing plumbing, drainage, sewerage and plumbing ventilation was next considered. It was the uniform judgment of the members that a special committee should be employed to assist the Board in the preparation of these rules.

After carefully considering the various persons who would be available for this work, Dr. Fiedler moved that the following committee be appointed:

Dr. C. A. Harper, State Health Officer; Geo. F. Reeke, Master Plumber of Green Bay, F. R. King, Journeyman Plumber of Milwaukee, W. G. Kirchoffer, Sanitary Engineer, Madison, and C. W. Price, who is now employed by the Industrial Commission. This motion was seconded and carried.

The Board next considered the revision of the rules and regulations relating to the prevention and control of the various communicable diseases, and the following rules were adopted by the Board and ordered published as the law provides:

RULES PERTAINING TO THE PREVENTION AND CONTROL OF CONTAGIOUS DISEASES.

The following are the rules pertaining to the prevention and control of contagious diseases as adopted by the Wisconsin

State Board of Health and published in the official state paper on October 9, 1913.

List of dangerous, contagious diseases. In conformity to the requirements of the law relating to its duties and powers, the State Board of Health of Wisconsin hereby publishes and declares the following as "dangerous and contagious diseases."

Asiatic cholera (cholerine), yellow fever, smallpox, typhus fever, leprosy, bubonic plague, diphtheria (for all sanitary purposes membranous croup must be considered and treated as diphtheria), scarlet fever (scarlatina), typhoid fever, measles, including rotheln, whooping cough, cerebrospinal meningitis, acute anterior poliomyelitis, ophthalmia neonatorum, gonorrhea and syphillis. (All cases of gonorrhea and syphillis are to be reported direct to the State Board of Health, as provided by Chapter 516, Laws of 1913.)

The State Board of Health does hereby adopt and publish the following rules to be of general application throughout the state:

Rule 1. Exclusion from school, etc. *No person suffering from Asiatic cholera (cholerine), yellow fever, smallpox, typhus fever, bubonic plague, diphtheria (membranous croup), scarlet fever (scarlatina), measles, including rotheln, whooping cough, cerebrospinal meningitis, or acute anterior poliomyelitis shall be admitted into any public, parochial or private school, college or Sunday school, or shall enter any assemblage, or railway car, street car, vessel or steamer, or other public conveyance. (Also see RULE 17 which prohibits the attendance at school of children who have chicken pox or mumps.)*

Rule 2. Disease in family. *No person shall be admitted to any public, parochial or private school or college, or Sunday school, from any family in which Asiatic cholera (cholerine) yellow fever, smallpox, typhus fever, bubonic plague, diphtheria (membranous croup), scarlet fever (scarlatina), measles including rotheln, cerebrospinal meningitis or acute anterior poliomyelitis exists.*

Rule 3. Duty of parents. *No parent, guardian or other person having charge or control of any child or children shall allow or permit such child or children to go to school from any family in which a case of Asiatic cholera (cholerine), yellow fever, smallpox, typhus fever, bubonic plague, diphtheria (membranous croup), scarlet fever (scarlatina), measles, cere-*

brospinal meningitis or acute anterior poliomyelitis has recently occurred, without a permit from the board of health or its proper officer. (Also see RULE 17.)

Rule 4. Physicians to report. *It shall be the duty of every physician called to attend a person sick, or supposed to be sick, with any of the diseases declared to be dangerous and contagious diseases by the State Board of Health, within twenty-four hours thereafter to report in writing, the name and residence of such person to the board of health, or its proper officer within whose jurisdiction such person is found; and where a person is taken sick with any of the aforesaid named diseases as are declared dangerous and contagious by the State Board of Health, and a physician is not called, it shall in like manner be the duty of the owner or agent of the building in which such person resides, lives or is staying, or of the head of the family in which such disease occurs to report, in writing, the name and residence of the patient to the local board of health or its proper officer.*

Rule 5. Quarantine. *It shall be the duty of the health officer of every local board of health in this state, when a case of Asiatic cholera (cholerine), yellow fever, smallpox, typhus fever, bubonic plague, diphtheria (membranous croup), scarlet fever (scarlatina), cerebrospinal meningitis or acute anterior poliomyelitis, is reported within his jurisdiction to at once quarantine the house, tenement room or other building as provided by Section 1416—15 of the statutes (Chapter 444, Laws of 1913).*

Rule 6. Care in preventing spread. *Every physician attending a person affected with any of the aforesaid named diseases shall use every possible precaution to prevent communication of the disease to others. To this end the board recommends that a cap and gown or some other sufficient cover for the clothing be worn by physicians while in the presence of dangerous contagious diseases. The face and hands should be washed with soap and water or some disinfecting solution after caring for a patient afflicted with a dangerous, contagious or communicable disease.*

Rule 7. Disinfection. *Any house or building, and its contents, in which a case of Asiatic cholera (cholerine), yellow fever, smallpox, typhus fever, bubonic plague, diphtheria (membranous croup), scarlet fever (scarlatina), cerebrospinal*

meningitis, tuberculosis and acute anterior poliomyelitis, has occurred shall be fumigated and disinfected under the supervision of the board of health, or its proper officer in the manner recommended by the State Board of Health.

Disinfection without fumigation shall be required where a case of opthalmia neonatorum, measles or whooping cough has occurred.

Disinfection is defined to be the washing of all woodwork, doors, casings and other articles which may be infected, with a proper solution of bichloride of mercury, carbolic acid, corrosive sublimate, formaldehyde or other approved disinfectant containing the phenol coefficient as determined by the Marine Hospital Laboratory. (The material used for disinfection can be left at the home by the health officer with instructions for properly doing the work.)

Fumigation is defined to be the liberation in the room of formaldehyde gas in sufficient quantities and under proper conditions to accomplish satisfactory aerial disinfection. This work must always be done by the health officer or some competent person employed by the board of health for that purpose.

For fumigating, liberate in the room, by means of a generator, a 40 per cent solution of formaldehyde, using not less than ten ounces of formaldehyde for every one thousand cubic feet of air space; or place in a large deep vessel six and one-half ounces of permanganate of potash to which add one pint of a forty per cent solution of formaldehyde. Use the permanganate and formaldehyde in the proportions stated for every thousand cubic feet of air space.

Sulphur and solidified formaldehyde are not to be used for disinfecting purposes after death or recovery from any dangerous or contagious disease without the endorsement and approval of the state board of health.

All rooms to be fumigated must contain plenty of moisture and be heated to a temperature above 72 degrees F.

When the material for fumigating is placed in the room all openings should be closed or covered with strips of paper saturated with a strong disinfecting solution and the room left closed for from four to six hours, after which all windows and doors should be opened to allow the free circulation of air.

Follow the fumigating with a thorough cleaning of the premises, wash all woodwork, doors, floors, casings, etc., with an acid

solution of bichloride of mercury two drams (one-fourth ounce) to a gallon of water, or six ounces of carbolic acid[1] to a gallon of water. This cleansing process is as important as fumigation.

All persons sick with typhoid fever should be kept isolated and screened from flies as much as possible, and no one should be allowed to visit the sick room except the immediate attendants. All excreta leaving the patient in the discharges from the bowels, kidneys, throat, or nose must be disinfected at once, using two drams (one-fourth ounce) of bichloride of mercury to one gallon of water, or six ounces of carbolic acid to the gallon of water, or the milk of lime (water from freshly slaked lime) using six parts of water to ten parts of lime. The material to be disinfected should remain standing in vessel with disinfecting solution some hours before emptying. Flies should never be allowed to come in contact with excreta of any kind.

The clothing, bed linen, and any materials which have in any way come in contact with the patient must be thoroughly disinfected, either by boiling, fumigating, or immersing in a solution consisting of two drams (one-fourth ounce) of bichloride of mercury of six ounces of carbolic acid[1] to a gallon of water.

At the special meeting of the State Board of Health on November 1, 1912, the board adopted and ordered published the following rule on the subject of "Disinfectants."

"The Marine Hospital Laboratory method of determining the phenol coefficient of disinfectants is hereby adopted as the standard for all disinfecting preparations sold in Wisconsin, and all manufacturers or distributors offering disinfectants for sale in Wisconsin shall state on the label of each package the phenol coefficient as determined by the Marine Hospital Laboratory."

The sale or use of milk or dairy products from a place where one of the quarantinable diseases is present, or where typhoid fever is present, is strictly forbidden unless the milk is handled, cans and pails washed and stock cared for by persons entirely disassociated with the afflicted family.

Rule 8. Duration of quarantine. *The isolation of patients and duration of quarantine in dangerous, contagious diseases shall be as follows:*

[1] When six ounces of carbolic acid to a gallon of water are used for washing casings, floors, etc., for the purpose of disinfecting them care should be taken not to immerse the hands or other parts of the body in this solution. Use a mop, large brush, or some similar article. When carbolic acid is used for disinfecting the hands, face, or other parts of the body, use a 2% solution 2½ ounces to the gallon of water.

Asiatic Cholera (Cholerine), Yellow Fever.

For the patient: Quarantine until after complete recovery, and disinfection of the premises.

For the exposed person: Quarantine for five (5) days from the date of last exposure.

Smallpox.

For the patient: Quarantine until after all crusts or scales have fallen off or been removed, and the disinfection of the patient and premises.

For exposed persons: Quarantine for fourteen days from date of last exposure, unless successfully vaccinated, and person and clothing disinfected, or protected by a previous attack of the disease and person and clothing disinfected.

Typhus Fever.

For the patient: Quarantine until after complete recovery and disinfection of the premises.

For exposed persons: Quarantine for twenty-one (21) days from date of last exposure.

Bubonic Plague.

For the patient: Quarantine until after recovery, and disinfection of the premises.

For exposed persons: Quarantine for eight (8) days from date of last exposure.

Diphtheria.

For the patient: Quarantine for fourteen (14) days after the beginning of the disease.

For persons associated with or in the family with the patient: Quarantine until after death or recovery of the patient, and disinfection of the person, clothing and premises. Every person convalescent from diphtheria must remain isolated until two successive cultures from the throat, made three days apart, show the absence of diphtheria bacilli.

Scarlet Fever (Scarlatina).

Quarantine of the patient for at least twenty-one (21) days from the beginning of the disease and as much longer as the severity of the case may demand, that is,—until complete desquamation or scaling of the skin of the patient and disinfection of the patient and premises.

Quarantine of all adults living in the family with or in any way exposed to the patient while the house remains quarantined, unless said adults submit to thorough disinfection of their person and clothing and take up their residence in some other building during the time that said quarantine is maintained.

Children in a family associated with a case of scarlet fever may be removed to a separate building after disinfection of their person and clothing and must be kept in isolation for a period of ten days or until the symptoms of scarlet fever develop.

When a patient suffering from scarlet fever is removed to an isolation hospital, the premises from which such patient is taken must be thoroughly disinfected, and all children in the same household must be kept in isolation for a period of ten days from the date on which the afflicted patient was removed from the home.

Isolation of patient and children associated with the patient for ten days after the removal of quarantine and disinfection of premises.

Children convalescing from scarlet fever must not attend school for at least six weeks from the beginning of the disease. Children who have been associated with the patient suffering from scarlet fever shall not attend school for ten days after disinfection of premises and removal of quarantine in quarantined home.

Cerebrospinal Meningitis.

For the patient: Isolation from the rest of the family and quarantine for at least fourteen (14) days after the first appearance of the disease.

Persons living in a house where the disease is present must be quarantined for at least fourteen days and until patient and premises have been properly fumigated and disinfected.

Anterior Poliomyelitis.

It shall be the duty of the health officer of every board of health in this state, where a case of anterior poliomyelitis is found to exist, or supposed to exist, to establish and maintain quarantine for at least three weeks from the beginning of the disease and until patient and premises have been thoroughly fumigated and disinfected as provided for in Section 1416—17

of the statutes. (The room or bed and all excreta from the patient should be carefully screened from flies. Flies carry the contagion.)

Rule 9. Burial of bodies. *The bodies of persons who have died of Asiatic cholera (cholerine), yellow fever, smallpox, typhus fever, bubonic plague, diphtheria (membranous croup), scarlet fever (scarlatina), epidemic cerebrospinal meningitis or acute anterior poliomyelitis, shall be wrapped in a sheet saturated with a solution of bichloride of mercury (one ounce to a gallon of water) or some other efficacious disinfectant and shall be buried or incinerated within thirty-six hours after death. The removal of bodies for burial or incineration from place of death of those who have died of Asiatic cholera (cholerine), yellow fever, smallpox, or bubonic plague, shall take place between the hours of 9 p. m. and 5 a. m.*

Rule 10. Public funerals. *No public or church funeral shall be held in connection with the burial of a person who has died of Asiatic cholera (cholerine), bubonic plague, smallpox, yellow fever, typhus fever, diphtheria (membranous croup), scarlet fever (scarlatina), measles, epidemic cerebrospinal meningitis or acute anterior poliomyelitis, nor shall bodies of such persons be taken into any church, chapel or other public place.*

Rule 11. School and library books. *School books, or books from public or circulating libraries shall not be taken into any house where Asiatic cholera (cholerine), bubonic plague, smallpox, typhus fever, diphtheria (membranous croup), scarlet fever (scarlatina), measles, typhoid fever, pulmonary tuberculosis, epidemic cerebrospinal meningitis or acute anterior poliomyelitis exists, and if school books or library books have already been taken into such house they should be destroyed by the owner or library authorities.*

Rule 12. Tuberculosis in schools. *No person suffering from pulmonary tuberculosis or believed to be suffering from pulmonary tuberculosis, when reported to the health officer as provided for in Section 1416—3 and 1416—4 of the laws of 1907, shall be permitted to attend or frequent public, parochial or private schools, except open air schools especially equipped for such pupils in this state in the capacity of pupil or teacher until the health officer or one of his deputies of the township, incorporated village or city, where the school is located, furnishes a written certificate stating that the individual believed to have*

*pulmonary tuberculosis or suspected of having pulmonary tuberculosis, is free from the disease. (Section 1416—3, Laws of 1907, * * * No person shall interfere with or obstruct the entrance, inspection or examination of any building or house of the occupants thereof by the health officer, commissioner of health, or his assistants of such town, incorporated village or city, or any officer of such department when investigating a reported case.) * * **

Rule 13. Milk and dairy products. *The sale or use of milk or dairy products from a place where Asiatic cholera, smallpox, typhus fever, bubonic plague, diphtheria, scarlet fever, epidemic cerebrospinal meningitis, acute anterior poliomyelitis or typhoid fever is found to exist is strictly forbidden unless the milk is handled, milk utensils washed and stock cared for and product transported by persons entirely disassociated with the quarantined family.*

Rule 14. Infantile blindness.. *Any physician, midwife, nurse or other person in attendance on a confinement case, shall, within two hours after the birth of a child, use one of the following prophylactic treatments for the prevention of infantile blindness or ophthalmia neonatorum.*

1. Two drops of a one per cent fresh solution of nitrate of silver to be dropped in each eye after the eyelids have been opened.

2. Two drops of a 25 per cent solution of argyrol or two drops of a 5 per cent solution of protorgal should be dropped in each eye in the same manner as when silver nitrate is used. (Nitrate of silver is to be preferred in all cases. When argyrol or protorgal are used the solution must be absolutely fresh.)

Quarantinable diseases. *Asiatic cholera (cholerine), yellow fever, smallpox, typhus fever, bubonic plague, diphtheria, scarlet fever (scarlatina), cerebrospinal meningitis and acute anterior poliomyelitis*

Diseases which must be placarded but not quarantined. *Typhoid fever, measles, including rotheln, and whooping cough.*

Reportable diseases which should not be quarantined or placarded. *Tuberculosis, chicken pox, mumps, opthalmia neonatorum, gonnorrhea and syphillis.*

One of the purposes for which the special meeting was called was to appoint a Plumbing Inspector for the state and three members as a Committee of Plumbing Examiners.

The position of Plumbing Inspector, under the law, comes under the Civil Service. The Civil Service Commission was unable to certify names to the Board from which the Board could make an appointment at this time.

It was then moved and carried that the Board adjourn to meet the following week in Milwaukee, subject to the call of the State Health Officer.

SPECIAL MEETING, OCTOBER, 1913.

The question of appointing the Plumbing Examining Committee and the State Plumbing Inspector was taken up for consideration. The Civil Service Commission certified the names of John H. Owen of Racine, W. J. Kuemmerlein, Milwaukee, and Frank R. King of Milwaukee, for the position of State Plumbing Inspector.

It was moved and seconded and unanimously carried that the State Health Officer cast the ballot of the Board for the election of Mr. King as State Plumbing Inspector. The State Health Officer having cast the ballot for Mr. King, he was declared elected as State Plumbing Inspector and his salary fixed by the Board at $1800.00 per annum, and the necessary incidental expenses connected with his work.

The following persons were elected as the committee of examiners for the licensing of plumbers: J E. Robertson of Milwaukee, the master plumber representative, T. M. Ferguson of Madison representing the Journeymen plumbers, and W. G. Kirchoffer of Madison representing the State Board of Health.

Dr. J. M. Furstman, who had been elected as one of the five Deputy State Health Officers at its meeting September 25th, was present and desired a hearing.

The northern district had been tentatively designated as the field of work for Dr. Furstman. He refused to accept the appointment thus creating a vacancy in the position.

The names of Dr. H. E. Burger of Beloit, Dr. Frederick of Milwaukee and Dr. Emil W. Bentzien of Milwaukee were certified by the Civil Service Commission to fill the vacancy.

It was moved and seconded that Dr. Bentzien be elected as Deputy State Health Officer to fill the vacancy which was created as a result of Dr. Furstman's refusal to accept the position.

There being no other nominations the Board proceeded to vote by ballot and Dr. Emil W. Bentzien of Milwaukee received five votes constituting the votes of all the members present and was declared elected as the Deputy State Health Officer, his district to be assigned later.

JANUARY MEETING 1914.

Dr. M. P. Ravenel, the Director of the State Laboratory of Hygiene, was present and submitted the following report covering the work of the Laboratory during the period from July 1, 1913 to January 1, 1914.

REPORT OF THE STATE LABORATORY OF HYGIENE.

July 1913.	
Diphtheria	80
Typhoid	120
Sputum	256
Water	150
Rabies	4
Miscellaneous	58
Not examined	12
Total	680

August 1913.	
Diphtheria	89
Typhoid	105
Sputum	230
Water	95
Rabies	4
Miscellaneous	123
Not examined	9
	655
Sewage reports	205
Total	860

September 1913.	
Diphtheria	93
Typhoid	96
Sputum	195
Water	102
Rabies	5
Miscellaneous	176
Not examined	9
	676
Sewage reports	58
Total	734

October 1913.	
Diphtheria	123
Typhoid	78
Sputum	204
Water	80
Rabies	5
Miscellaneous	57
Not examined	6
Total	552

November 1913.	
Diphtheria	119
Typhoid	88
Sputum	187
Water	49
Rabies	4
Miscellaneous	103
Not examined	10
Sewage	40
Total	600

December 1913.	
Diphtheria	115
Typhoid	63
Sputum	231
Water	72
Rabies	1
Miscellaneous	102
Not examined	15
Total	599

SUMMARY. July 1, 1913—January 1, 1914.	
Diphtheria	618
Typhoid	550
Sputum	1303
Rabies	23
Water	548
Miscellaneous	620
Not examined	60
Sewage	303
Total	4025

Number of doctors and health officers on record 1792.

Number of towns on record 581.

The Board then took up for discussion Chapter 648, Laws of 1913, relating to the licensing of hotels and restaurants and the appointment of one or more Hotel Inspectors.

The following list of candidates eligible for the position of state hotel and restaurant inspector was submitted by the State Civil Service Commission.

Walter G. Mase, Darlington; Bert Honeycomb, Madison, William B. Smith, Canton, Ill.; and Ernest Loether, Eau Claire.

Walter G. Mase of Darlington and Ernest Lowther of Eau Claire were selected by the board as the state hotel and restaurant inspectors.

The State Health Officer was then instructed to notify each candidate of the action of the Board and to confer with the two candidates appointed to these positions as to the manner of the work and the time of becoming officially connected with the Board.

Dr. Harper then moved that Dr. Fred Johnson, who had tentatively been appointed as a Deputy State Health officer for the fourth district for a period of one year, dating from October 17th, 1913, be confirmed. This motion was seconded by Dr. Hayes and amended so as to provide that the State Health Officer be instructed to cast the ballot of the members present for Dr. Johnson. The amendment to the motion was accepted and the motion carried unanimously.

Dr. Stoddard then moved that the following rules governing the Board of Examiners for the examining and licensing of plumbers be adopted. This motion was seconded and carried.

In compliance with Section 959—55, Chapter 731, Laws of 1913, the State Board of Health hereby declares the following rules and regulations applicable to the Committee of Plumbing Examiners:

1. The Committee of Plumbing Examiners at the first meeting shall elect a chairman and secretary from its number.

2. The minutes of each meeting shall be incorporated in a suitable book obtained for this purpose, subject to the approval of the State Board of Health or the State Health Officer.

3. The book containing the minutes of the meetings shall be kept in the vault of the State Board of Health except while in use during the meeting of the Committee, or when used by the State Board of Health or its official representatives.

4. All records of the Committee of Examiners shall be stored in the office of the State Board of Health.

5. All communications pertaining to plumbing, if addressed to the Committee of Examiners or any of its members, must immediately be turned into the office of the State Board of Health and kept on file in the office.

*6. In compliance with section 959—55–2 of the law, a quorum of the Committee of Examiners shall consist of two (2) members, each "shall receive a compensation of ten dollars per day and expenses for each day in which such member is actually engaged in attendance upon the meetings of the Committee * * * No one member of the Committee can act in any official capacity unless especially called upon by the State Board of Health or the State Health Officer to assist said Board in the performance of its duties.*

7. Any and all communications that may be sent out by the Committee of Examiners, or any member of such Committee must be signed—Wisconsin State Board of Health, Division of Plumbing, Per.....

8. If it is necessary to refer to correspondence on file in the office of the State Board of Health, request should be made of the Chief Clerk of the Plumbing Division for such correspondence, who will insert a card, giving the date of such letter, by whom written, and the name of the member of the Committee who takes the letter in charge. The letter must be returned at as early a date as possible.

9. All calls for letters or papers to be used by members of the Committee of Plumbing Examiners, must be made to the Chief Clerk of the Plumbing Division.

10. The meetings of the Committee of Plumbing Examiners shall be called by the State Board of Health or the State Health Officer at such time and place as the State Board of Health or the State Health Officer may direct, to transact certain business outlined in the call. When the business of the committee is completed, the Committee officially stands adjourned.

11. The regular examinations for the licensing of journeyman and master plumbers will be held during the months of January and July of each year, and special examinations will be held at such time as the State Board of Health may direct.

The place of all regular examinations and special examinations shall be determined by the State Board of Health.

12. All examination questions for the licensing of plumbers, if gotten out by the Committee of Plumbing Examiners, must be

submitted to the State Board of Health or the State Health Officer for correction and approval before such examination is given.

13. All examination papers and markings for master and journeyman plumbers must be submitted to the State Board of Health or the State Health Officer for consideration before finally passed upon and licenses issued by the State Board of Health.

14. All examination papers, with marking, must be filed in the office of the State Board of Health as official records.

15. In examinations for licensing journeyman and master plumbers the markings on the practical work must be filed in the office of the State Board of Health as official records.

16. Applicants for examination shall be known by number. This number is to be placed upon each sheet of the written examination and the applicant will be known, not only during the written examination, but also during the practical examination, by number. Each applicant will be given a card on which he places his name and address and also the number assigned to him.

The following rules on the subject of Camp sanitation were adopted and ordered published.

REGULATIONS RELATING TO CAMP SANITATION.

The State Board of Health hereby publishes the following regulations, relating to the construction and operation of industrial camps, to be of general application throughout the state. These regulations were adopted by the board on January 9, 1914, and were published in the official state paper on March 27, 1914. Such regulations, therefore, have the full force of the law.

Regulation 1. *Hereafter operators, contractors and all other persons, who may establish an industrial camp or camps, for the purpose of logging, ice cutting or any like industry, or for the purpose of construction of any road, railroad or other work requiring the maintenance of camps for men engaged in such work, or any other temporary or permanent industrial camp of whatever nature, shall report to the State Health officer concerning the location of such camp or camps, and shall arrange and maintain such camp or camps in a sanitary condition as outlined in these regulations.*

Regulation 2. *The term "camp" as used in these regulations shall include any lumbering, mining, railway construction*

or other camp where men are employed and housed in temporary quarters; such as cars, tents, buildings or other enclosures other than the bona fide homes of the employees.

Regulation 3. *Every camp must be located on a site that is high, well drained and shall be selected with regard to its healthfulness.*

Regulation 4. *The general scheme of the structure of the camps should be as follows: Stable and kitchens should be separated by a distance as great as consistent with the natural topography of the land and so located as to prevent any pollution of the water supply with the necessity for convenient access to the stables. The stables and toilets for the men in the camp must be so located that their natural drainage is away from the water supply.*

Regulation 5. *The use of the toilets provided for the men should be made obligatory and instant discharge of any employees polluting the soil must be rigidly enforced.*

Regulation 6. *Every building, car, tent or other enclosure occupied as sleeping quarters by the employees engaged in any camp or works shall contain at least 225 cubic feet of air space for every occupant thereof, and shall be supplied with windows for purposes of light and ventilation, constructed to open.*

Regulation 7. *In addition to windows there shall be other means for ventilating sleeping, dining and living quarters, by having inlet and outlet ducts of sufficient area provided to keep the atmosphere reasonably pure. Such provision shall be to the satisfaction and meet the approval of the State Board of Health.*

Regulation 8. *The kitchen and eating house should be effectively screened when used during the summer months. The bunk houses should also be screened if used during the summer. All food supplies must be carefully screened from flies and other vermin.*

Regulation 9. *All garbage must be collected in covered cans and incinerated, buried, fed or hauled away to some remote place.*

Regulation 10. *Non-inflammable refuse, such as tin cans, should be collected daily and placed in a deep earth pit and covered with a light covering of earth each day, or covered with oil and burned over. During the winter season, this material as well as the garbage may be deposited at a point at least 100*

feet from the camp and then properly cared for at the first opportunity in the spring.

Regulation 11. *Waste water from the kitchen, wash and bunk houses in summer camps must be carried to trenches lined with quick lime and at a safe distance from water supply.*

Regulation 12. *There must be a thorough and systematic scrubbing of kitchen and eating houses, at least once each week. The floors should be swept daily. (Dry sweeping is prohibited by law.)*

Regulation 13. *The supply of water for the camp should be carefully decided upon, and an adequate supply free from any possible chance of contamination must be provided.*

Regulation 14. *All sick from whatever cause must be isolated from the remainder of the crew immediately.*

Regulation 15. *All persons engaged in the care of the premises and handling of the food, particularly cooks and helpers, should be carefully examined and particular attention paid to the point as to whether or not they have suffered from typhoid fever or tuberculosis within recent years.*

Regulation 16. *Floors in bunk houses should be swept daily and scrubbed with hot suds at least once each week. (Dry sweeping is prohibited.)*

Regulation 17. *All bunk houses should be provided with floors, and the lower tier of bunks should be raised at least six inches above the floor.*

Regulation 18. *All blankets should be hung outside for airing at least twice a month. Bunks should be furnished with clean straw, hay or ticks filled with same. Mattresses are not recommended as they cannot be cleaned easily.*

Regulation 19. *Privy vaults shall be so constructed at every camp that they can be effectively cleaned of the contents. Pits shall not be less than four feet in depth and the contents shall be treated daily, when used during the summer season, either by a solution of milk of lime (strong whitewash of fresh slaked lime) one gallon to every square yard of pit, or the sprinkling of five pounds of powdered chloride of lime to the same area. A liberal sprinkling of fresh chloride of lime shall also be applied daily to the floors of privies and lavatories. All closets shall be at least 100 feet distant from the water supply, and so located that drainage from privy vaults toward water supply is impossible.*

Regulation 20. *Whenever smallpox, diphtheria or scarlet fever shall appear in any camp, it is the duty of the physician in charge, the contractor or the superintendent of such camp to notify the local health officer in whose district such camp is located, within twenty-four hours, and it is the duty of such health officer when thus notified to see that said patient is removed to a proper place of isolation, or place such patient or patients under quarantine at such camp, and the contractor or superintendent, when necessary, shall provide suitable accommodation for such patient or patients.*

Regulation 21. *Copies of these regulations shall be hung or posted in every kitchen, dining room, sleeping room or other building in camps where employees may frequent the same in order that all may be conversant with their requirements.*

The following information should be furnished on the establishment of any camp, and thereafter annually to the State Board of Health, Madison, Wisconsin, by the owner or operators of all camps to which the foregoing regulations apply. Returns to be made each year during the first month of the operation of the camp.

Schedule.

Name of Owner or Agent .....
Name of Camp or Camps .....
Location of each Camp .....
Easiest means of access to each Camp .....
Number of men employed .....
When was Camp established and how long will it be occupied

At the suggestion of Dr. Stoddard the State Health Officer was instructed to obtain for each member of the Board the following list of books on public health subjects:

Whipple on *"Typhoid, Its Causation and Prevention"*; Chas. Chapin, M. D. *"Municipal Sanitation"*; Rosenow on *"Preventive Medicine"*; Winslow–Kennicutt–Pratt on *"Sewage Disposal Systems"*.

The members agreed that these publications should be returned to the state office when the person possessing them is no longer a member of the board.

SPECIAL MEETING, APRIL 1914.

This special meeting was called for the purpose of considering and officially adopting, in compliance with the state law, rules and regulations governing the installation and material used in the construction of plumbing; rules and regulations governing hotels and restaurants; and rules governing the construction and operation of slaughterhouses in the state of Wisconsin, not under federal inspection. A provision was also made in the call for the consideration of such other business as might properly come before the Board at that time.

The Board first took up the failure on the part of certain health officials in the state to properly report vital statistics for their respective jurisdictions to the State Board of Health each month as the law requires.

The State Health Officer informed the members that there were a few localities from which we were unable to obtain vital statistic reports promptly. It was agreed that the Deputy State Health Officers should make an investigation of such places in their respective districts and take such action as may be necessary to obtain accurate and complete reports of vital statistics and instigate prosecution in such places where conditions make it necessary.

In cities where health officers fail to obtain proper and accurate reports of vital statistics, such failure will be grounds for the dismissal of such health officers.

The Board next considered officially the rules and regulations governing plumbing and plumbing construction, incorporated in a pamphlet known as the State Plumbing Code.

Mr. F. R. King, State Plumbing Inspector, was present and considered with the members the various provisions of the code. After due consideration, upon motion, which was seconded and carried, the State Plumbing Code was adopted and ordered printed in the official state paper; such rules and regulations then having the effect of law.

The rules and regulations governing plumbing and plumbing construction with charts and sketches illustrating safe methods of plumbing and drainage installations are distributed free of charge to all plumbers, sanitary engineers, health officers and other citizens.

Rules and regulations governing the construction and operation of slaughterhouses in conformity with the authority vested in the State Board of Health by Section 1492ea of the statutes (Chapter 583, Laws of 1913), authorizing the Board to make and enforce necessary rules and regulations relating to the construction and operation of slaughterhouses, not subject to inspection and supervision by the United States government, were next considered.

The tentative rules, as presented, were amended in several particulars and upon motion which was seconded and carried, the following rules were officially adopted.

RULES RELATING TO THE CONSTRUCTION AND OPERATION OF SLAUGHTERHOUSES.

Rule 1.—Drainage and Sewerage. *All slaughterhouses shall have an efficient system of drainage to prevent water or other refuse of any kind from soaking into the ground underneath and around the building, or be drained from the building in such a way as to become a nuisance. Blind wells, cesspools or privy vaults within the slaughterhouse are prohibited. Sewerage conduits shall be made of closed vitrified tile, cast iron with tight joints, or some similar material. Liquid wastes, where practicable, shall be drained into the city sewer, provided that this does not place an undue burden upon existing purification works, or upon the stream into which the city sewage empties; otherwise adequate means for the disposal of the wastes shall be provided. The ground on which the slaughterhouse is situated shall be selected so that proper drainage from the building of surface water and other waste will be accomplished.*

Section 1418.—Slaughterhouses, Location of. *No person shall erect, maintain or keep any slaughterhouse upon the bank of any river, running stream or creek; or throw or deposit therein, any dead animal, or any part thereof, or any of the carcass or offal therefrom; nor throw or deposit the same into or upon the bank of any river, stream or creek, which shall flow through any city, village or organized town, containing two hundred or more inhabitants; or erect, maintain or use any building for a slaughterhouse, except such buildings as are or shall be placed under federal inspection * * * and every person who shall violate any of the provisions of this section shall be deemed*

guilty of a misdemeanor, and upon conviction thereof, shall be punished, for each such violation, by a fine of not less than ten dollars nor more than one hundred dollars, or by imprisonment in the county jail not exceeding six months. And the mayor of the city, president of the village, and the chairman of the town, in which any such slaughterhouse is located, shall have power to and shall cause the same to be immediately removed; and every such officer who shall knowingly permit any slaughterhouse to be used or maintained contrary to the provisions of this section shall forfeit not less than fifteen dollars nor more than fifty dollars. In any county containing a population of one hundred thousand or over, all the provisions of this section relating to slaughterhouses shall apply to all establishments and manufactories in which dead animals, or any part thereof, or of the carcass or offal therefrom, are collected and converted into marketable products.

Rule 2.—Feeding Offal Prohibited. *The feeding of hogs or other animals on the refuse from slaughterhouses shall not be permitted on the premises, nor shall any such refuse be fed to any animals intended for slaughter unless it is first thoroughly cooked. In all cases when the offal is not fed it shall be rendered, buried, burned, or otherwise disposed of so as to prevent the creation of a nuisance. All yards, fences, pens, chutes, alleys, etc., belonging to the premises of such establishment, whether they are used or not, shall be maintained in a sanitary condition, and no nuisance whatsoever shall be allowed in the establishment or on the premises.*

Rule 3.—Water Supply. *All slaughterhouses shall have an abundant supply of water from a well, spring or other source, which is free from contamination, and which shall be available both hot and cold for cleansing purposes in any part of the room or rooms used for slaughtering or preparing meats for consumption as human food.*

Rule 4.—Floors. *All slaughter rooms shall have cement floor constructed in such manner as to be water tight, which shall carry off into a sewer, reservoir or cesspool, provided for that purpose, all blood and wastes; such floors shall be thoroughly scrubbed and cleaned each day after the slaughtering has been completed.*

Rule 5.—Walls and Ceilings. *The walls of slaughtering pens and meat dressing and cooling rooms must be tight and smooth,*

frequently whitewashed or painted, and kept in a sanitary condition, and when necessary they shall be scraped, painted or otherwise treated as required. Where floors or other parts of building, or tables or other parts of the equipment are so old or in such poor condition that they can not be readily made sanitary, they shall be removed and replaced by suitable materials. The building must be so constructed that screening of doors and windows will prevent ingress of flies. No carcass will be allowed to be stored in the building after dressing unless such building is properly screened from flies. Other rooms or compartments in which meat or food products are prepared, cured, stored, packed or otherwise handled shall be kept free from flies and other vermin by screening of the doors and windows and by securely closing all openings through which flies or other vermin may enter.

Rule 6.—Trucks, Tables, Etc. *All trucks, trays, scalding tanks and other receptacles, all chutes, platforms, racks, tables, and all knives, saws, cleavers, and other tools, and all utensils, machinery, and vehicles used in moving, handling, cutting, chopping, mixing, canning, or other processes shall be thoroughly cleaned before and after using.*

Rule 7.—Cleanliness of Employees. *Managers of establishments must require employees to be cleanly. The aprons, smocks or other outer clothing worn by employees who handle meat products shall be kept clean and made of a material that is readily cleansed. Persons who handle meat or meat food products shall keep their hands clean.*

Rule 8.—Healthfulness of Employees. *Persons afflicted with tuberculosis or any other communicable disease shall not be employed in any of the departments or establishments where carcasses are dressed, meat is handled, or meat food products are prepared.*

Rule 9.—Toilet Facilities. *All water closets, toilet rooms and dressing rooms shall be entirely separated from compartments in which carcasses are dressed, or meat or food products are cured, stored, packed, handled or prepared. Water closets and toilet rooms when provided in slaughterhouses shall be conveniently located, sufficient in number, ample in size, and fitted with proper lavatory accommodations. They shall be properly lighted, suitably ventilated, and kept in a sanitary condition. No person shall commit any nuisance whatsoever in the slaughtering*

pens of any abattoir or slaughterhouse. A wash basin or bowl with plenty of soap and water and clean towels shall be conveniently located for use at all times in all slaughterhouses where other lavatory facilities are not provided.

Rule 10.—Slaughter of Diseased Animals. *No animals known to be diseased shall be slaughtered in any building used as a slaughterhouse maintained to prepare meat for human consumption. If the meat of any animal after slaughtering is found to be diseased in part or in whole such meat shall not be put upon the market until the local health officer has been notified and such carcass examined, and only such portions of carcass shall be offered for sale as the local board of health or health officer may designate.*

Rule 11.—Keeping of Animals. *No animals, whether intended for slaughter or not, shall be confined or otherwise maintained within fifty feet of any slaughterhouse.*

Rule 12.—Transportation of Dressed Meat. *All dressed meats hauled or transported in any manner from any slaughterhouse shall be completely wrapped in a clean cotton cloth or canvas cover before removal from the building, and such cotton cloth or canvass cover shall not be used a second time for this purpose until it has been thoroughly washed and cleaned.*

Note.—Retail Establishments. *All retail establishments in which any meat, poultry or other meat food product are kept for sale shall be suitable for such purposes, free from odors, screened and free from flies, shall have facilities for cleaning ice-boxes, meat blocks, cleavers, saws, knives, etc., and shall have refrigerating rooms or ice boxes, with the temperature necessary for the proper preservation of such fresh products. Such ice boxes or refrigerating rooms shall be constantly kept in a clean and wholesome condition and free from odors, and no spoiled meat or poultry shall be kept therein. No poultry or meat product shall be exposed on the counters or other places where it would be subjected to flies, street dust or other contamination, and no fresh meat or poultry products shall be exposed on the counters or otherwise during the spring, summer or fall months, or at other times when the temperature is high enough to cause any deterioration, without proper icing facilities and all such exposure with icing facilities shall also be in such manner as to be fully protected from flies, dirt and other contamination. No fresh meat, poultry or meat products shall be offered for sale in*

a retail market which have been handled by intending purchasers. All deliveries of fresh meat, poultry or meat products shall be so protected as to reach the consumer free from contamination.

Upon motion which was seconded and carried, the following rules were adopted as being the official rules governing the sanitary and safety conditions of hotels and restaurants. The rules were adopted and ordered published in the official state paper.

RULES AND REGULATIONS

for the sanitary and safe conditions of hotels and restaurants, adopted under authority of Chapter 648, Laws of 1913. These rules and regulations were officially adopted by the Wisconsin State Board of Health on April 6, 1914, and were published in the official state paper on April 7, 1914. Such regulations therefore have the full force of law.

Rule I.—Suggestions to Guests. *These rules and regulations are designed to give you the maximum safety, comfort and health protection that a hotel or restaurant will reasonably permit. The management, however, must have your hearty assistance and coöperation to conduct this establishment in a satisfactory manner. You should use the property of the hotel or restaurant with the same care as if it were in your own homes. The use of washbowls in sleeping rooms for urinals; towels and bedding to shine shoes; expectorating on floors, walls or carpets; or other equally filthy practices should be strongly condemned by all persons who desire to improve living conditions in our hotels or restaurants.*

Rule II.—Construction. *Every hotel and restaurant in this state shall be conducted in every department in a manner most conducive to the protection of the health, comfort and safety of its guests, and it shall be constructed, equipped and maintained with efficient plumbing, ventilation and lighting, in accordance with standards prescribed by rules, regulations and orders issued in conformity to law.*

Rule III.—Lavatories and Toilets. *(a) All hotels in cities, towns and villages where a system of waterworks and sewers, adjacent to the property, is maintained for public use, shall on or before July 1, 1915, be equipped with suitable lavatories and toilet facilities for the accommodation of its guests. The sewer must be connected with the public sewer system.*

(b) All toilets, urinals, lavatories, bath tubs, sinks, and drains in hotels and restaurants shall be installed and maintained in conformity with the State Plumbing Code, issued by the State Board of Health.

(c) Each hotel shall be provided with a public washroom, which must be suppiled with clean individual towels as provided by law, also at least one public toilet for each fifteen sleeping rooms or fraction thereof, that are without toilets in addition to those provided with individual toilets.

(d) Every toilet room in hotels and restaurants shall be artifically lighted during the entire period that the building is occupied, wherever and whenever adequate natural light is not available, so that all parts of the room are easily visible.

Rule IV.—Outside Toilets. *(a) All hotels in cities, towns or villages not having a public sewer system or waterworks, shall have properly constructed privies, vaults or other sanitary devices, which shall always be kept clean, properly ventilated and well screened from insects and rodents.*

(b) The wall or partition between the apartments must be tight. A separate apartment, with separate entrance, properly designated and screened from public view, must be provided for each sex. All privy doors shall be self-closing.

(c) Where septic tanks are installed, they must be constructed in compliance with the state Plumbing Code.

NOTE. For location and construction of outside toilets, see State Plumbing Code, issued by the State Board of Health.

Rule V.—Kitchen. *(a) Every kitchen connected with a hotel, or restaurant shall be properly lighted and ventilated, so as to remove the gases and fumes caused by the preparation of foods.*

(b) Surfaces with open cracks on which food is prepared, or dishes are washed, shall be covered with zinc or other non-absorbent material.

(c) The floor, walls and ceiling must be kept clean and in good condition.

(d) All kitchen utensils in hotels and restaurants, shall be thoroughly cleaned after each meal, and when not in use shall be properly protected from all dirt, insects and rodents.

(e) No hotel or restaurant kitchen shall be used as a sleeping room, or a dressing room, for any employee, or other person.

(f) Water closets in any hotel or restaurant kitchen are prohibited.

(g) The use of tobacco by any employee, while on duty in hotel or restaurant kitchens, is strictly prohibited.

(h) No person suffering from any communicable disease shall be employed in any capacity in the kitchen or dining room of any hotel or restaurant.

(i) The State Board of Health declares the following as communicable diseases: Asiatic cholera (cholerine), yellow fever, smallpox, typhus fever, leprosy, bubonic plague, diphtheria, scarlet fever (scarlatina), typhoid fever, measles, including rotheln, whooping cough, cerebrospinal meningitis, acute anterior poliomyelitis, opthalmia neonatorum, gonorrhea, syphillis, tuberculosis, and other communicable skin diseases.

(j) Any person who has been afflicted with typhoid fever within three years shall not be employed in the dining room or kitchen of any hotel or restaurant until it has been definitely determined that such person is not a typhoid carrier.

(k) Every hotel or restaurant kitchen must be equipped with a suitable washroom or wash basins, soap, clean water and towels, and all employees, who in any way handle or come in contact with the foods to be prepared or served, must, before beginning work, after using toilets, and at all other times when necessary, wash their hands with clean water and soap.

Rule VI.—Foods. *(a) All places and receptacles where prepared food, or food served in its raw state, is kept or stored, must be mouse and rat proof, and be thoroughly screened against flies, cockroaches and other vermin.*

(b) Decayed, contaminated or unwholesome meats, vegetables or other food products, shall not be served in any hotel or restaurant, nor shall they be stored in any hotel or restaurant storeroom.

(c) All places where foods are prepared, or stored, shall be kept in a clean and sanitary condition.

(d) The drains from ice boxes and refrigerators must be properly trapped.

Rule VII.—Water and Ice. *(a) All water for drinking and culinary purposes in hotels and restaurants shall be free from contamination.*

(b) The use of contaminated, unwholesome or impure ice in drinks, or for cooling of food by direct contact, is prohibited in hotels and restaurants.

Rule VIII. Garbage. *(a) All garbage and kitchen refuse must be kept in water-tight metal cans provided with close fitting*

metal covers, unless otherwise protected from flies and other vermin, and the contents must be removed as often as necessary to prevent decomposition and overflow. The use of wooden containers is prohibited.

(b) Where garbage chutes or conveyors are used, they must be constructed so as to exclude from the building all odors arising from such garbage.

(c) No waste water (including dishwater) shall be discharged on or near the premises so as to create a nuisance.

Rule IX. Dining Room. *(a) The dining room, and all places where meals are served in hotels and restaurants shall be kept clean, well ventilated, heated, lighted and in a sanitary condition. This shall include the proper cleaning of the floor, ceiling, walls, tables, chairs, trays and all other dining room equipment.*

(b) The dining room shall be equipped with serviceable furniture.

(c) Table cloths and pads must be kept clean.

(d) Napkins, when provided, must be washed and ironed after being used by any guest.

(e) The use of dirty or cracked dishes or glassware in which food or drink is prepared or served, or dirty silverware in hotels and restaurants, is prohibited.

(f) All dishes, silverware, glasses, fingerbowls, and all other dining room utensils must be thoroughly cleaned after being used by any individual.

(g) Finger bowls, when used, must be filled with fresh, pure water for each guest.

Rule X. Sleeping Accommodations. *(a) Every sleeping room shall be of sufficient size to afford at least 400 cubic feet of air space for each occupant over twelve years of age, and 200 cubic feet for each occupant under twelve years of age. No greater number of occupants than thus established shall be permitted to sleep in any one room.*

(b) Sleeping rooms must be kept in good repair. The ceiling, walls and floor shall be free from dirt.

(c) No room shall be used for a sleeping room in any hotel heretofore constructed which does not have an adequate opening, other than a transom over the door, to the outside of the building, or to well-ventilated light wells, air shafts, courts or hallways. Light wells, air shafts and courts in such hotels must be

open at the top, or provided with approved ventilators to furnish proper ventilation.

NOTE. In rooms having an outside window or a window opening on a well-ventilated light well, air shaft or court, proper ventilation can be secured if the window is opened at top and bottom, and an adjustable shield is placed at the bottom to prevent drafts.

(d) At least one window in each sleeping room must be so constructed to permit it to be raised from the bottom or lowered from the top at any time. If storm windows are used, at least one for each sleeping room shall be either suspended from the top, or hinged from the sides, so that it can be opened and closed readily.

(e) Doors to sleeping rooms shall be provided with proper facilities for locking.

(f) Each room must be provided with at least one chair, two clothes hooks, and where an individual toilet is not available, with a chamber, and where running water is not supplied, must be furnished with clean wash-water pitcher, wash bowl, and slop jar.

(g) Clean individual towels must be supplied in all cases.

(h) All bedroom furnishing must be kept clean and free from odor, and each guest must be provided with clean wash-water, and upon request, with pure, wholesome drinking water.

(i) Rugs and carpets shall be kept clean and thoroughly renovated at least once a year, and oftener when deemed necessary by the Hotel Inspector.

NOTE. Rugs are recommended for use in sleeping rooms in place of carpets.

(j) Where sleeping and dressing rooms are provided for employees, they shall be properly lighted, heated, ventilated and kept clean.

(k) All hotels not equipped with all night illumination, must provide each sleeping room with a serviceable lamp, or candle, and matches.

NOTE. For rules regulating artificial lighting of new buildings, see State Building Code, issued by the State Industrial Commission.

For lighting of hallways and exits of old buildings, see general orders of Industrial Commission.

Rule XI. Bedding. *(a) All hotels shall hereafter provide each bed, bunk, cot or other sleeping place for the use of transient guests with white cotton or linen pillow slips, top and under sheets, also mattress, and a reasonably sufficient quantity of bedding.*

(b) The under sheet to be of sufficient size to completely cover the mattress and fold under on sides and ends.

(c) The top sheet must be at least of equal width, and, on and after January 1st, 1915, it must be not less than 96 inches long, after being laundered.

(d) The long top sheet is to be folded back at the head of the bed so as to cover all top coverings, at least twelve inches.

(e) All bedding, including mattresses, quilts, blankets, pillows, sheets and comforts used in any hotel, must be thoroughly aired and kept clean. No bedding shall be used which is worn out and unfit for further use. Pillow slips and sheets must be washed and ironed as often as they shall be assigned to a different guest.

NOTE. Bed quilts are difficult to wash, and keep clean, and with the best of care they cannot be kept in proper condition. When they become worn they are especially objectionable. All bed covers should be made of washable material. Washable blankets and bed spreads should whenever possible, be substituted for quilts. Such changes are earnestly recommended.

Rule XII. Communicable Diseases. *Whenever a room in any hotel has been occupied by a guest ill with a communicable disease, it shall be thoroughly fumigated and disinfected in accordance with the rules of the State Board of Health, before being occupied by another guest.*

Rule XIII. Sample Display Rooms. *All sample display rooms shall be kept clean, and provided with sufficient light, heat and ventilation.*

Rule XIV. Screens. *(a) All windows, doors and other unprotected openings to the outside of the building, in kitchens, dining rooms, cellars and public offices of every hotel and restaurant, must be properly screened against flies and other insects.*

(b) All sleeping rooms in every hotel having a window opening to the outside of the building, must be provided with a suitable screen and in rooms having more than one window, screens shall be provided for at least two windows in every such room.

Rule XV. Premises. *All premises connected with, or used by, any hotel or restaurant, shall be kept in a sanitary condition,*

and it shall be the duty of the Local Health Officer, either upon his own initiative, or upon the complaint of any citizen, Deputy State Health Officer, or Hotel Inspector, to take such action as may be necessary to abate any nuisance, source of filth, or cause of sickness, existing on the premises as required by section 1414 of the statutes.

Rule XVI. Fire Escapes and New Buildings. *For the construction of new buildings and fire escapes, consult the State Building Code, issued by the Industrial Commission.*

Rule XVII. General Provisions. *(a) In all hotels and restaurants where bubbling fountains are not installed, clean drinking cups or glasses shall be provided for each guest upon request.*

(b) Chapter 274, Laws of 1913, makes it unlawful for any person, firm or corporation to sweep, or permit sweeping in hotels, restaurants and other public places where the public is invited, unless the floor is first sprinkled with water, moist sawdust or other substance to prevent the raising of dust. When vacuum cleaners, or properly filled reservoir dustless brushes are used, the sprinkling or use of moist sawdust is not required.

(c) All floors and interior woodwork in hotels and restaurants shall be cleaned as often as may be necessary to keep them in a sanitary condition.

(d) All cuspidors, wherever used, must be cleaned daily and kept free from odor.

Rule XVIII. Permits. *The hotel or restaurant permit and at least one copy of the official rules and regulations governing the sanitary and safe conditions of hotels and restaurants shall be conspicuously displayed in each hotel and restaurant.*

Penalty. *Chapter 648, Laws of 1913, provides that any person, firm or corporation, owning, leasing, managing or conducting any hotel or restaurant in violation of any of the provisions of this section, or in violation of any rule or regulation of the State Board of Health, shall be deemed guilty of a misdemeanor and upon conviction thereof shall be punished by a fine of not less than twenty-five, nor more than two hundred dollars; and any person, firm or corporation conducting a hotel or restaurant in violation of any order of the State Board of Health, after such order shall have been served upon, or directed to such person, firm or corporation, shall be deemed guilty of a misdemeanor and upon conviction thereof shall forfeit five dollars for each and every day for such non-compliance with such order;*

provided, that if any action to modify or set aside such order shall have been commenced pursuant to subsection 7 of this section, such forfeiture shall not be exacted, or commence to run until after the lapse of a reasonable time, after the termination of said proceeding.

The method of procedure in the issuing of licenses for master and journeyman plumbers, who failed to become licensed under the waiver provision was next discussed. The State Health Officer informed the members that a considerable number of applications for licensing, under the waiver act, are being made, and in view of the opinion on this point by the Attorney-General, the following resolution was adopted:

"*Resolved*, That the State Health Officer be, and he is hereby directed to issue no license *without examination* to master or journeyman plumbers who may hereafter apply for such licenses, provided this shall not include licenses obtained by reciprocity with other states."

Dr. C. H. Sutherland then presented the following Resolution:

"*Resolved*, That the State Health Officer be requested to furnish each member of the Board with a complete record of the minutes of all regular and special meetings as soon as possible after the date of the meeting."

This motion was seconded and carried.

The following Resolution was adopted relating to the use of solidified formaldehyde for fumigation.

"*Be it Resolved by the State Board of Health*, That on account of the large amount of inferior solidified formaldehyde now upon the markets for fumigating purposes in Wisconsin, that the sale or use of "Solidified Formaldehyde" in Wisconsin, shall be prohibited unless there is printed on the package, information showing:

First: The actual amount of formaldehyde contained in the product.

Second: The amount of this product which is required to properly disinfect 1,000 cubic feet of air space, and

Third: The condition of the room required with reference to heat and moisture.

Be it Further Resolved: That if this information is given on the packages and it is shown from the tests made in our laboratory that the material meets the standard as claimed for it, such product will be accepted for fumigating purposes."

The Board next discussed its relations with and the work of the State Laboratory of Hygiene and carefully considered ways and means by which the laboratory could be of more service to

the people of the state and greater assistance to the State Board of Health in its work of conserving the life and health of the people of the state, as well as its better utilization by the University under proper restrictions. The following resolution was introduced by Dr. Otto Fiedler:

"*Resolved*, That unless arrangements entirely satisfactory to the State Board of Health for its use, of the present State Laboratory of Hygiene at the State University can be made, the State Health Officer is hereby empowered and directed to make the necessary arrangements for an entirely separate laboratory to be operated under the direct control and supervision of the State Board of Health, the Laboratory to be known as the State Board of Health Laboratory."

Motion was made and seconded that this Resolution be adopted. Carried.

JUNE MEETING, 1914.

Dr. M. P. Ravenel, the Director of the State Laboratory of Hygiene, presented for the consideration of the Board the following report, covering the work of the State Laboratory of Hygiene for the fiscal year from July 1, 1913 to June 30, 1914.

July 1913.	
Diphtheria	80
Typhoid	120
Sputum	256
Water	150
Rabies	4
Miscellaneous	58
Not examined	12
Total	680

August 1913.	
Diphtheria	89
Typhoid	105
Sputum	230
Water	95
Rabies	4
Miscellaneous	123
Not examined	9
Sewage	205
Total	860

September 1913.	
Diphtheria	93
Typhoid	96
Sputum	195
Water	102
Rabies	5
Miscellaneous	176
Not examined	8
Sewage	59
Total	734

October 1913.	
Diphtheria	122
Typhoid	78
Sputum	204
Water	80
Rabies	5
Miscellaneous	57
Not examined	6
Total	552

November 1913.	
Diphtheria	119
Typhoid	88
Sputum	187
Water	49
Rabies	4
Miscellaneous	103
Not examined	10
Sewage	40
Total	600

December 1913.	
Diphtheria	115
Typhoid	63
Sputum	231
Water	72
Rabies	1
Miscellaneous	102
Not examined	15
Total	599

January 1914.	
Diphtheria	150
Typhoid	48
Sputum	321
Water	37
Rabies	1
Miscellaneous	115
Not examined	10
Total	682

February 1914.	
Diphtheria	130
Typhoid	46
Sputum	257
Water	46
Rabies	3
Miscellaneous	91
Not examined	7
Total	580

March 1914.	
Diphtheria	204
Typhoid	74
Sputum	325
Water	52
Rabies	6
Miscellaneous	258
Not examined	8
Total	927

April 1914.	
Diphtheria	314
Typhoid	71
Sputum	319
Water	69
Rabies	4
Miscellaneous	114
Not examined	15
Total	906

May 1914.	
Diphtheria	207
Typhoid	99
Sputum	313
Water	82
Rabies	7
Miscellaneous	75
Not examined	20
Total	803

June 1914.	
Diphtheria	106
Typhoid	99
Sputum	284
Water	55
Rabies	11
Miscellaneous	134
Not examined	12
Sewage	43
Total	744

SUMMARY.

July 1, 1913—July 1, 1914.	
Diphtheria	1729
Typhoid	987
Sputum	3122
Rabies	55
Water	889
Miscellaneous	1710
Not examined	132
Sewage	347
Total	8971
Number of doctors and health officers on record	1,814
Total number of doses of anti-typhoid vaccine which have been sent out by the laboratory	13,585

The Board next considered the revision of the rules previously adopted for the transportation of the dead. The State Health Officer explained to the members present that the reason for changing the rules at this time was to comply with the statutory provisions, requiring that the rules and regulations adopted by the State Board of Health for the transportation of the dead shall conform with the rules adopted and approved by the Con-

ference of State and Provincial Boards of Health, the National Funeral Directors' Association and the American Association of General Baggage Agents. The State Health Officer then read the proposed uniform rules adopted by the Conference of State and Provincial Boards of Health in June, 1913 and which were approved by the National Funeral Directors' Association in October, 1913.

After careful consideration of the proposed rules, it was agreed that Rule 2 should be amended so as to bring bodies dead from erysipelas, anthrax and glanders under its provisions.

Upon motion, which was duly seconded and carried, erysipelas, anthrax and glanders were included in the list of diseases under Rule 2.

It was moved that the rules presented, as amended, be adopted. Seconded and carried. The rules were then ordered published in the official state paper so as to give them the full force of law.

The following is a list of the revised rules.

RULES OF THE WISCONSIN STATE BOARD OF HEALTH FOR THE TRANSPORTATION OF THE DEAD.

Adopted by the State Board of Health on October 14, 1914, and Published in the Official State Paper on October 20, 1914.

These rules apply equally to all common carriers and having been duly adopted and properly published have the full force of law.

To comply with Section 4608A, Chapter 57, Laws of 1907, and Chapter 32, Laws of 1909, The State Board of Health adopts the following Rules for the Transportation of the Dead. These Regulations are also the Rules of the American Association of General Baggage Agents, The National Funeral Directors' Association and the Conference of the State and Provincial Boards of Health.

Rule 1—*A transit permit and transit label issued by the proper health authorities shall be required for each dead body transported by common carrier.*

The transit permit shall state the name, sex, color and age of the deceased, the cause and date of death, the initial and terminal points, the date and route of shipment, a statement as to the method of preparation of the body, the date of issuance, the signature of the undertaker, the signature and the official title of the officer issuing the permit.

The transit label shall state the place and date of death, the name of the deceased, the name of the escort or consignee, the initial and terminal points, the date of issuance, the signature and official title of the officer issuing the permit shall be attached to the outside case.

Rule 2—*The transportation of bodies dead of smallpox, plague, Asiatic cholera, typhus fever, diphtheria (membranous*

croup, diphtheretic sore throat) scarlet fever (scarlet rash, scarlatina), erysipelas, anthrax and glanders, shall be permitted only under the following conditions:

The body shall be thoroughly embalmed with an approved disinfectant fluid, all orifices shall be closed with absorbent cotton, the body shall be washed with the disinfectant fluid, enveloped in a sheet saturated with the same, and placed at once in the coffin or casket which shall be immediately closed, and the coffin or casket, or the outside case containing the same shall be metal or metal lined, and hermetically and permanently sealed.

Rule 3—*The transportation of bodies dead of any diseases other than those mentioned in RULE 2 shall be permitted under the following conditions:*

(A) When the destination can be reached within twenty-four hours after death, the coffin or casket shall be encased in a strong outer box made of good sound lumber not less than seven-eighths of an inch thick, all joints must be tongued and groved, top and bottom, put on with cleats or cross pieces, all put securely together, and be tightly closed with white lead, asphalt varnish or paraffin paint, and a rubber gasket placed on the upper edge between the lid and box.

(B) When the destination cannot be reached within twenty-four hours after death, the body shall be thoroughly embalmed and the coffin or casket placed in an outside case constructed as provided in paragraph (A).

Rule 4—*No disinterred body dead from any disease or causes shall be transported by common carrier, unless approved by the health authorities having jurisdiction at the place of disinterment, and transit permit and transit label shall be required as provided in RULE 1.*

The disinterment and transportation of bodies dead of diseases mentioned in RULE 2 shall not be allowed except by special permission of the health authorities at both places of disinterment and the point of destination.

All disinterred remains shall be enclosed in metal or metal-lined boxes and hermetically sealed, providing that bodies in a receiving vault when prepared by licensed embalmer shall not be regarded as disinterred bodies until after the expiration of thirty days.

Rule 5—*The outside case may be omitted in all instances when the coffin or casket is transported in hearse or undertaker's wagon.*

Rule 6—*Every outside case shall bear at least four handles, and when over five feet six inches in length, shall bear six handles.*

Rule 7—*An approved disinfectant fluid shall contain not less than 5 per cent of formaldehyde gas, the term "embalming" as employed in these rules shall require the injection by licensed embalmers of not less than 10 per cent of the body weight, injected arterially in addition to cavity injection, and twelve hours shall elapse between the time of embalming and the shipment of the body.*

Rule 8—*The attached form of death certificate, health officers' permit, and label as described herein, with these rules printed thereon, shall be used in this State for the shipment of bodies as herein provided.*

Rule 9—Penalty. *Section 1409—8 of the Statutes provides that "any person who shall be guilty of the violation of any of the provisions of this act, or who shall violate any rule or regulation prescribed by said board, for the preparation, embalming, shipping, or burial of any dead human body, shall be guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not less than ten dollars nor more than fifty dollars or imprisonment in the county jail not less than ten days nor more than sixty days."*

Upon motion which was seconded and carried, it was voted that each Deputy State Health Officer be required to make a comprehensive sanitary survey of one or more municipal health units in his territory each year, the number of districts or municipal health units included in the survey to be determined by the State Health officer. At least enough municipal health units be surveyed to be the equivalent of at least one county for each year. The Board also advised the State Health Officer to notify the local health officers in whose districts the surveys are being made, that we shall expect hearty coöperation from them in making the survey as complete and valuable as possible.

The question of proper diagnosis in cases of chicken pox was discussed at length. The Board recommended that every case of chicken pox in an adult be treated as smallpox.

Upon motion, which was seconded and carried, the salary of the Chief Plumbing Inspector, Mr. Frank R. King, of Madison, was raised from $150.00 per month to $187.50.

A letter was read from Mrs. Wiltrout, of Chippewa Falls, in

which she asks the Board to consider the advisability of establishing a branch laboratory in that city, to be operated by the State Board of Health in connection with the Associated Charities.

Upon motion, which was seconded and carried, the State Health Officer was requested to make a personal investigation of this question and to report to the Board at the next meeting.

The State Health Officer announced to the members that the Committee for the Examination of Registered Nurses has made a careful examination of the Klaes Hospital and also the Good Samaritan Hospital of Milwaukee, and it was the recommendation of the Committee that the registration of nurses from either of these institutions, under the waiver act, should be refused. The action of the Committee was approved.

The members were informed that the Alexander Antitoxin Company, of Marietta, Pa., has asked the Board to keep on hand a small supply of smallpox vaccine and tetanus antitoxin for distributing direct to the physicians of the state upon request. The Alexander Company agrees to furnish the material at greatly reduced prices and to collect all money due for any of this material sent out.

The Board approved of the action of the State Health Officer in making these arrangements.

EXPENDITURES OF THE STATE BOARD OF HEALTH AND BUREAU OF VITAL STATISTICS.

From July 1, 1912 to June 30, 1913.

Month.	Salaries.	Official exp.	Per diem.	Miscellaneous.	Printing.
July	$997.38			$15.97	
August	980.83	$111.16		14.96	
September	980.84	86.72		25.84	$179.61
October	980.84	218.58		39.72	
November	935.82	130.76		26.54	
December	894.24	40.31		5.23	
January	932.71	103.22		59.72	
February	953.36	115.60	$30.00	44.17	
March	910.57	78.78		45.77	
April	905.83	44.09		22.02	
May	910.83	123.35	10.00	25.03	
June	910.84	111.59	20.00	49.35	
Total	$11,294.09	$1,165.16	$60.00	$374.32	$179.61
Grand total disbursed by voucher					$13,073.18

For statement of expenditures, other than those paid by voucher issued by the State Board of Health, see report of Secretary of State.

EXPENDITURES OF THE STATE BOARD OF HEALTH AND BUREAU OF VITAL STATISTICS.

From July 1, 1913 to June 30, 1914.

Month.	Salaries.	Official exp.	Per diem.	Miscellaneous.	Silver nitrate.
July	$935.83	$111.94	$10.00	$118.64	.....
August	1,009.91	79.23	.....	35.72	.....
September	1,034.17	343.36	.....	7.59	.....
October	1,270.67	163.44	.....	39.69	.....
November	1,740.76	143.74	140.00	23.66	.....
December	1,654.16	148.30	.....	.....	.....
January	1,654.18	254.27	10.00	19.00	$525.00
February	1,851.67	167.99	.....	.....	.....
March	1,905.23	254.86	10.00	9.00	525.00
April	1,867.42	245.58	50.00	27.10	245.07
May	1,897.12	292.89	20.00	19.60	.....
June	1,851.67	243.66	.....	.....	.....
Total	$18,672.79	$2,449.26	$240.00	$300.00	$1,295.07
Grand total disbursed by voucher					$22,957.12

For statement of expenditures, other than those paid by voucher issued by the State Board of Health, see report of Secretary of State.

EMBALMERS.

For the calendar year ending December 31st, 1912, fifty-two applicants were examined. Of this number eight failed to pass the examination and as a result a license was not granted. Eleven licenses were issued on reciprocity relations with other states.

For the year ending December 31st, 1912, there were 957 embalmers in the state holding licenses issued by the State Board of Health.

FINANCIAL STATEMENT.

On January 1st, 1912, there was in the treasury to the credit of the Embalmers' Fund $1,989.44. During the year the receipts amounted to $1,199.00.

The disbursements during the year were, as follows:

Printing and stationery	$192 77
Postage	77 00
Dues, Embalmers' Examining Boards of N. A.	10 00
C. A. Harper, Secretary, official expenses and services	828 13
A. A. Walter, clerical services	60 00
Dr. C. H. Stoddard, M. D., assisting at Embalmer's examination	15 00
J. R. McLain, services Embalmers' examination	10 00
Chas. R. Fiss, services Embalmers' examination	10 00
F. H. Pratt, services Embalmers' examination	10 00
C. E. Judson, Cadaver for Embalmers' examination	25 00
Total	$1,273 90

For the calendar year ending December 31st, 1913, sixty-three applicants were examined. Of this number sixteen failed to pass the examination and as a result a license was not granted. Seven licenses were issued on reciprocity relations.

For the year ending December 31st, 1913 there were 982 embalmers in the state holding licenses issued by the State Board of Health.

FINANCIAL STATEMENT.

On January 1st, 1913, there was in the treasury to the credit of the Embalmers' fund $1,950.54. During the year the receipts amounted to $1,263.00.

The disbursements during the year were as follows:

Printing	$141 25
Stationery	8 35
Postage	55 00
A. M. Ragsdale, Treas. N. A. Conference Embalmers' Examination Board	15 00
C. A. Harper, M. D., State Health Officer, official expenses and services	685 13
A. A. Walter, clerical services	40 00
Wm. F. Whyte, M. D. services Embalmers' examination	30 00
C. H. Sutherland, M. D., services Embalmers' examination	19 69
D. Brettschneider, services Embalmers' examination	10 00
C. J. Gibson, services Embalmers' association	10 00
C. R. Fiss, services Embalmers' examination	10 00
C. E. Judson, services Embalmers' examination	10 00
By Secretary of State for stationery	12 92
Total	$1,047 34

NURSE REGISTRATION.

On March 3rd, 1903 in the State of North Carolina the first law authorizing the registration of nurses, and prescribing standards for training schools was enacted. A few days later New Jersey passed a similar bill and on April 27th, 1903 the New York legislature passed a bill giving to the Board of Regents of the State University the power to appoint a board of nurse examiners, and the right to fix the requirements of the schools whose nurses might be registered.

Maryland, California, Colorado, Iowa, Minnesota, Illinois, Georgia, Washington, Michigan and other states followed until thirty three laws bearing upon state registration for nurses had been enacted. Still Wisconsin had no such law. Hospitals and sanitariums were increasing rapidly with no means of securing anything which approached adequate or uniform training for

the pupil nurses in them, or to provide for the people, at large, competent graduate nurses. In the year 1911, the Wisconsin legislature passed a law fixing the requirements for registration of nurses. This law provided for the appointment, by the State Board of Health, of a committee of examiners, five in number, from the nursing profession who with the advice of the State Board of Health should pass upon the qualifications of applicants for registration, and assist in the establishing of better courses of study in the Wisconsin schools for nurses. In order to place the law on a working basis it was necessary to recognize the nurses who were already graduated. Hence the law provided that all nurses making application previous to September 1st, 1914, who had been graduated from a school in connection with a general or special hospital, which at the time of their graduation provided a course of at least two years training in such training school, should without examination receive from the state a certificate of registration. This period is known as the term of waiver, the law also provides under the term of waiver, that is until September 1st, 1914, that nurses who at the time of their application had practiced nursing for three years although they had not graduated from any training school, might upon satisfactorily passing an examination before the Committee of Examiners, receive certificates of registration. Under the first provision, without examination, previous to July 1st, 1914, eight hundred and fifty-one nurses were registered, and forty-five applicants were rejected.

Under the second provision five examinations were held, previous to July 1st, 1914. There were in all twenty-five applicants, seventeen of whom upon examination were granted certificates of registration. Four of the twenty-five had had four or five years of hospital service, twelve had had eight to ten years of hospital experience, six had had from one to two years of hospital service and three had had only practical work. The law fixed some of the important requirements with regard to the training schools, whose nurses after September 1st, 1914 might make application for registration. All applicants must be graduates of schools giving a three years training, or having had two years in an approved general or special hospital supplement their work by one or more years in a general hospital, wherein instruction not obtained in the other institution is given. A course of study, outlined by the Committee of Examiners, has been sent to all the

Wisconsin schools for nurses as suggestive of the work that it is hoped may be accomplished by them.

Illinois and Minnesota have agreed with Wisconsin upon equal reciprocity relations in regard to the registration of nurses, and other states have asked for the same provision.

The Committee of Examiners for the registration of nurses is composed of the following members:—

Anna Dastych, President.....La Crosse.
Anna J. Haswell, Secretary.....Madison.
Ella F. McGovern.....Milwaukee.
Gertrude I. McKee.....Milwaukee.
Mary Stoeber.....Madison.

FINANCIAL REPORT OF REGISTRATION OF NURSES

From March 1st, 1912 to June 30, 1913.

Receipts		$5,040 00
Disbursements by voucher	$1,362 41	
Fees returned	420 00	
Total	$1,782 41	
*Balance cash on hand June 30, 1913	3,257 59	
		$5,040 00

FINANCIAL REPORT OF REGISTRATION OF NURSES

From July 1st, 1913 to June 30, 1914.

*Balance cash on hand June 30, 1913		$3,257 59
Receipts		3,970 00
Total		$7,227 59
Disbursements by voucher	$1,090 05	
Fees returned	160 00	
Printing, stationery and postage, per statement as paid by Secretary of State	307 42	
Total	$1,557 47	
Balance cash on hand June 30, 1914	5,670 12	
		$7,227 59

*July 1913 vouchers were paid by check before money was turned over to the State Treasurer, and therefore total of July vouchers, namely $146.69, was not included in receipts for fiscal year with deposit to State Treasurer, neither were disbursements amounting to $146.69 for July included with disbursements made by State Treasurer.

1. To license and inspect hotels and restaurants.

REPORT OF THE HOTEL AND RESTAURANT INSPECTION DIVISION FROM JANUARY 1st, 1914, to JUNE 30th, 1914.

WALTER G. MASE, State Hotel Inspector,
E. U. F. LOETHER, State Hotel Inspector,
ERNEST J. BROWN, Chief Clerk.

Chapter 648, Laws of 1913, which became effective January 1st, 1914, gives the State Board of Health power and jurisdiction as follows:—

1. To license and inspect hotels and restaurants.

2. To formulate rules and regulations which shall set the standard of sanitation and safety required in all hotels and restaurants in the State.

3. To administer and enforce the laws relating to public health, safety and sanitation in hotels and restaurants.

4. To investigate, ascertain, declare and prescribe what alterations, improvements or other means or methods are reasonably necessary for the protection of the public health in hotels and restaurants.

5. To ascertain and fix such reasonable standards and to prescribe, modify and enforce such reasonable orders for the adoption of improvements and other means or methods, to be as nearly uniform as possible, as may be necessary to carry out all laws and lawful orders relative to the protection of the public health and safety in hotels and restaurants.

Practically the first three months were devoted to the organization of the Department. Such places as were known to need immediate attention were visited and inspected. From the information thereby obtained, rules governing the sanitary and safe condition of hotels and restaurants in the state were drawn up in tentative form and distributed generally throughout the state to the hotel and restaurant proprietors and, as far as pos-

sible, to all other parties interested, with a request for recommendations. After due consideration of the many recommendations received, the rules were finally adopted and published in the official state paper, on April 7th, 1914. These adopted rules, which have the full force of law, have met with the general approval of the hotel and restaurant proprietors and the traveling public.

Nothing of a radical nature was attempted in formulating the hotel and restaurant rules; neither has it since been found necessary. With a few exceptions the articles necessary to obtain the desired results are soap and water, calcimine and paint,—also a little time in which to apply them.

From the inspection reports filed in this office, the proper disposal of garbage would seem to be one of the greatest problems confronting us. Very few of the hotels and restaurants have adequate facilities for properly caring for and removing the waste products from their places of business. In many instances leaky barrels or boxes are used which, from a sanitary standpoint, are absolutely useless. The rules and regulations adopted by this Board require a metal receptacle with tightly fitting cover, the contents of which must be removed as often as necessary to prevent decomposition and overflow. We feel sure that at no place where a proper receptacle has been installed, by orders from this office or by an inspector while on the ground, would the proprietor be without one again, for he can see plainly the advantage to his place of business.

The average kitchen, both in hotels and restaurants, is usually the main cause for complaint. Too often it shows signs of neglect. Frequently system, of prime importance in the kitchen, is lacking. In many cases articles are left where last used, instead of being returned to their proper places. For instance, pans, etc., used for cooking purposes are too often left on the range to gather dust and form a resting place for numerous flies, and other insects; dishes, after being used, are allowed to stand on the tables until the next meal; knives, forks, spoons, etc., are left lying around; food is allowed to stand where it can be reached easily by rats, mice, roaches, flies and dust. The floor is often dirty, especially under the tables, in the corners and around the plumbing; it is wet and rotten and often the source of disagreeable odors. The proprietors know that these condi-

tions are not sanitary, yet often neglect them and ultimately cause the owner of the building great expense for repairs.

It must not be assumed from these unfavorable and general comments that all places are in this category, for many of the proprietors take great pleasure in keeping their kitchens strictly clean, sanitary and orderly.

While it is impossible to describe in this brief report just how a model kitchen should look, yet it is agreed generally that it should be clean and reasonably sanitary, for it is here that the food which nourishes the body is prepared. Since the kitchen is a part of hotels and restaurants, of which those who travel see very little, too often it is found in a very insanitary and unsatisfactory condition.

No part of hotels is observed more by the traveling public than the sleeping rooms. Too frequently they are found to be poorly lighted and ventilated; the ceiling and walls dirty; the carpets filthy; the bedding unclean and badly worn. Such conditions are far from being conducive to the health and comfort of the occupants. It is a known fact that paper on the ceilings and walls frequently becomes loose and furnishes harboring places for disease germs and bedbugs. This Board recommends that the ceilings and walls in sleeping rooms either be painted or calcimined, instead of papered; and, in cases where the floors are covered with old and filthy carpets, that the carpets be taken up, the floors painted and rugs provided. Too much attention cannot be given to the bedding. It must be thoroughly aired from time to time and kept clean. No bedding must be used which is worn out and unfit for further use. Pillow slips and sheets must be washed and ironed as often as they are assigned to a different guest. All bed covers should be made of washable material. Washable blankets and bedspreads whenever possible, should be substituted for quilts. The rules and regulations require the under sheet to be of sufficient size to cover completely the mattress and fold under on sides and ends. The top sheet must be of at least equal width, and on and after January 1st, 1915, it must be not less than 96 inches long after being laundered. It has been found that only a few hotels, comparatively speaking, now have sheets that will fulfill the requirements in effect after January 1st, 1915.

Toilets are also another very frequent cause for complaint on the part of guests. They are frequently found insanitary owing

to their general uncleanliness and lack of proper lighting and ventilation. In many cases the odor has become so offensive that it is objectionable to guests in other parts of the building. Investigation has disclosed the fact that in most cases insanitary toilets are due to lack of system in caring for them. All parts of the toilets should be kept clean and free from objectionable odors at all times, a condition easily secured if they receive daily attention.

A large percentage of the hotels and restaurants in Wisconsin are conducted in buildings which are either leased or rented. In many instances the proprietor of the business has been trying for a considerable time to get certain sanitary improvements installed. It may be a toilet instead of a privy; a new sink in the kitchen; certain walls calcimined or papered; or something of that nature; and, although it is plainly evident that these improvements are needed from the standpoint of health and safety, the owner of the building apparently has no end in view other than to get what rent he can out of the building; and then, at the time most favorable to him, trade or sell it.

These conditions make it very hard for the proprietor who is trying to run a reasonably clean and sanitary place of business.

The rules and regulations adopted by this Board make the property owner responsible for his share of the improvements, and thus a great deal of good is being done both for the traveling public and the proprietor of the business; and it might be mentioned that considerable improvements and renovations have been made voluntarily by the property owners and proprietors of various hotels and restaurants, owing entirely to the passage of this law.

A clean ice box is very important if wholesome food is to be provided. A large number of those inspected showed plainly signs of neglect, a strong unpleasant odor often greeting one upon opening the door. Conditions such as this cannot be tolerated if the health of the public is to be guarded.

FORM 704--12-10-14—4M

WISCONSIN STATE BOARD OF HEALTH

REPORT OF HOTEL AND RESTAURANT INSPECTION

HOTEL RESTAURANT PROPRIETOR

INSPECTED WISCONSIN

PLAN

RATE PER DAY

P | L/B

POSTED PERMIT | POSTED RULES

Building	**A**	**Frame** 1	Brick 2	Other Material 3	Roof 4	Owner 5	Condition 6	Fire Protection 7	Stories 8	Total Bedrooms 9	No. Trans. 10 Rooms		
Office	**B**	Walls 11	Ceiling 12	Floor 13	Light 14	Ventilation 15	Furniture 16	Baggage 17	Cuspidors 18	Saloon 19	Public Drinking Cup 20		
Dining Room	**C**	Walls 21	Ceiling 22	Floor 23	Light 24	Ventilation 25	Pads and Linen 26	Dishes 27	Silverware 28	Glassware 29	Furniture 30		
Kitchen	**D**	Walls 31	Ceiling 32	Floor 33	Light 34	Ventilation 35	Sink 36	Cooking Utensils 37	Storing Utensils 38	Surface Cracks 39	Towels 40		
		Dishes 41	Pests 42	Garbage 43	Condition of Help 44	Range 45	Iceboxes 46	Food Storage 47	Woodwork 48	Help Toilet 49	Washbowls 50		
Halls	**E**	Walls 51	Ceiling 52	Floor 53	Light 54	Ventilation 55	Carpets 56	Fire Lights 57	Stairways 58	Woodwork 59	Obstructions 60		
Bedrooms	**F**	Walls 61	Ceiling 62	Floor 63	Light 64	Ventilation 65	Sheets 66	Rugs Carpets 67	Beds Bedding 68	Pests 69	Help Quarters 70		
Toilets	**G**	Walls 71	Ceiling 72	Floor 73	Light 74	Ventilation 75	Towels 76	Wash Basins 77	Bathtubs 78	Closet Seats 79	Closet Bowls 80		
		Urinals 81	Public Waterworks 82	Public Sewer 83	Private Waterworks 84	Private Sewer 85	Sufficient 86	**Privies** 87 **H**	Screened 88	Doors 89	Cleanliness 90		
General	**J**	Premises 91	Storm Windows 92	Screens 93	Heat 94	Plumbing 95	Cuspidors 96	Parlor 97	Sample Rooms 98	Sweeping 99	Cellar 100		

The form found herewith is being used for inspections, and shows what particular items are inspected in each hotel. Each particular hotel also has problems of its own, which are treated in the lined space on the lower half of the form. On the lower portion also are shown the numbers of the squares above which need attention, present conditions and alterations necessary to make the building and business safe and sanitary.

Following are a few reports of places below the average, together with extracts from the correspondence:—

HOTEL

"Construction—Brick and frame; heated with steam; lighted with electricity.

"Toilet and Wash Room—In basement unsatisfactory. Stairs leading from office too narrow; steps worn and matting filthy. Floor under urinal decayed, unsafe, filthy; odor very offensive, plumbing out of commission. Two stalls. Floor under bowls decayed, unsafe, filthy. Odor offensive. Wash Bowl: Plumbing out of commission. Mop board decayed. Ceiling and walls dirty. Roller and individual towels in use.

"Cellar—Filthy, no ventilation. Floor insanitary. Ceiling covered with cobwebs, filthy. Heating plant in fair condition.

"Dining Room—Two departments. Ceiling papered; filthy; paper peeling off. Walls and paper dirty. Floor very old; nearly worn through in places; cracked. Linen and silver satisfactory.

"Office—Ceiling metal and paper. Dirty. Walls and paper dirty. Floor part hardwood. Fair. Floor part linoleum. Unsatisfactory. Fireplace needs cleaning.

"Cloak Room—Ceiling and walls insanitary. Linoleum on floor filthy. Very poorly ventilated and lighted; no openings other than the door.

"Kitchen—Very low ceiling. Poorly lighted and ventilated. Part of plaster fallen off; insanitary. Walls filthy. Electric wiring unsafe. Floor sagging; uneven throughout. Ceiling in cooking department filthy. Range and cooking utensils fair. Gas escaping from gas range. This kitchen a fire trap.

"Garbage—Kept in metal cans.

"Store Room—Poorly ventilated and lighted. Ceiling and walls filthy. A thorough cleaning needed.

"Sleeping Rooms for Help—On second floor over kitchen. Ceiling and walls filthy. Floor unsafe. Furniture and bedding clean. Regular fire trap.

"Sleeping Rooms 2nd Floor—Eleven—for transients. Ceilings and walls filthy. Carpets old but clean with exception of three or four rooms. Wood and iron beds clean. Bedding satisfactory. Furniture fair. Ceilings and walls need repapering.

"**Sleeping Rooms 3rd Floor**—Nine—for transients. Most of the partitions are boards. Ceilings and walls insanitary. Carpets old. Wood and iron beds clean. Bedding clean. Furniture fair.

"**Ice Box**—Old. Back of it insanitary. Surroundings insanitary.

"**Toilet for Kitchen Help**—Filthy. No ventilation other than through door.

"**Toilet on 2nd Floor**—Is used by guests on second and third floors.

"**Halls**—On each floor are unsatisfactory.

"**Fire Escapes**—On each floor are unsatisfactory.

"This place is not satisfactory.

"Most parts are insanitary.

"The old frame part of the hotel I consider a regular fire trap; also the rooms and halls on third floor.

"Before it can be made safe and sanitary, it will be necessary to remodel all parts.

"The proprietor is doing the best he can to care for his guests under the existing, unfavorable and insanitary conditions.

"Orders containing the necessary instructions to bring this building up to the proper standard were issued on the owners of the building.

On June 3rd, we received a letter in reference to these orders which reads as follows:—

"The writer has just this week returned from an absence of three weeks and finds your letter with copy of inspector's report. Mr. ——, who with myself owns the property has been away of late and it seems neither of us was in the city at the time your inspector was here.

We are very much surprised at the tone of your letter. We have realized that the Hotel needed repairs and have been deterred from making them only by time consumed in investigating and considering a new Hotel. We are both rather busy along other lines and have left the consideration of this matter to such times as suited our convenience. We have not paid much attention to the property because it was capably tenanted and well managed and we trusted the occupant of the Hotel to keep its sanitary conditions right.

In reading the report of your inspector we cannot help but feel that there is an undue severity in the criticisms. Still we agree in the main as to the conditions and we hope in a few days to determine finally on rebuilding addition or repairs, and will get to the matter just as soon as we can.

We thank you for your interest in the matter and assure you that neither of us have any desire to delay changes bringing about conditions that should maintain in a building for this purpose. When your inspector is near here again we would appreciate talking with him and getting his views as to just what would be required of us to meet his criticisms on some of the changes."

On June 8th, we replied to this letter which reads as follows:—

"Your communication in re the Hotel is before us for consideration, and we appreciate your willingness to put the building used as a hotel

in such condition as will comply with the sanitary rules and regulations of this Board.

Many complaints have come to us concerning this hotel, and our inspector was asked to make a report on existing conditions. We are confident that he endeavored to make a fair report, as he is that type of man. We further realize that you have a good man running the hotel, and that he is endeavoring to make the best out of the plant in which he is established.

As soon as you plan re-building or remodeling this building, or make such additional repairs as are necessary to render it habitable, and desire any assistance from us, we will be pleased to have our inspector make another visit there, and coöperate with you in any manner that will be of service in the establishing of this hotel on a proper sanitary basis.

We trust that some action will be taken very speedily to better materially the existing conditions in the hotel, and you may rest assured that we will be pleased to give you any assistance in our power."

On June 27th, we wrote these parties relative to this matter and asked for an immediate reply.

"We wish to call your attention to our letter of June 8th, 1914, to which you have not as yet replied.

Kindly give this matter your immediate attention."

On June 30th, the following reply was received:

"I am in receipt of your letter of June 27th, and beg to say in reply that we have tentative plans under way at the present time both for remodeling moderately the old hotel and also the building of a new one. You appreciate, of course, that a matter of this kind cannot be arrived at definitely in a short time. We are proceeding as fast as we are able, and hope that something definite is done in a reasonable time that will be satisfactory to you."

We anticipate that a new hotel or addition will be built at this location, which will be greatly appreciated by the traveling public, as the present structure has been a cause for complaint for many years.

We realize, of course, that many of the hotels and restaurants throughout the state are not up to the required standard. There is always a good reason for this. In some cases the proprietor does not comprehend fully just what is required. For quite a number of years he has probably conducted his place of business in a certain way, and he does not readily appreciate the necessity for the improvements recommended. However, a copy of the rules and regulations has been sent and the improvements suggested will doubtless be installed as soon as the proprietor

makes up his mind that this must be done, and how he is going to do them.

If he does not improve his place of business so that it meets the requirements, action will be taken at a later date by this office, upon the report of our inspectors that our orders have not been complied with.

We realize that it is easy to make recommendations and issue orders for changes (and we never make them unless they are advisable, all phases of the situation considered); and we know also that it is a difficult matter to put them into operation, especially when one become accustomed to other conditions.

At a subsequent inspection of these places we will see very plainly whether or not the proprietor desires to coöperate with us as fully and freely as he should, and we will be governed accordingly.

We will be glad to forward a copy of the rules and regulations governing hotels and restaurants to anyone upon request, and always appreciate the assistance which can be given us by the public in reporting to us such cases of gross negligence and insanitary conditions as come to their notice. It is only by these methods of coöperation that the greatest good can be accomplished.

Below is shown statistics of inspections, etc., to June 30, 1914.

Number of permits issued	4,304
Inspections made	877
Insanitary places on which written orders were issued	203
Favorable replies received from	88
In correspondence and in suspense owing to the time allowed not having expired	115
Complaints from the traveling public on specific hotels taken care of	37

The following is a statement of the expenditures for salaries, postage, and office supplies incurred by the Hotel & Restaurant Division to June 30, 1914:

W. G. Mase, salary and expenses	$1,084 54
E. U. F. Loether, salary and expenses	1,006 75
E. J. Brown, salary and expenses	347 38
Helen O'Connell, salary	121 12
Printing	384 07
Postage, supplies, etc.	514 78
	$3,458 64

REPORT OF THE PLUMBING DIVISION FROM OCTOBER 2, 1913, TO JUNE 30, 1914.

FRANK R. KING, State Plumbing Inspector.

When Chapter 731, Laws of 1913, known as the new Plumbing Law, became operative on October 2, 1913, the duties of the State Board of Health were enlarged to include the work of licensing plumbers, supervising and inspecting plumbing and adopting and enforcing a state plumbing code.

All plumbers actually engaged in work in Wisconsin at the time of the passage and publication of the law, were licensed without examination under the waiver provision. To January 1st, 1914, licenses had been issued under the waiver act to 550 master plumbers, 1020 journeymen; and to 362 plumbing contractors. Plumbing contractors may be licensed at any time without examination, provided the contractor also holds a license as master or employs at all times a licensed master plumber to superintend installations of plumbing.

In the early application of the license provision of the law, licenses were issued without examination, to practically all the master and journeyman plumbers who made satisfactory application for same. This was done in compliance with Section 959—55a 1 of the statutes, which provides that

"All persons at the time of the passage and publication of this act engaged in the plumbing business in this state * * * shall be respectively licensed as such by the State Board of Health without examination, upon the payment to the State Board of Health of the fee hereinafter provided."

In a letter from the Attorney-General, dated March 3, 1914, the Board was advised that, according to the construction placed

on the license sections of the law by the Attorney-General, the time had expired for granting licenses under the waiver provision above quoted; and thenceforth no licenses were issued to either master or journeymen plumbers without the applicant first passing a satisfactory examination.

The number of master's licenses issued under the waiver provision was 573; and the number of journeyman's licenses 1052.

From October 2, 1913 until June 30, 1914, licenses had been issued as follows: master plumbers—597; journeyman plumbers—1065; plumbing contractors—418.

From the time the law became effective to January 1, 1914, fees had been received and deposited with the State Treasurer amounting to $24,145.00, of which $22,020.00 was for *initial* license fees. Up to June 30, 1914, the total amount of remittances to the State Treasurer for initial and renewal fees was $33,-810.62. From the time of the enactment of the State Plumbing Law to June 30, 1914, the total expenditures for this work amounted to $7,204.01.

The first examination for the licensing of master and journeyman plumbers was held in Milwaukee, January 6, 1914, at the School of Trades, following which examination licenses were granted to three journeyman plumbers and five masters; one candidate for a master's license failed. The examination was conducted by the Committee of Plumbing Examiners, appointed early in the organization of the Plumbing Division, consisting of J. E. Robertson, Chairman, Milwaukee, Thomas M. Ferguson, Secretary, and W. G. Kirchoffer, Madison.

The second examination was held April 22, 1914 at Madison, as a result of which 19 master and 10 journeyman plumbers were granted licenses. At this examination one person who took the examination for journeyman's license failed to pass, and two persons who took the examination for master plumber's license did not show the required knowledge of the subject and therefore a license was refused.

Although the rules provide for at least two examinations yearly, one in January and one in July, it was found necessary to hold the special examination in April owing to the demand for licenses.

The State Board of Health is charged under the law with the duty of formulating a State Plumbing Code, which will prescribe rules and regulations governing plumbing installations

and establish a minimum standard of plumbing in Wisconsin. A tentative draft of the State Plumbing Code was prepared under the direction of the Board and distributed to the plumbers of the state and to manufacturers, architects and plumbing inspectors. This tentative Code was prepared by the following committee selected by the State Board of Health: Dr. C. A. Harper, State Health Officer, Madison; Frank R. King, State Plumbing Inspector, Madison; W. G. Kirchoffer, Sanitary Engineer for the State Board of Health, Madison; C. W. Price, Assistant to the State Industrial Commission, Madison; and George F. Reeke, a master plumber of Green Bay. In addition to the members of the committee, all of whom devoted some time to the work, valuable service was rendered and suggestions given by Robert E. Hasselkus, Milwaukee.

After the tentative Plumbing Code was prepared and printed copies were distributed as above stated, with requests for criticisms and suggestions for improvement. A large number of plumbers, architects, plumbing inspectors and other persons interested either wrote to the State Board of Health or communicated in person their suggestions for changes, which in their judgment would improve the Code and make it more valuable in safeguarding health and in insuring reasonable standards for plumbing materials and methods of installation.

The tentative Plumbing Code was revised and the criticisms and other suggestions for changes and additions were considered carefully by the following committee: F. R. King, State Plumbing Inspector; W. G. Kirchoffer, Sanitary Engineer for the State Board of Health; and L. W. Hutchcroft, Statistician for the State Board of Health.

The wisdom of issuing the Code first in tentative form was fully demonstrated by the large number of letters and personal interviews received, nearly all of which served to make the completed Code of more practical value. The official Code was adopted by the State Board of Health on April 6, 1914, and includes abstracts from the Plumbing Law, a synopsis of the opinions rendered by the Attorney-General on various problems raised in interpreting the law, explanation of plumbing terms, rules governing licensing and examination of plumbers and regulations of the State Board of Health governing plumbing, drainage and plumbing ventilation. The book also contains calculations, suggestions to plumbers, to the public and to local in-

spectors, and an appendix, giving the General Orders of the Industrial Commission on Sanitation. The volume is illustrated with various sketches showing methods of plumbing installations of all kinds, which "are an integral part of the Code".

Since the enactment of the State Plumbing Law 39 cities have been visited for the purpose of explaining the provisions of the law and the State Plumbing Code, also for making inspections of plumbing and drainage installations. Twenty-seven public meetings were held which were attended by city officials, plumbers and the general public, 182 new installations were inspected and 64 violations of the State Code found consisting of improper design, poor workmanship and material below the required standard. The following may be cited as the causes for these violations,—indifference, lack of knowledge, established custom, keen competition and lack of regulation and supervision.

There are in Wisconsin 18 cities which are required by law to appoint a local plumbing inspector and 35 cities in which plumbers are required to be licensed. 14 cities and 4 villages have provided for local inspection of plumbing and drainage installations, either in accordance with the state or with a local code. 26 cities were found to have local ordinances and 34 cities have requested assistance in amending their local ordinances or in formulating new suitable ordinances. The majority of cities have ordinances providing that cesspools shall not be placed in any public street, avenue, lane, alley, or sidewalk. These ordinances, however, do not take into consideration the location of cesspools relative to wells, cisterns, springs or other source of water supply. Ordinances were found in a number of cities providing that no privy vaults be installed within a given zone of either business or residence districts. A total of 94 public sewer systems were found in the cities and villages of the state, with a total of 131 municipal water systems and 27 private water systems.

SUMMARY.

Since its inauguration the Plumbing Division of the State Board of Health has completed the following work up to June 30, 1914:

It has issued licenses to 597 master plumbers; 1065 journeyman plumbers; and 418 plumbing contractors.

It has held two examinations, as a result of which 24 masters and 13 journeyman have been issued licenses.

It has formulated and issued the State Plumbing Code in book form.

It has compiled and issued a List of Licensed Plumbers of the state in book form.

It has made through the State Plumbing Inspector numerous trips of inspection throughout the state, and has given assistance in amending local plumbing and drain laying ordinances or in formulating new suitable ordinances.

The board feels assured from the investigations which have been made and from the results accomplished, that there is a demand for uniform state regulation of plumbing, drainage and plumbing installation. We feel confident that the enforcement of this law will aid materially in improving health conditions throughout the state and in insuring to the public more durable materials, better methods of installation and better protection against indifferent and unscrupulous plumbers.

FINANCIAL STATEMENT OF THE STATE LICENSING OF PLUMBERS AUGUST 28, 1913 TO JANUARY 1, 1914.

Balance cash on hand Jan. 1, 1914.....	$21,643 62	
Total amount of disbursements	2,501 68	
Total cash received in fees to Jan. 1, 1914.....		$24,145 30*

List of Disbursements.

Printing	$420 00
Office supplies	21 69
Postage	170 00
Misc.	8 04
Frank R. King, State Plumbing Inspector	421 58
T. M. Ferguson, Committee of Plumbing Examiners	390 00
J. E. Robertson, Committee of Plumbing Examiners	218 92
George F. Reeke, committee to formulate code	91 93
Robt. E. Hasselkus, Asst. to formulate code	65 78
F. H. Elwell, Asst. to formulate code.....	28 49
Esther Stromme, clerk and stenographer	412 50
Alice Alford, clerk and stenographer	114 00

*A part of this sum is for renewals; approximately $22,020 for initial fees.

Mary E. McNulty, clerk	71 25	
Mildred Pfister, clerk	36 25	
Charlotte McCarthy, clerk	31 25	
Total disbursements	$2,501 68	
Balance cash on hand	21,643 62	
		$24,145 30

Licenses have been granted as follows:

Plumbing Contractor ..... 362 (initial fee $40.00)
Master Plumber ..... 550 (initial fee $10.00)
Journeyman Plumber .....1020 (initial fee $2.00)

(Up to Jan. 1, 1914, $2,153.00 of the cash received in fees is for renewals for 1914; the balance is for initial fees.)

FINANCIAL STATEMENT OF THE STATE LICENSING OF PLUMBERS, JANUARY 1, TO JUNE 30, 1914.

Balance cash on hand	$21,643 62
Total cash received in fees	12,167 00*
Total cash	$33,810 62

List of Disbursements.

Robert E. Hasselkus, Asst. to formulate Code	$37 00
C. H. Stoddard, M. D., Asst. at Plumbers Examination, Milwaukee	27 53
Thos. M. Ferguson, committee plumbers examiners	291 78
George F. Reeke, committee to formulate code	44 84
W. G. Kirchoffer, committee plumbing examiners	717 14
G. W. Henika, expense to plumbers examination, Milwaukee	12 03
J. E. Robertson, committee plumbers examiners	141 84
Frank R. King, State plumbers inspector	900 00
Frank R. King, State plumbers inspector, traveling expenses	238 60
Alice Alford, clerk and stenographer	285 00
Charlotte McCarthy, clerk	194 00
Esther Stromme, clerk and stenographer	600 00
State Journal, pub. State Plumbing Code	225 60
Hoffman & Billings Mfg. Co., supplies for plumbing examiners	79 46
Sumner & Cramton, camera for verifying plumbing inspection	25 00
Ruth Bothum, stenographer	60 00
Total paid by voucher	$3,880 32

*A part of this sum is for renewals; approximately $2,800 is for initial fees.

Statements furnished for the following from Secretary of State:		
Printing and paper	$527 40	
Postage	215 20	
Stationery and office supplies	43 27	
Miscellaneous	36 12	
Total	$821 99	
Total disbursements		$4,702 31
Balance cash on hand		$29,108 31

Licenses have been granted as follows: Jan. 1, to July 1, 1914.

Plumbing Contractors	56	($40.00 initial fee)
Master Plumbers	47	(10.00 initial fee)
Journeyman Plumbers	45	(2.00 initial fee)

CONTAGIOUS DISEASES.

The following are the tables of contagious diseases for the calendar years of 1912 and 1913, compiled from the reports received by the State Board of Health from the local health officers in the various townships, incorporated cities and villages.

The statistical tables are made by calendar years instead of for the fiscal period, in order that the report may be comparable with similar statistics in the various states and cities, for practically all the states and larger cities have adopted this method of compiling statistics.

The statistical tables which follow this summary contain the report of all cases of diphtheria, typhoid fever, whooping cough, smallpox, scarlet fever, measles, tuberculosis, meningitis and acute anterior poliomyelitis or infantile paralysis, reported to the State Board of Health by the local health officers.

The investigation made by the state office shows that the local health officers report all cases of which they receive notice either from the attending physician or the responsible head of the family, if there is not a physician in attendance. The discrepancy, therefore, in the number of cases reported as compared with the number of deaths reported, is due to the failure on the part of the attending physician, responsible head of the family or other person having knowledge of the presence of this disease to report all facts in regard to the case to the local health officers.

It is interesting to note in the following outline the difference in the number of deaths from the various diseases reported by the local health officers and in the number of deaths taken from the actual mortality record:

Disease.	Health Officer Report 1912.	Mortality Record 1912.	Health Officer Report 1913.	Mortality Record 1913.
Diphtheria	211	279	239	293
Typhoid Fever	170	310	139	237
Whooping Cough	89	232	47	211
Smallpox	2	3	3	4
Scarlet Fever	171	283	124	197
Measles	47	127	77	210
Tuberculosis	663	2,362	877	2,328
Meningitis	79	280	78	290
Anterior Poliomyelitis	25	25	25	25
Total	1,457	3,901	1,609	3,795

After having carefully studied the above table we feel thoroughly justified in stating that the reports of contagious diseases from the various cities, incorporated villages and townships are not complete. The latest rules adopted by the State Board of Health specifically state,

"It shall be the duty of every physician called to attend a person sick, or supposed to be sick, with any of the diseases declared to be dangerous and contagious diseases by the State Board of Health, within 24 hours thereafter to report in writing the name and residence of such person to the board of health, or its proper officer, within whose jurisdiction such person is found; and when a person is taken sick with any of the aforesaid named diseases as are declared dangerous and contagious by the State Board of Health, and a physician is not called, it shall in like manner be the duty of the owner or agent of the building in which such person resides, lives or is staying, or of the head of the family in which such disease occurs to report in writing the name and residence of the patient to the local board of health or its proper officer."

We trust that through the work of our five deputy state health officers our reports of contagious diseases will be more complete. The deputies are in a position to thoroughly investigate and discover cases where physicians and health officers are not acting in compliance with the law and in such cases they are required to prosecute any person who violates the law.

TABLE NO. 1—SHOWING CASES OF CONTAGIOUS DISEASES REPORTED TO THE STATE BOARD OF HEALTH BY THE LOCAL HEALTH OFFICERS FROM JANUARY 1, 1912, TO DECEMBER 31, 1912. DEATHS ARE TAKEN FROM THE MORTALITY RECORD.

County.	Diphtheria.		Typhoid Fever.		Whooping Cough.		Smallpox.		Scarlet Fever.		Measles		Tuberculosis.		Meningitis.		Acute Anterior Poliomyelitis.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases	Deaths.
Adams	4						14		5	1				7				
Ashland	16	2	7	8	24	3			4		5		8	28		8		
Barron	14		11	4	2	2	2		83	2	2		1	29		6		
Bayfield	5		4	3		1			3		34	1	1	11		3		
Brown	75	9	10	8	52	5	79		83	5	1	2	42	54		10	1	
Buffalo	5	2			1		18	1	6		2	1	2	14	1	3	1	1
Burnett							1						5	15				
Calumet	6				37	3			4				3	18		3		
Chippewa	16	3	1	3		2	3		27	1		1	19	43	2	2		
Clark	32	6	3	1	7		43		10		2		4	20				
Columbia	13	1	1	2	25	1	3		20	1			2	33		8	3	1
Crawford	2		1		2	3	2		3				1	13	1	4		
Dane	32	2	25	4	18	4	27	1	97	3	5		6	65	1	11		
Dodge	8	3	8	2	12	3	2		116	15	36	4	5	36		3	3	2
Door	5	2	3	1		1			10	6	1		2	11				
Douglas	94	8	9	8	7	2	23		35	7	3	1		57		9	1	2
Dunn	3					3	18		10	4	2			25		2		
Eau Claire	3	1	2	2		1	27		4	3		1	1	36		7		
Florence														4				
Fond du Lac	67	5	11	3		3	8		30	1	3		10	59	2	5		
Forest	1						1				1			4		1		
Grant	7	2	3	3		3	1		53	8	1		4	20		5	1	
Green	3	2		1		2			64	1			3	12	1	3		1
Green Lake	1					1	12		1		4		2	16				
Iowa				1	1	1	6		10				1	14		1	2	
Iron	1		1		22	1			1		13	4		10		1		
Jackson	5					2	32			2	5			21	1	3		
Jefferson	12	2	1		3	3	16		90	11	1		7	32	1	3	2	
Juneau	25	5		1		3	2		23	1			2	16	2	3		
Kenosha	44	5	26	8	17	2			303	55	16	3	18	33	2	2		
Kewaunee	18	1	1	1					67	3				17				

La Crosse	68	7	9	4	.....	1	81	.....	46	.....	1	.....	21	59	3	5	.....	.....
Lafayette	13	3	2	3	4	.....	.....	.....	13	1	.....	.....	1	10	.....	.....	2	.....
Langlade	12	2	3	1	.....	2	.....	.....	11	1	1	1	.....	5	.....	3	.....	.....
Lincoln	16	2	10	3	17	2	.....	.....	10	.....	94	1	.....	12	.....	2	1	.....
Manitowoc	29	2	2	6	8	3	2	.....	11	2	1	1	.....	50	1	10	.....	.....
Marathon	51	10	35	5	1	10	45	1	148	8	167	8	5	50	1	6	7	1
Marinette	18	.....	41	6	1	5	1	.....	34	3	53	2	3	37	.....	2	.....	.....
Marquette	1	2	.....	1	.....	2	8	.....	.....	.....	.....	.....	1	8	.....	1	.....	.....
Milwaukee	815	123	617	128	729	97	62	.....	1,064	68	2,360	71	875	615	43	55	.....	4
Monroe	9	3	12	2	2	2	44	.....	23	1	1	.....	2	23	.....	.....	.....	.....
Oconto	22	.....	4	1	1	.....	2	.....	26	2	.....	.....	.....	18	.....	2	.....	.....
Oneida	3	1	4	1	12	.....	.....	.....	1	.....	16	4	1	14	.....	1	.....	.....
Outagamie	12	1	20	4	.....	2	4	.....	36	2	1	1	15	47	.....	4	.....	1
Ozaukee	3	.....	4	1	.....	3	.....	.....	3	2	3	5	1	7	.....	1	.....	.....
Pepin	.....	.....	3	1	.....	1	.....	.....	1	.....	1	.....	.....	4	.....	1	.....	1
Pierce	2	3	7	.....	12	1	3	.....	5	.....	1	1	2	14	.....	2	.....	.....
Polk	14	2	6	1	2	.....	7	.....	25	2	.....	.....	4	24	.....	1	.....	.....
Portage	2	2	11	3	.....	2	35	.....	31	2	2	.....	.....	25	2	7	.....	.....
Price	5	.....	2	3	.....	1	.....	.....	30	2	119	4	.....	9	.....	1	.....	.....
Racine	81	14	1	20	.....	10	.....	.....	73	3	.....	.....	1	78	.....	10	.....	.....
Richland	3	.....	1	1	8	1	13	.....	29	2	.....	.....	5	18	1	2	1	4
Rock	22	3	7	4	11	4	1	.....	36	2	2	.....	20	43	.....	6	9	1
Rusk	8	1	1	.....	.....	2	2	.....	34	2	3	.....	1	7	.....	1	.....	.....
St. Croix	2	1	2	2	.....	1	12	.....	5	.....	.....	.....	2	22	.....	1	.....	.....
Sauk	8	1	7	3	8	.....	11	.....	43	2	3	.....	3	18	.....	1	.....	.....
Sawyer	.....	.....	.....	.....	1	.....	.....	.....	12	.....	.....	.....	.....	13	.....	.....	.....	.....
Shawano	16	2	4	3	29	.....	3	.....	14	2	.....	.....	35	28	1	2	.....	.....
Sheboygan	35	4	17	6	8	.....	1	.....	36	4	84	3	23	46	2	9	.....	.....
Taylor	.....	1	.....	2	.....	5	.....	.....	20	.....	.....	1	.....	7	1	4	5	.....
Trempealeau	10	5	1	1	.....	1	30	.....	4	.....	.....	.....	3	32	.....	6	.....	.....
Vernon	12	4	2	1	10	3	8	.....	18	.....	52	.....	3	32	3	2	.....	.....
Vilas	1	1	.....	.....	.....	.....	.....	.....	30	3	2	.....	.....	5	.....	.....	.....	.....
Walworth	8	.....	.....	1	50	1	1	.....	25	1	42	3	3	27	.....	1	8	3
Washburn	.....	.....	9	2	24	.....	.....	.....	1	.....	.....	.....	2	5	.....	.....	.....	.....
Washington	17	1	9	4	.....	5	.....	.....	9	1	30	.....	6	15	4	3	2	1
Waukesha	5	1	4	1	3	2	7	.....	20	2	5	2	1	53	4	3	2	1
Waupaca	6	2	2	7	.....	.....	11	.....	19	8	47	1	3	13	2	6	.....	.....
Waushara	23	6	.....	1	2	4	20	.....	55	12	1	.....	3	8	.....	.....	.....	.....
Winnebago	31	7	12	8	6	3	9	.....	74	5	1	.....	7	56	2	9	3	1
Wood	13	1	8	5	1	1	47	.....	67	8	5	.....	5	32	.....	4	.....	.....
Total	1,913	279	1,007	310	1,180	232	811	3	3,304	283	3,235	127	1,206	2,362	82	280	54	25

TABLE NO. 2—SHOWING CASES OF CONTAGIOUS DISEASES REPORTED TO THE STATE BOARD OF HEALTH BY THE LOCAL HEALTH OFFICERS FROM JANUARY 1, 1913, TO DECEMBER 31, 1913. DEATHS ARE TAKEN FROM THE MORTALITY RECORD.

County.	Diphtheria.		Typhoid Fever.		Whooping Cough.		Smallpox.		Scarlet Fever.		Measles.		Tuberculosis.		Meningitis.		Acute Anterior Poliomyelitis.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Adams	9	1	.....	1	12	1	2	.....	3	.....	26	1	1	6	.....	2	.....	.....
Ashland	14	2	10	8	23	5	7	.....	6	.....	582	3	7	22	5	5	2	1
Barron	7	2	4	1	101	3	78	.....	39	2	237	7	5	20	.....	1	.....	1
Bayfield	8	.....	28	3	.....	1	.....	.....	1	.....	.....	2	2	7	.....	.....	.....	.....
Brown	43	3	5	5	40	14	270	1	44	9	12	.....	22	59	2	10	1	.....
Buffalo	11	.....	.....	.....	.....	.....	23	.....	.....	2	10	2	1	11	2	1	.....	.....
Burnett	2	.....	3	.....	.....	1	.....	.....	.....	1	11	1	.....	8	.....	1	.....	.....
Calumet	9	.....	12	2	36	1	.....	.....	5	.....	.....	1	13	14	2	1	4	.....
Chippewa	22	1	2	4	15	4	5	.....	21	5	89	3	23	38	1	3	.....	.....
Clark	5	1	.....	4	31	4	11	2	9	.....	34	1	2	14	.....	3	.....	1
Columbia	4	1	1	2	4	5	83	.....	25	2	13	.....	3	26	.....	8	1	1
Crawford	2	1	1	.....	.....	.....	10	.....	4	.....	18	1	1	16	.....	1	.....	.....
Dunn	54	6	20	7	65	6	145	.....	168	4	289	4	41	89	1	8	1	.....
Dodge	29	3	5	2	26	3	39	.....	70	2	124	3	9	37	.....	5	.....	.....
Door	2	.....	2	1	217	5	.....	.....	2	.....	29	2	5	9	.....	1	1	.....
Douglas	18	.....	27	7	.....	7	37	.....	79	2	69	16	49	62	2	7	.....	1
Dunn	2	.....	8	2	22	4	12	.....	6	1	27	3	11	24	.....	1	.....	.....
Eau Claire	7	.....	2	6	.....	3	3	.....	5	2	25	8	.....	28	.....	6	.....	.....
Florence	.....	.....	.....	2	.....	1	.....	.....	5	.....	14	.....	3	5	.....	1	.....	.....
Fond du Lac	38	5	38	9	2	6	2	.....	28	1	140	1	22	50	.....	1	4	.....
Forest	12	2	4	.....	8	.....	18	.....	2	.....	1	.....	2	7	1	1	.....	.....
Grant	13	1	7	4	.....	1	2	.....	9	.....	14	.....	10	24	2	5	32	1
Green	.....	.....	1	.....	.....	.....	.....	.....	3	2	26	.....	4	16	.....	2	.....	2
Green Lake	10	3	12	1	16	1	.....	.....	4	.....	103	4	4	12	.....	.....	.....	1
Iowa	5	3	.....	.....	.....	.....	3	.....	4	.....	60	1	8	13	.....	1	.....	.....
Iron	.....	.....	.....	.....	1	1	1	.....	15	.....	30	4	1	8	1	2	.....	.....
Jackson	8	1	1	1	15	.....	11	.....	8	.....	2	.....	2	10	.....	3	1	1
Jefferson	9	2	1	1	5	3	52	.....	81	7	136	1	11	38	.....	2	4	1
Juneau	15	4	4	1	.....	2	3	.....	29	1	35	1	1	25	.....	1	.....	.....
Kenosha	19	6	48	11	8	2	28	.....	71	6	316	12	38	30	.....	4	1	1
Kewaunee	21	5	1	.....	.....	2	76	.....	45	2	4	1	5	20	.....	1	1	.....

La Crosse	89	4	12	4	2	2	58	1	22	1	41	2	23	46	2	7	6	1
Lafayette	5	1	1	.....	.....	2	1	.....	4	.....	15	2	3	8	.....	2	.....	.....
Langlade	21	3	4	2	.....	1	.....	.....	6	.....	.....	.....	5	10	.....	2	1	.....
Lincoln	6	1	8	1	.....	1	4	.....	1	.....	98	.....	5	11	.....	4	.....	.....
Manitowoc	29	3	17	6	16	.....	7	.....	17	7	18	1	10	41	1	2	1	1
Marathon	32	4	20	7	6	17	58	.....	46	6	9	.....	14	44	.....	5	3	1
Marinette	9	1	18	3	5	2	79	.....	26	1	4	1	4	27	3	4	.....	.....
Marquette	10	2	.....	1	3	2	1	.....	7	.....	.....	3	1	12	.....	.....	.....	1
Milwaukee	1,195	159	177	57	188	17	524	.....	849	81	1,408	33	1,012	676	37	70	.....	2
Monroe	5	1	1	1	.....	.....	25	.....	14	1	70	3	3	17	.....	4	2	1
Oconto	4	2	3	1	12	.....	18	.....	22	1	34	.....	8	23	.....	1	.....	.....
Oneida	5	.....	1	1	.....	.....	34	.....	36	.....	.....	.....	2	5	.....	.....	.....	.....
Outagamie	25	2	11	4	2	5	2	.....	28	7	115	3	6	44	.....	10	1	.....
Ozaukee	4	.....	.....	.....	1	1	12	.....	15	2	21	5	3	15	.....	1	.....	.....
Pepin	5	2	5	3	14	.....	3	.....	.....	.....	27	3	.....	6	1	2	.....	.....
Pierce	4	.....	1	.....	2	.....	1	.....	1	.....	209	1	3	20	.....	3	1	1
Polk	13	1	3	1	2	.....	32	.....	9	3	79	5	7	22	.....	1	.....	.....
Portage	11	6	3	3	.....	1	.....	.....	3	.....	24	3	3	22	1	6	.....	.....
Price	4	.....	3	1	.....	1	1	.....	20	1	5	1	6	8	.....	.....	.....	.....
Racine	131	14	3	9	30	4	13	.....	112	2	262	7	6	66	.....	4	.....	.....
Richland	3	.....	6	1	16	2	21	.....	22	2	7	.....	6	11	1	2	1	.....
Rock	11	2	12	4	4	3	6	.....	44	2	85	3	27	43	.....	12	2	2
Rusk	11	4	4	1	10	4	6	.....	14	4	4	2	6	7	5	2	.....	.....
St. Croix	9	.....	4	2	.....	.....	32	.....	2	.....	89	9	8	18	.....	2	.....	.....
Sauk	14	.....	.....	.....	.....	.....	1	.....	1	.....	30	.....	55	18	.....	.....	.....	.....
Sawyer	1	.....	.....	.....	.....	.....	1	.....	2	.....	10	.....	.....	12	.....	.....	.....	.....
Shawano	6	.....	.....	.....	11	4	13	.....	8	1	68	1	12	30	1	7	2	.....
Sheboygan	65	11	27	7	75	16	17	.....	84	7	310	9	58	48	5	5	1	.....
Taylor	11	2	4	2	.....	3	16	.....	87	.....	14	3	2	2	1	.....	.....	.....
Trempealeau	6	1	2	.....	.....	.....	2	.....	6	.....	119	1	8	11	21	12	1	.....
Vernon	3	.....	5	1	2	1	.....	.....	20	1	11	1	3	19	1	2	1	.....
Vilas	.....	1	.....	.....	.....	1	.....	.....	.....	.....	3	.....	1	1	.....	.....	.....	.....
Walworth	9	2	10	2	15	6	5	.....	20	.....	31	1	7	24	.....	2	.....	1
Washburn	9	2	.....	3	8	4	.....	.....	.....	.....	15	3	1	2	.....	.....	.....	.....
Washington	15	.....	10	3	29	3	6	.....	23	1	55	3	9	25	2	3	.....	.....
Waukesha	13	1	2	.....	.....	2	20	.....	26	3	63	6	4	68	2	7	.....	.....
Waupaca	6	1	4	.....	.....	1	2	.....	2	1	4	.....	4	22	.....	7	2	2
Waushara	7	2	2	2	3	1	.....	.....	108	8	113	7	7	9	.....	1	.....	.....
Winnebago	59	4	22	9	25	16	21	.....	98	.....	32	3	18	67	4	6	1	.....
Wood	20	1	18	10	18	2	71	.....	11	3	68	2	11	20	.....	4	.....	.....
Total	2,283	293	670	237	1.146	211	2,034	4	2,806	197	6,046	210	1,677	2,328	108	290	79	25

DIPHTHERIA.

During the calendar year of 1912, 1913 cases of diphtheria and 279 deaths were reported to the State Board of Health. This shows a mortality rate of 14.5. During the calendar year of 1913, 2283 cases and 293 deaths were reported, which shows a decline in the mortality rate to 12.8. In 1908 the mortality rate was 22.2, in 1909 a rate of 20.7, in 1910 a rate of 17.4, in 1911 a rate of 14.5, in 1912, 14.5 and in 1913 a rate of 12.8. There has been a steady decline in the mortality rate since 1908, which is undoubtedly due to a more widespread use of antitoxin and to an increased accuracy in the reporting of cases.

Diphtheria is a most highly contagious disease, rapidly communicated from person to person or from infected articles, and unfortunately does not render one immune from a second attack. Since the cause of diphtheria is known there seems little or no excuse for its general widespread. Filth plays an important part in the spread, for insanitary conditions tend to lower vitality and to increase the susceptibility to the disease. Diphtheria is, however, a preventable disease in every sense of the word and its prevention lies in our ability to combat the germ that causes it.

TABLE NO. 3.—SHOWING THE TOTAL CASES OF DIPHTHERIA REPORTED TO THE STATE BOARD OF HEALTH BY LOCAL HEALTH OFFICERS SINCE 1902.

MONTH.	YEAR											
	1902	1903	1904	1905	1906	1907	1908	1909	Quarterly 1910	Quarterly 1911	Quarterly 1912	Quarterly 1913
January	.....	141	131	105	100	182	.....	.....	.....	.....	.....	.....
February	.....	94	100	55	84	180	.....	.....	.....	.....	.....	.....
March	.....	80	71	74	84	110	461	647	564	626	525	564
April	.....	58	63	41	48	117	.....	.....	.....	.....	.....	.....
May	.....	70	54	45	70	117	.....	.....	.....	.....	.....	.....
June	.....	91	40	30	63	121	315	286	493	442	376	478
July	.....	74	89	87	47	84	.....	.....	.....	.....	.....	.....
August	.....	78	77	59	60	103	.....	.....	.....	.....	.....	.....
September	.....	78	92	133	78	81	248	382	614	395	353	412
October	140	108	204	138	272	.....	.....	.....	.....	.....	.....	.....
November	231	74	98	187	255	698	.....	.....	.....	.....	.....	.....
December	163	104	118	163	252	.....	680	660	786	324	659	829
Total....	534	1,050	1,137	1,117	1,413	1,793	1,704	1,984	2,457	2,287	1,913	2,283

TABLE NO. 4.—SHOWING MORTALITY FROM DIPHTHERIA BY YEARS SINCE 1895.

For year ending	Number of places reporting	Cases	Deaths	Mortality rate
September 30, 1895	107	1,368	235	17
" 1896	130	2,097	410	19
" 1897	172	2,015	461	22
" 1898	169	1,775	271	15
" 1899	189	2,003	263	13
" 1900	185	2,056	282	13
" 1901	245	2,135	294	13.7
" 1902	221	1,898	272	14.3
" 1903	155	1,298	207	15
" 1904	334	1,003	113	11
" 1905	288	1,049	126	11.4
" 1906	302	1,131	127	11
October to December, 1906	130	776	69	8.8
Calendar year of 1907	386	1,793	186	10.3
" 1908	441	1,692	376	22.2
" 1909	228	1,984	411	20.7
" 1910	251	2,457	429	17.4
" 1911	377	2,287	332	14.5
" 1912	202	1,913	279	14.5
" 1913	267	2,283	293	12.8

TYPHOID FEVER.

Table No. 6 shows that for the calendar year of 1912, 1,007 cases of typhoid fever and 310 deaths were reported to the State Board of Health. This shows a mortality rate of 30.7. In 1913 there were only 670 cases of typhoid and 237 deaths. This shows a mortality rate of 35.3 or about one-third of the total number of cases reported resulted in death. The number of cases has decreased from 2,446 in 1910 to 670 cases in 1913, but the mortality rate has increased from 22.8 in 1910 to 35.3 in 1913. The above is conclusive evidence that the reports of the cases of typhoid fever are incomplete for it is reasonable to assume that the methods used for treating this disease in 1913 are equally as good as the methods used in 1910 and presumably better. Therefore, we feel justified in saying that there has been no appreciable increase in the mortality rate since 1910, despite the fact that the actual figures are larger.

It is evident that the preventing of this disease is one of the most important problems in sanitation that confront us today. The rate of prevalence of this disease is a fair measure of the sanitary intelligence exercised by any community; while other communities have become so accustomed to having typhoid fever in their midst that nothing is done to prevent it. Typhoid fever could be practically eradicated if we took proper precau-

tions concerning our water supply, sewerage disposal, and proper care of the excreta from persons sick with the disease.

TABLE NO. 5.—SHOWING THE TOTAL NUMBER OF CASES OF TYPHOID FEVER REPORTED TO THE STATE BOARD OF HEALTH BY LOCAL HEALTH OFFICERS SINCE 1902.

MONTH.	YEAR											
									Quarterly			
	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913
January	.....	54	26	15	60	92	.....	.....	.....	.....	.....	.....
February	.....	20	33	6	93	88	.....	.....	.....	.....	.....	.....
March	.....	21	21	43	48	30	142	234	644	211	445	115
April	.....	27	17	3	63	26	.....	.....	.....	.....	.....	.....
May	.....	22	32	112	75	33	.....	.....	.....	.....	.....	.....
June	.....	24	17	21	33	31	187	156	692	212	183	174
July	.....	8	19	42	51	39	.....	.....	.....	.....	.....	.....
August	.....	24	24	55	64	32	.....	.....	.....	.....	.....	.....
September	.....	20	102	97	75	58	197	225	677	242	180	133
October	60	125	242	80	159	.....	.....	.....	.....	.....	.....	.....
November	70	35	62	59	119	295	.....	.....	.....	.....	.....	.....
December	24	42	54	81	69	.....	319	319	433	374	199	248
Total.....	154	422	649	614	909	724	845	934	2,446	1,039	1,007	670

TABLE NO. 6.—SHOWING MORTALITY FROM TYPHOID FEVER BY YEARS SINCE 1895.

For year ending	Number of places reporting	Cases	Deaths	Mortality rate
September 30, 1895	59	993	144	14.5
" 1896	66	1,234	171	13.8
" 1897	146	658	126	19.9
" 1898	165	1,085	109	10
" 1899	224	1,312	120	9
" 1900	233	1,465	178	12
" 1901	291	1,804	236	13
" 1902	208	1,007	153	15
" 1903	62	374	80	21
" 1904	126	393	20	5
" 1905	111	752	34	4.5
" 1906	132	782	112	14
October to December, 1906	58	348	23	6.6
Calendar year of 1907	153	724	97	13.3
" 1908	183	845	319	37.5
" 1907	110	934	352	37.6
" 1910	154	2,446	558	22.8
" 1911	199	1,039	319	30.7
" 1912	125	1,007	310	30.7
" 1913	137	670	237	35.3

WHOOPING COUGH.

Table No. 7 shows the total cases of whooping cough reported to the State Board of Health since 1902. In 1910 there were more cases of this disease reported than in any year previous since the statistics have been reliable. The number of cases reported has increased from 211 in 1902 to 1,156 in 1911. In 1912 the number decreased to 612 cases but in 1913 it jumped again above the thousand mark.

Whooping cough is more prevalent among children than adults and oftentimes proves fatal. Every precaution should be taken to prevent children from contracting the disease and much can be done toward preventing its spread if we can impress upon every mother the absolute falsity of the old saying, "My child must have whooping cough and the sooner the better."

In 1912 there were 232 deaths from whooping cough which gives a mortality rate of 19.6. In 1913 there were 211 deaths which gives a mortality rate of 18.2.

TABLE NO. 7.—SHOWING TOTAL CASES OF WHOOPING COUGH REPORTED TO THE STATE BOARD OF HEALTH BY LOCAL HEALTH OFFICERS SINCE 1902.

MONTH	YEAR											
	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913
January	.....	19	.....	1	17	71	.....	.....	.....	.....	.....	.....
February	.....	37	.....	1	21	24	.....	.....	.....	.....	.....	.....
March	.....	21	3	.....	77	40	130	106	265	199	341	379
April	.....	5	1	.....	35	66	.....	.....	.....	.....	.....	.....
May	.....	5	1	50	24	61	.....	.....	.....	.....	.....	.....
June	.....	5	.....	4	79	28	159	64	406	172	472	196
July	.....	2	.....	56	37	33	.....	.....	.....	.....	.....	.....
August	.....	3	.....	12	27	16	.....	.....	.....	.....	.....	.....
September	.....	20	.....	31	37	22	218	241	278	103	223	207
October	42	50	12	4	129	.....	.....	.....	.....	.....	.....	.....
November	130	23	9	12	82	92	.....	.....	.....	.....	.....	.....
December	38	.....	.....	23	58	.....	65	271	207	138	144	364
Total	211	190	26	194	623	453	572	682	1,156	612	1,180	1,146

SMALLPOX.

Smallpox, one of the most dangerous of existing diseases, has been aptly termed "The worst of human maladies." Over a century ago before vaccination was known, smallpox caused one-tenth of all the deaths of the human race and one-third of all the deaths under 10 years of age. The sole protection and absolute preventive against this disease is *vaccination.* General cleanliness will undoubtedly help modify the character of the disease but has practically no effect in preventing its contraction.

In the year 1910 smallpox decreased in Wisconsin to 488 cases but has rapidly increased and in 1912 there were 811 cases reported and in 1913 the high water mark was reached with a total of 2,034 cases reported. The mortality rate is exceedingly low, there being only 3 deaths in 1912 and 4 deaths in 1913. Although the mortality rate is low there seems no excuse for the serious epidemics that exist. It is an easy matter to control the spread of smallpox in any locality where people will submit to general vaccination.

TABLE NO. 8.—SHOWING THE TOTAL CASES OF SMALLPOX REPORTED TO THE STATE BOARD OF HEALTH BY LOCAL HEALTH OFFICERS SINCE 1904.

MONTH	YEAR									
	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913
January	.....	256	143	144	.....	.....	.....	.....	.....	.....
February	.....	108	101	109	.....	.....	.....	.....	.....	.....
March	.....	161	128	122	566	719	197	134	236	556
April	.....	59	50	151	.....	.....	.....	.....	.....	.....
May	.....	91	116	138	.....	.....	.....	.....	.....	.....
June	.....	77	41	137	594	273	128	129	183	541
July	.....	54	77	53	.....	.....	.....	.....	.....	.....
August	.....	11	57	40	.....	.....	.....	.....	.....	.....
September	.....	9	8	26	173	160	54	42	108	173
October	44	8	19	.....	.....	.....	.....	.....	.....	.....
November	37	151	135	490	.....	.....	.....	.....	.....	.....
December	227	130	195	.....	589	103	109	222	284	764
Total	308	1,115	1,070	1,410	1,922	1,255	488	527	811	2,034

SCARLET FEVER.

Scarlet fever is essentially a disease of childhood although adults may and do very frequently have it. The specific cause of this disease is not known but the same precautions should be exercised in preventing its spread as are exercised in preventing the spread of any contagious disease, for we are lead to believe by analogy that scarlet fever is a germ disease, though the germ has not been isolated.

During the calendar year of 1910 there was an astonishing amount of scarlet fever in Wisconsin—5,045 cases were reported to the State Board of Health. In 1911 there were 4,148 cases reported; in 1912, 3,309 cases reported and in 1913 the number had dropped to 2,806 cases, a little more than one-half the number of cases reported in 1910.

The decrease has undoubtedly been due in part to the amendment of the rules adopted by the Board of Health, which requires the quarantining of scarlet fever for at least twenty-one (21) days from the beginning of the disease and as much longer as the severity of the case may demand, that is, until complete desquamation or scaling of the skin of the patient and disinfecting of the patient and premises.

Children convalescing from scarlet fever must not attend for at least six weeks from the beginning of the disease. Children who have been associated with the patient suffering from scarlet fever shall not attend school for ten (10) days after disinfection of premises and removal of quarantine in quarantined home.

TABLE NO. 9.—SHOWING THE TOTAL CASES OF SCARLET FEVER REPORTED TO THE STATE BOARD OF HEALTH BY LOCAL HEALTH OFFICERS SINCE 1902.

MONTH	YEAR											
	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913
January	.....	434	233	144	84	109	.....	.....	.....	.....	.....	.....
February	.....	206	176	153	93	84	.....	.....	.....	.....	.....	.....
March	.....	168	194	163	54	59	365	831	1,856	1,581	1,465	1,137
April	.....	100	101	99	37	60	.....	.....	.....	.....	.....	.....
May	.....	161	88	127	138	108	.....	.....	.....	.....	.....	.....
June	.....	102	109	36	53	53	295	802	1,371	993	876	821
July	.....	72	50	33	25	34	.....	.....	.....	.....	.....	.....
August	.....	49	76	36	27	33	.....	.....	.....	.....	.....	.....
September	.....	45	59	51	26	27	163	722	782	460	333	218
October	124	117	134	50	60	.....	.....	.....	.....	.....	.....	.....
November	215	124	155	140	97	208	.....	.....	.....	.....	.....	.....
December	215	133	144	84	84	.....	622	1,184	1,036	1,114	630	630
Total.....	554	1,711	1,519	1,116	778	775	1,445	3,539	5,045	4,148	3,304	2,806

TABLE NO. 10.—SHOWING MORTALITY FROM SCARLET FEVER FROM REPORTS MADE BY LOCAL HEALTH OFFICERS.

For year ending	Number of places reporting	Cases	Deaths	Mortality rate
September 30, 1895	427	1,514	59	3.8
" 1896	72	983	25	2.5
" 1897	118	717	32	4.4
" 1898	118	603	17	2.8
" 1899	141	1,288	39	3
" 1900	236	4,497	170	3.7
" 1901	294	3,594	98	2.7
" 1902	383	3,516	142	4
" 1903	170	1,888	86	4.5
" 1904	372	1,460	41	2.8
" 1905	257	1,275	41	2.4
" 1906	229	811	30	3.7
October to December, 1906	55	242	7	2.9
Calendar year of 1907	222	775	46	5.9
" 1908	330	1,445	127	8.7
" 1909	220	3,539	352	9.9
" 1910	323	5,045	304	6
" 1911	392	4,148	225	5.4
" 1912	310	3,304	283	8.5
" 1913	296	2,806	197	7

MEASLES.

Measles and smallpox in the unvaccinated, tie for first place in the list of infectious diseases as to which one is the more contagious. Those who contend that "every person must some time have measles and that it is best to have it in childhood" are certainly mistaken. Measles is too frequently followed by the most serious complications and very often leaves children injured for life.

Abscesses in the ear, resulting in partial or total deafness, sore eyes which very often make the eyes permanently weak, cataarh not only of the head but also in the intestines are common complications arising from this disease. One of the most dreaded complications that follow measles is the inflammation of the fine air tubes causing broncho-pneumonia and often resulting in tuberculosis. It is evident from the above then that measles is to be feared and not trifled with and everything should be done to prevent it.

Table No 11 shows that in 1912, 3,235 cases of measles were reported to the State Board of Health and in 1913 this number was almost doubled, there being a total of 6,046 cases reported. It does not seem plausible to state that such an increase is due

entirely to more complete reports but partially to carelessness of certain communities in preventing the spread of this disease.

In 1912 there were 127 deaths which gives a mortality rate of 39.2 and in 1913 there were 210 deaths which gives a mortality rate of 34.7.

TABLE NO. 11.—SHOWING THE TOTAL CASES OF MEASLES REPORTED TO THE STATE BOARD OF HEALTH BY LOCAL HEALTH OFFICERS SINCE 1902.

MONTH.	YEAR								Quarterly			
	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913
January	.....	87	154	.....	259	89	.....	.....	.....	.....	.....	.....
February	.....	75	59	2	519	105	.....	.....	.....	.....	.....	.....
March	.....	29	57	35	433	165	557	1,353	944	1,871	870	1,572
April	.....	30	43	2	340	138	.....	.....	.....	.....	.....	.....
May	.....	97	94	31	285	317	.....	.....	.....	.....	.....	.....
June	.....	17	50	41	165	340	570	1,334	2,483	1,810	1,856	3,227
July	.....	27	28	17	55	23	.....	.....	.....	.....	.....	.....
August	.....	5	11	29	31	16	.....	.....	.....	.....	.....	.....
September	.....	1	5	9	2	.....	192	302	728	141	241	398
October	4	2	14	10	3	28	.....	.....	.....	.....	.....	.....
November	15	15	36	63	14	369	.....	.....	.....	.....	.....	.....
December	64	55	31	187	48	.....	431	94	576	856	268	849
Total	83	440	582	426	2,154	1,590	1,750	3,083	4,731	4,678	3,235	6,046

MENINGITIS.

Table No. 1 shows the report of cases and deaths from meningitis reported to the State Board of Health during the year 1912. There were 82 cases and 280 deaths reported during 1912.

Table No. 2 shows the report of cases and deaths from meningitis reported during 1913. There were 108 cases and 290 deaths reported during this time. It is evident from the above that the number of cases reported to the State Board of Health for meningitis are most incomplete. During both 1912 and 1913 there was more than twice as many deaths as cases reported. The deaths include both epidemic cerebrospinal meningitis and simple meningitis.

TABLE NO. 13.—SHOWING TOTAL CASES OF MENINGITIS REPORTED TO THE STATE BOARD OF HEALTH BY LOCAL HEALTH OFFICERS SINCE 1908.

MONTH	YEAR					
	1908	1909	1910	1911	1912	1913
January						
February						
March	15	9	14	11	19	33
April						
May						
June	20	10	8	18	25	31
July						
August						
September	93	5	9	10	23	17
October						
November						
December	10	18	5	9	15	27
Total	138	42	36	48	82	108

TUBERCULOSIS.

An excellent statement of the prevalence of tuberculosis has been given in the weekly bulletin of the health department of the city of Chicago, and is well worth quoting:

"Consumption is the most pauperizing of all diseases. Consumption kills more people than diphtheria, scarlet fever, smallpox, typhoid fever, cancer, appendicitis, meningitis and influenza combined."

There is no disease which has so profound a sociological import as tuberculosis. It breaks up homes, destroys family life and children are forced to seek aid from charity organizations. It kills off the bread winner and takes children out of school, thus lowering the mental efficiency of our present civilization and preventing progress. Even among the better fed and better clothed people, tuberculosis is all too common.

There is no disease which adds more to the profits of quack doctors and patent medicine men than tuberculosis. They fairly thrive on the poor ignorant people who have it.

It is estimated that one-ninth of the human race die of tuberculosis. Wisconsin adds its share to this list. Of all the diseases reported to the State Board of Health tuberculosis is more neglected than any other and should be the one to which the most attention is given.

In checking over our weekly reports we find more cases of tuberculosis not reported than any other disease, and the deaths often double and sometimes treble the number of cases reported.

In 1912 there were 1,206 cases of tuberculosis reported to the State Board of Health and 2,362 deaths. In 1913, 1,677 cases and 2,328 deaths.

Every physician in the state of Wisconsin is required to report every case of tuberculosis that he attends. A failure to do so is punishable by a prosecution. Practically every case of tuberculosis is attended by a physician at some time during its progress and if every physician considered it his duty to report every case of tuberculosis that he attends, where a positive diagnosis is made, the records in Wisconsin would be practically complete.

It is impossible to wage a successful educational campaign against tuberculosis unless we know where the cases are located.

TABLE NO. 12.—SHOWING TOTAL CASES OF TUBERCULOSIS REPORTED TO THE STATE BOARD OF HEALTH BY LOCAL HEALTH OFFICERS SINCE 1902.

MONTH	YEAR											
	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913
January	.....	5	.....	.....	47	75	.....	.....	.....	.....	.....	.....
February	.....	8	11	3	93	60	.....	.....	.....	.....	.....	.....
March	.....	10	3	2	57	78	217	226	358	154	326	345
April	.....	11	48	3	66	59	.....	.....	.....	.....	.....	.....
May	.....	10	10	53	125	68	.....	.....	.....	.....	.....	.....
June	.....	2	5	3	71	79	280	251	307	307	308	487
July	.....	2	14	2	54	63	.....	.....	.....	.....	.....	.....
August	.....	2	12	70	77	56	.....	.....	.....	.....	.....	.....
September	.....	.....	12	87	60	45	238	337	380	231	304	333
October	12	2	45	44	79	.....	.....	.....	.....	.....	.....	.....
November	7	4	15	49	62	206	.....	.....	.....	.....	.....	.....
December	4	3	18	59	50	.....	238	229	227	236	268	512
Total....	23	59	193	375	841	789	973	1,043	1,272	928	1,206	1,677

SPECIAL REPORT ON TUBERCULOSIS.

The State Board of Health has realized for a number of years that the reports of cases of tuberculosis occurring in the state are very incomplete and wholly inadequate to meet the requirements in any successful campaign against this dread disease. The laymen, and particularly those laymen engaged in any tuberculosis work, are prone to criticize the physician very severely for failure to report cases of tuberculosis to the local health officer as the law requires. Much of this criticism is warranted. The physicians of the state however, are not the only factors to be considered in getting a complete census of the tubercular cases. The law states very clearly that:

"It shall be the duty of every physician, or person, or owner, agent, manager, principal or superintendent of each and every public or private institution, or dispensary, hotel, boarding or lodging house in any township, incorporated village or city to report to the local department of health, in writing, or to cause such report to be made by some proper and competent person, the name, age, sex, occupation and latest address of every person afflicted with tuberculosis who is in their care or who has come under their observation within one week of such time."

The responsibility, therefore, for reporting cases of tuberculosis rests not only on the physicians of the state, but also on every person regardless of his occuption who has knowledge of cases of tuberculosis in the locality.

When any physician, after making such an examination as he considers necessary to properly diagnose the ailment, finds the case to be tuberculosis, it is his solemn duty to notify the local health officer and the patient, or his relatives, and to give to the patient such instructions as are essential to assist in preventing any further spread of the disease. Any physician who questions the right of the public by legislative enactments to require that this be done should have his license revoked.

The Legislature, in its sincere endeavor to adequately safeguard the health and lives of our citizens, a number of years ago, passed laws which prohibit anyone from practicing medicine in Wisconsin without a physician's license. As a result of this legislation this comparatively large and remunerative field has been set aside for the exclusive use of the licensed physicians of the state. For this reason, if for no other, the state has the right

to demand something in return for the privileges granted. Any physician who so far forgets the duty he owes to the public in stating that the question of tuberculosis is of concern only to himself and his patient is not worthy of the noble profession to which he belongs. The physician, however, in his relation to the reporting of tuberculosis merely presents one phase of this question.

The interested tuberculosis worker and others who have knowledge of the presence of a case of tuberculosis in a family are required, under the Wisconsin law, to report that case to the local health officer of the district in which the person resides in the same manner and under the same penalty for violation as the attending physician if one is employed.

Many physicians, who tell their patients plainly that they have tuberculosis, when the fact is clearly established, report that they rarely, if ever, see that case of tuberculosis again. This is for the reason that the tubercular patient is reluctant to accept a positive diagnosis and usually will travel from physician to physician until some one can be found who will state that the ailment is not tuberculosis. As soon as the patient is given this assurance he readily accepts the prescribed treatment and in most cases in about a year the patient is dead.

It must, therefore, be evident to any fair-minded person from this brief statement of the situation that the question of getting accurate and complete reports of cases of tuberculosis is one deserving of very thoughtful consideration. It would appear that a practical method of getting reports of these cases has not yet been found and until human nature is changed so that the problem will be faced squarely in every case our efforts will be more or less futile. The physicians must be encouraged to make a positive diagnosis in the early stages of the disease. Therefore, we fear that prosecutions will not serve the purpose of having cases of tuberculosis reported for the reason that it will discourage the making of a positive diagnosis in many cases. Any physician or other person who neglects or refuses to report cases of tuberculosis for the reason that he does not desire the condition of his patient to become public is only making excuses. Chapter 69, Laws of 1911, provides that,

"The report of all cases of tuberculosis shall be treated as confidential to the extent that the name or address of the patient shall not

be published by any newspaper, magazine or other paper or publication of general or special circulation."

During 1913 the State Board of Health made an earnest attempt to obtain direct from the attending physicians of the state a complete survey of all known cases of tuberculosis at that time. To this end the board distributed to all physicians of the state a blank asking for the name, residence, color, age, sex, occupation and duration of the disease for all cases of tuberculosis of which the physician has any knowledge. Each blank provided sufficient space for reporting fifty-one cases. The blanks were sent to more than 2,600 physicians together with a circular letter urging the physicians of the state to coöperate with us in obtaining a complete survey of all cases of tuberculosis in Wisconsin at that time. This method of collecting cases of tuberculosis was tried partly as an experiment and partly for the purpose of learning direct from the physicians, if possible, why the cases are not reported to the local health officer.

Out of a total of 2,600 physicians supplied with these blanks only 716 made any report whatever, and of this number 304 reported that they had no cases under their care at that time and that they knew of no positive cases of tuberculosis in the community. The 412 physicians who stated that they had knowledge of cases reported a total of 2,255 cases of tuberculosis, either under their treatment at the time the report was made or cases which they knew positively were tuberculosis. This gives an average of five cases for each physician, and if the same ratio of cases holds good for all the physicians of the state, if each physician had reported his cases promptly as requested with comparatively little effort we would have practically a complete survey of all cases in the state based upon the estimated number from the mortality reports.

From Table No. 16, showing cases of tuberculosis by counties according to color, age groups, sex, occupation, duration of disease, number in family and number of those in the family who have tuberculosis some interesting comparisons can be made.

The tabulation by color shows 2,161 white cases and 94 tubercular persons of other color mostly Negroes and Indians.

The tabulation by age groups is as follows:

Under 9 years of age	80
From 10–19 years of age	328
From 20–29 years of age	596
From 30–39 years of age	489
From 40–49 years of age	268
From 50–60 years of age	121
60 years of age and over	66
Age not stated	307

Arranging the cases by sex it is shown from Table No. 16 that 1,150 were males, 1,069 were females and in 36 cases the sex was not stated.

The tabulation by occupations is as follows: Bookkeeper 13; bartender 17; carpenter 18; clerk 49; domestic 52; dressmaker 17; engineer 10; farmer 212; housework 484; laborer 147; machinist 13; nurse 10; painter 15; salesman 14; school 158; teacher 26; no occupation 215; miscellaneous 223 and occupation not stated 562.

The information collected from this limited number of cases with reference to the duration of the disease is somewhat startling and emphasizes most forcibly the dread nature of this ailment and the great economic loss resulting therefrom.

The tabulation by counties according to duration of the disease is as follows:

Less than 6 weeks	43
From 6–7 weeks	36
From 8–11 weeks	65
From 12–23 weeks	178
From 6–8 months	165
From 9–11 months	101
One year and over	1001
Not stated	666

The statistics with reference to the number of persons in the family where the tubercular person resides is shown in the following table: Single, 84; One, 128; Two, 202; Three, 284; Four, 266; Five and over, 588; not stated, 703.

The information collected with reference to the number of other persons in the family who have tuberculosis is as follows: None, 1,250; One, 172; Two and over, 51; not stated, 782.

TABLE NO. 16.—SHOWING CASES OF TUBERCULOSIS IN WISCONSIN, BY COUNTIES.

County.	Color.		Age Groups.								Sex.		Occupation.																		
	White.	Other.	0-9	10-19	20-29	30-39	40-49	50-60	60+	Not stated.	Male.	Female.	Not stated.	Book-keeper.	Bar-tender.	Carpen-ter.	Clerk.	Domestic.	Dress-maker.	Engineer.	Farmer.	House-work.	Laborer.	Machin-ist.	Nurse.	Painter.	Sales-man.	School.	Teacher.	None.	Misc.	Not stated.
Adams	1	....	....	....	1	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Ashland	25	4	3	4	11	6	2	2	1	....	16	13	....	....	....	....	1	....	....	....	5	8	3	....	....	....	....	3	....	1	3	5
Barron	36	....	1	5	15	7	5	1	2	....	16	20	....	....	....	....	2	3	....	....	6	11	1	....	....	....	....	3	....	9	1	....
Bayfield	8	....	1	3	2	....	1	....	1	....	5	3	....	....	....	....	....	....	....	....	1	....	2	....	....	....	....	2	1	....	1	1
Brown	71	39	1	16	17	18	12	7	....	39	50	60	....	....	4	2	2	....	2	....	3	14	4	1	1	....	....	10	....	5	12	50
Buffalo	4	....	....	2	....	....	2	....	....	....	2	2	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	1	....	....	....	1
Burnett	9	....	....	....	3	1	1	3	1	....	7	2	....	....	....	....	....	1	....	....	7	....	....	....	....	....	....	....	....	1	....	....
Calumet	11	....	....	1	2	3	3	1	1	....	6	5	....	....	....	....	....	....	....	....	2	4	1	....	....	....	....	1	1	....	2	....
Chippewa	17	....	1	2	9	4	....	....	....	1	9	8	....	....	....	....	....	....	....	....	1	2	....	....	....	1	....	2	....	9	....	2
Clark	22	....	1	3	9	5	1	....	1	2	12	10	....	....	....	....	2	1	....	....	5	6	....	....	....	....	....	....	....	1	1	6
Columbia	26	3	....	4	10	5	3	2	1	4	16	13	....	....	....	....	1	....	....	....	7	8	1	....	....	....	....	3	1	3	3	2
Crawford	15	....	....	....	5	3	5	1	....	1	6	9	....	....	....	2	....	1	....	....	3	7	1	....	....	1	....	....	....	....	....	....
Dane	71	....	5	10	26	15	7	1	3	4	40	31	....	....	....	1	3	1	....	1	12	17	4	....	....	1	....	7	1	1	6	16
Dodge	40	....	....	3	9	13	9	1	2	3	24	16	....	....	....	....	....	3	1	....	4	7	1	....	....	1	2	1	1	2	11	6
Door	6	....	....	....	3	2	....	....	....	1	3	3	....	....	....	....	....	1	....	....	1	1	1	....	....	....	....	....	....	....	....	2
Douglas	25	....	....	5	11	4	1	....	3	1	15	10	....	....	1	....	1	....	....	....	....	7	3	....	....	....	....	1	....	2	6	4
Dunn	27	....	1	6	6	7	4	2	1	....	12	15	....	....	....	....	2	1	....	....	4	10	1	....	....	....	....	1	....	1	4	3
Eau Claire	88	....	1	19	22	25	10	5	5	1	33	44	11	....	....	3	2	4	....	....	2	26	12	....	1	....	4	8	5	7	4	10
Florence	1	....	....	....	1	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....
Fond du Lac	50	....	1	4	16	14	5	2	1	7	19	30	1	2	....	1	1	8	1	1	6	8	3	....	....	....	1	1	....	5	10	2
Forest	1	....	....	....	1	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....
Grant	30	....	1	....	8	14	3	....	1	3	14	16	....	1	2	1	....	....	....	....	5	8	....	....	....	....	....	....	1	4	....	8
Green	20	....	1	2	7	6	1	1	....	2	13	7	....	....	....	1	....	....	....	1	1	8	3	....	....	....	....	3	1	1	1	1
Green Lake	9	....	....	2	....	1	....	....	....	6	4	5	....	....	....	1	....	....	....	....	....	2	....	....	....	....	....	1	....	3	1	1
Iowa	18	....	1	1	4	8	2	2	....	....	8	10	....	....	....	....	....	1	....	....	3	7	....	....	....	....	....	....	....	4	3	....
Iron	8	....	2	3	1	1	....	1	....	....	5	3	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	3	1	1	....	1
Jackson	5	....	....	1	2	1	....	1	....	....	2	3	....	....	....	....	1	....	....	....	....	1	....	....	....	....	....	....	....	1	1	1
Jefferson	30	....	....	3	11	7	2	3	1	3	14	16	....	....	....	1	....	....	....	....	....	11	4	....	....	....	....	2	....	3	5	4
Juneau	9	....	....	1	2	....	4	....	....	2	6	3	....	....	....	1	....	....	....	....	3	2	....	....	....	....	....	....	....	1	....	2
Kenosha	89	....	8	15	28	13	6	1	3	15	70	19	....	....	....	....	3	2	1	1	2	16	4	....	....	1	....	12	....	6	....	41
Kewaunee	6	....	....	....	1	2	3	....	....	....	3	3	....	....	....	....	....	....	....	....	1	2	1	....	....	....	....	....	....	....	....	2

La Crosse.....	19	....	....	1	7	7	2	1	1	....	11	8	....	....	....	....	....	1	....	....	1	5	1	....	....	1	....	....	....	2	....	8
Lafayette ...	23	....	....	....	9	0	5	1	3	....	5	13	5	....	....	....	1	1	....	....	8	4	1	....	....	....	....	2	....	....	....	6
Langlade	13	....	....	1	4	4	....	....	....	4	4	7	2	....	....	....	....	....	....	....	2	7	....	....	....	....	....	....	1	1	....	2
Lincoln	4	....	....	....	2	2	....	....	....	....	1	3	....	....	....	....	....	....	....	....	....	4	....	....	....	....	....	....	....	....	....	....
Manitowoc ...	37	....	2	4	6	12	5	1	....	7	18	19	....	....	....	....	1	1	....	....	3	8	4	....	....	....	....	5	1	2	6	6
Marathon	26	....	1	1	8	11	2	3	....	....	11	15	....	1	....	....	1	1	....	....	2	8	3	....	....	....	....	3	3	3	1	....
Marinette	19	....	....	5	7	3	2	2	....	....	9	10	....	....	....	....	1	....	....	....	2	2	....	....	....	....	1	....	....	....	6	7
Marquette	2	....	....	1	....	....	....	1	....	....	1	1	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....
Milwaukee	462	4	8	55	93	112	57	41	13	87	272	194	....	3	4	3	7	4	6	5	6	72	32	7	1	3	2	24	3	34	78	172
Monroe	23	....	1	1	3	3	1	1	2	11	14	6	3	....	1	....	....	1	....	....	4	12	....	....	....	....	....	....	....	2	1	2
Oconto	22	....	1	3	6	5	5	2	....	....	10	12	....	....	....	....	....	3	....	....	2	7	3	....	1	....	....	1	....	....	....	5
Oneida	32	....	1	6	10	6	7	2	....	....	23	9	....	1	2	1	....	....	....	....	3	6	6	....	1	....	....	5	....	1	5	1
Outagamie ...	36	....	1	7	15	6	7	....	....	....	13	23	....	1	1	....	4	4	....	....	2	6	1	....	....	....	....	5	2	6	3	1
Ozaukee	10	....	1	2	5	1	....	1	....	....	6	4	....	....	....	....	2	....	....	....	1	....	2	....	....	....	....	....	....	....	2	3
Pepin	1	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....
Pierce	16	....	....	1	4	6	4	1	....	....	6	10	....	....	....	....	....	....	....	....	7	6	....	....	....	....	....	1	1	....	....	1
Polk	24	....	1	7	5	6	2	1	2	....	10	13	1	....	....	....	1	....	2	....	4	5	1	....	1	....	1	3	....	2	3	1
Portage	11	....	....	2	2	3	3	1	....	....	4	7	....	....	....	....	....	....	1	....	7	2	....	....	....	....	....	....	....	1	....	....
Price	7	....	1	....	3	1	1	1	....	....	5	2	....	1	....	....	....	....	....	....	....	2	1	....	....	....	....	1	....	....	1	1
Racine	120	....	4	23	31	8	10	6	1	37	59	61	....	....	....	1	2	1	....	....	1	15	3	1	....	2	....	1	....	11	12	70
Richland	12	....	1	2	4	1	2	1	1	....	5	7	....	....	....	....	....	....	....	....	4	4	....	....	....	....	....	....	....	3	....	1
Rock	79	....	1	9	24	20	11	1	6	7	36	43	....	....	....	....	1	....	....	....	7	18	13	3	2	....	....	8	....	16	8	3
Rusk	1	....	....	1	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
St. Croix.....	14	....	....	4	4	2	3	....	....	1	7	7	....	....	....	....	....	2	....	....	3	4	1	....	....	....	....	1	....	....	....	3
Sauk	12	....	....	....	....	6	3	....	....	3	6	6	....	1	....	....	....	1	....	....	3	4	....	....	....	....	....	....	....	1	1	1
Sawyer	5	....	....	1	2	1	....	1	....	....	5	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	....	3
Shawano	21	43	4	22	13	14	6	1	1	3	30	33	1	1	....	1	....	....	....	1	8	12	4	....	....	....	....	2	....	25	....	10
Sheboygan ...	37	....	....	12	8	6	3	2	1	5	19	17	1	1	....	....	2	....	2	....	4	8	1	....	....	....	....	2	....	2	....	15
Taylor	3	....	....	....	1	2	....	....	....	....	....	3	....	....	....	....	....	....	....	....	....	3	....	....	....	....	....	....	....	....	....	....
Trempealeau..	9	....	....	1	3	1	3	1	....	....	2	7	....	....	....	....	....	....	....	....	2	6	....	....	....	....	....	1	....	....	....	....
Vernon	27	....	....	2	7	5	7	1	2	3	4	14	9	....	....	....	....	....	....	....	4	10	1	....	....	....	....	3	....	3	....	6
Vilas	7	....	1	2	1	2	1	....	....	....	3	4	....	....	....	....	....	....	....	....	....	3	....	....	....	....	....	3	....	....	....	1
Walworth	23	....	1	2	8	6	3	1	....	2	12	10	1	....	....	....	1	1	....	....	3	5	....	....	1	....	....	1	....	2	5	4
Washburn	3	....	....	1	1	....	1	....	....	....	1	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	2	....
Washington ..	30	1	2	4	8	7	6	2	1	1	18	13	....	....	....	....	1	2	....	....	11	5	....	1	....	....	2	....	1	4	2	1
Waukesha	23	....	1	2	9	4	1	3	2	1	8	15	....	....	....	....	....	....	....	....	3	5	3	....	....	....	....	1	....	4	1	6
Waupaca	21	....	....	2	8	8	2	....	1	....	12	9	....	....	....	....	1	1	....	....	5	3	1	....	1	2	....	....	....	1	2	4
Waushara	12	....	2	2	4	2	1	....	....	1	6	6	....	....	....	....	....	....	....	....	4	2	....	....	....	....	....	1	....	2	1	2
Winnebago ...	111	....	13	15	20	17	4	3	1	38	55	56	....	....	....	....	2	1	1	....	7	16	12	....	....	2	1	18	....	7	5	39
Wood	26	....	3	4	8	4	6	1	....	....	8	18	....	....	....	....	....	....	....	....	3	7	....	....	....	....	....	1	....	9	2	4
Total ...	2,161	94	80	328	596	489	268	121	66	307	1,150	1,069	36	13	17	18	49	52	17	10	212	484	147	13	10	15	14	158	26	215	223	562

TABLE NO. 16—Continued.—SHOWING CASES OF TUBERCULOSIS IN WISCONSIN BY COUNTIES.

County.	Duration of Disease.								Number in Family.							No. Others in Family with Disease.			
	—6 weeks.	6-7 weeks.	8-11 weeks.	12-23 weeks.	6-8 months.	9-11 months.	1+ years.	Not stated.	Single.	1	2	3	4	5+	Not stated.	None.	1	2+	Not stated.
Adams								1							1				1
Ashland		1	1	4	3	1	10	9		7	3	5	1	5	8	10			19
Barron		1	1	6	2	4	18	4	1	1	3	7	3	16	5	28	2		6
Bayfield				2		1	5				1	1	1	5		3	2	2	1
Brown			2	4	3		52	49		1	3	9	10	37	50	10	10		90
Buffalo					1		3						1		3	2	1		1
Burnett							9							7	2	6			3
Calumet					1	1	8	1				6	3	2		8	2		1
Chippewa		1	1		1	1	8	5	5	2	1				9	2	1		14
Clark					4	3	6	9			1	3	4	8	6	17	2	3	
Columbia	1	3	2	1			7	10	5	2	1	6	6	6	4	4	21			8
Crawford	1			1		1	8	4			2	4	4	5		12			3
Dane	6	4	1	3	2	1	34	20	10	7	6	7	7	13	21	38	7		26
Dodge				6	6	1	22	5		4	2	7	8	8	11	22		1	17
Door			1	2			1	2			1	1	1	2	1	3	1		2
Douglas			1	3	4		10	7	1	3	2	4	2	7	6	13	2	3	7
Dunn		1			2	1	22	1			3	3	4	12	5	19	3	3	2
Eau Claire	3	2	4	7	8	1	56	7		3	7	11	11	42	14	21	6		61
Florence								1							1	1			
Fond du Lac		1	1	4	5		32	7	6	11	7	11	5	5	5	32	10	2	6
Forest							1					1				1			
Grant				4	1		17	8		1	7	8	7	6	1	27			3
Green			1	3	3	2	5	6	1	2	2	2	2	7	4	15			5
Green Lake		1		1	2		4	1			2	5		2		8			1
Iowa			1		2	1	13	1	1		1	3	8	4	1	11	3	2	2
Iron				1			1	6				1			7	8			
Jackson				2		1	1	1				1			4	2	1		2
Jefferson	1		2	3	3	4	15	2		4	5	5	7	4	5	25	1		4
Juneau				1		1	4	3			2		1	3	3	6			3
Kenosha	1			5	2	2	40	39		1	8	7	9	22	42	48	13		28
Kewaunee			1		2	1	1	1	1			1		3	1	1	2		3

La Crosse	1	.....	.....	3	1	1	10	3	.....	.....	3	.....	6	7	3	5	3	6	5
Lafayette	1	1	.....	2	3	4	12	.....	3	10	1	.....	3	3	3	18	1	.....	4
Langlade	.....	.....	.....	1	.....	3	.....	9	.....	1	1	2	.....	8	1	10	1	.....	2
Lincoln	.....	.....	1	1	1	.....	1	.....	.....	.....	.....	.....	4	.....	.....	3	.....	.....	1
Manitowoc	.....	.....	1	4	4	1	11	16	8	3	2	6	8	4	6	22	2	.....	13
Marathon	....	.....	1	4	4	6	11	.....	3	2	.....	4	5	11	1	25	.....	.....	1
Marinette	.....	.....	.....	.....	4	.....	8	7	.....	.....	.....	4	2	9	4	11	2	.....	6
Marquette	.....	1	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	1	1	.....	.....	1	1
Milwaukee	11	6	13	26	28	14	141	227	17	20	34	35	29	64	267	200	40	14	212
Monroe	.....	1	.....	4	.....	.....	13	4	1	1	4	7	5	4	1	19	2	.....	2
Oconto	.....	.....	2	1	1	.....	6	12	.....	7	.....	1	2	12	.....	17	.....	.....	5
Oneida	.....	.....	3	4	5	2	18	.....	5	2	6	6	7	5	1	26	4	.....	2
Outagamie	2	.....	2	9	3	.....	18	2	.....	1	2	5	9	15	4	29	4	.....	3
Ozaukee	.....	.....	.....	3	2	1	3	1	.....	.....	4	1	.....	2	3	5	.....	1	4
Pepin	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1	.....	.....	.....
Pierce	.....	1	.....	2	2	2	8	1	.....	1	4	2	4	4	1	10	2	.....	4
Polk	.....	.....	.....	.....	.....	2	18	4	.....	.....	2	5	3	6	8	18	.....	.....	6
Portage	.....	.....	.....	2	3	2	4	.....	.....	.....	.....	2	1	8	.....	11	.....	.....	.....
Price	.....	.....	.....	1	1	1	4	.....	.....	.....	1	.....	.....	3	3	3	.....	.....	4
Racine	1	1	1	2	5	7	29	74	.....	4	6	6	7	17	80	40	1	5	74
Richland	.....	.....	.....	1	2	1	8	.....	.....	.....	2	3	2	4	1	9	2	.....	1
Rock	1	1	3	17	5	4	39	9	7	4	13	16	15	19	5	69	7	3	.....
Rusk	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	1	.....	.....	.....
St. Croix	.....	.....	1	3	.....	.....	9	1	1	2	2	2	2	4	1	10	.....	.....	4
Sauk	.....	.....	.....	1	1	.....	8	2	.....	3	1	4	1	3	.....	8	.....	1	3
Sawyer	.....	.....	.....	.....	.....	.....	4	1	.....	.....	1	.....	.....	.....	4	1	.....	.....	4
Shawano	2	2	1	4	1	1	53	.....	2	4	7	11	3	35	2	52	11	.....	1
Sheboygan	1	.....	2	2	1	.....	21	10	1	2	6	2	4	9	13	23	4	.....	10
Taylor	.....	.....	.....	.....	.....	.....	3	.....	.....	2	.....	.....	.....	1	.....	2	.....	.....	1
Trempealeau	.....	.....	.....	.....	1	.....	6	2	.....	.....	2	.....	.....	4	3	5	.....	.....	4
Vernon	.....	.....	.....	4	4	3	16	.....	5	5	2	3	4	8	.....	22	2	.....	3
Vilas	.....	.....	.....	.....	1	.....	2	4	.....	.....	.....	2	1	4	.....	2	.....	.....	5
Walworth	1	.....	1	1	3	1	15	1	.....	.....	5	4	6	5	3	16	6	.....	1
Washburn	.....	1	1	1	.....	.....	.....	.....	.....	.....	1	.....	1	1	.....	3	.....	.....	.....
Washington	.....	1	3	3	7	3	14	.....	.....	.....	4	6	5	14	2	28	.....	.....	3
Waukesha	.....	.....	1	.....	2	2	8	10	.....	2	2	2	4	5	8	13	.....	.....	10
Waupaca	.....	1	.....	1	1	2	13	3	.....	.....	1	3	4	7	6	18	1	.....	2
Waushara	.....	.....	1	1	1	2	3	4	.....	1	.....	1	.....	8	2	7	3	.....	2
Winnebago	8	4	6	5	5	1	29	53	3	1	7	16	8	32	44	45	4	4	58
Wood	1	.....	1	1	5	.....	17	1	.....	2	1	3	6	12	2	23	1	.....	2
Total	43	36	65	178	165	101	1,001	666	84	128	202	284	266	588	703	1.250	172	51	782

ACUTE ANTERIOR POLIOMYELITIS (INFANTILE PARALYSIS.)

Chart No. 14 shows the number and location of cases and deaths from infantile paralysis during the calendar year of 1912.

The distribution of the cases and deaths by counties is shown by Table No. 1.

For the calendar year of 1912, 54 cases and 25 deaths from this disease were reported.

Chart No. 15 shows the number and location of cases and deaths from infantile paralysis during the calendar year of 1913.

The distribution of the cases and deaths by counties is shown by Table No. 2.

For the calendar year of 1913, 79 cases and 25 deaths from this disease were reported.

The mortality rate for 1912, computed from the number of cases and deaths reported, is shown to be nearly 50 per cent, while the rate for 1913 is approximately 25 per cent. The mortality rate for both years is entirely too high and is due to the very incomplete report of cases. On account of difficulty in making an early diagnosis, undoubtedly, many of the cases were diagnosed at first as meningitis, and the real nature of the disease was not determined until evidences of paralysis became manifest.

On account of the complexity of this problem as it presents itself to the average practitioner, we consider it advisable to present the following brief statement showing the latest developments in the study of this dread disease. For a complete statement of the epidemiology, symptoms and diagnosis of infantile paralysis see special bulletin prepared for the board by Dr. G. W. Henika, Deputy State Health Officer for District No. I.

Acute anterior poliomyelitis was experimentally produced in monkeys as early as 1909. In 1913 various experiments were made to show the possibility of transmitting the disease by the agency of flies. As a result of the extensive work which has been done on the experimental disease in monkeys, many important facts have been obtained. By inoculating well monkeys through the nasal mucous membrane from the nasal secretion of a monkey suffering with the disease several investigators have

been able to produce anterior poliomyelitis in the majority of cases experimented upon. It has also been demonstrated that flies, which have been permitted to bite a sick monkey, will communicate the disease to well monkeys when there is no possibility of infection from any other source.

At the present time there is undoubted evidence that the infecting agent belongs to the group of so-called filterable viruses. The virus of poliomyelitis is highly resistant to many destructive measures. It has been proven that freezing for forty days does not materially affect the virus, but heating to a temperature of 45 or 50 degrees Centigrade for one-half hour will kill the disease germs. The virus is readily destroyed by a one per cent solution of hydrogen peroxide, by menthol, and by corrosive sublimate. In monkeys one attack of the disease prevents a second successful inoculation. Experimenters agree that very satisfactory results have been obtained in producing active immunity in animals by repeated injections of small amounts of attenuated virus, but the results have not warranted the application of this procedure to man.

Wickman, in 1905, was the first investigator to draw special attention to the contagious character of this disease. It was this investigator also who first recognized the abortive type. The recognition of this form of the disease, namely, cases where no paralysis appeared, may aid materially in determining the mode of transmission in certain more or less isolated cases. That the virus or cause of the infection finds a considerable degree of resistance present in every individual is proven by the frequent tendency of the paralyzed types to appear as isolated cases in a single family, while the other cases in the same family are often of the abortive type, that is, cases where no paralysis appears.

Lovett has prepared the following table showing the number of cases reported and number of outbreaks by five year periods since 1880:

Years	Cases	Outbreaks
1880–1884	23	2
1885–1889	93	7
1890–1894	151	4
1895–1899	345	23
1900–1904	349	9
1905–1909	8,054	322

These figures show the enormous increase in the epidemic prevalence of poliomyelitis from 1905 to 1909, although it is fair to

assume that the cases were much better reported and more often recognized during this five year period than formerly.

Wickman differentiated eight different types or forms of the disease as follows:

1. The spinal, poliomyelitis form.
2. The ascending or descending type of paralysis, simulating Landry's paralysis.
3. The bulbar or pontine form.
4. The encephalitic form.
5. The ataxic form.
6. The polyneuritic form, closely resembling cases of multiple neuritis.
7. The meningeal type.
8. The abortive type.

The incubation period of acute anterior poliomyelitis is found to vary from three to six days in monkeys experimentally inoculated. The length of incubation in human beings has not been definitely determined. Approximately from two to ten days has been accepted as the most usual period, but apparently great variation has occurred, the period sometimes extending to three weeks or more.

SYMPTOMS.

Definite prodromal symptoms are relatively rare. Some cases give a history of malaise, weakness, digestive disturbances, (nausea, constipation or diarrhea), angina or restlessness usually preceding, by several days, the definite onset of the acute febrile stage. Bronchitis, coryza and tonsilitis more rarely precede an attack of acute anterior poliomyelitis. Sometimes the disease develops in two stages. After the first slight prodromal symptoms, the patient apparently recovers completely in a few days, and may return to the usual routine of his daily work, but a few days later is stricken down by an attack of poliomyelitis. Wickman expresses the suspicion that these cases may be relapses brought on by exertion, and may illustrate the therapeutic value of *rest,* after even a mild attack of the disease. Many cases are never reported or recognized until paralysis is discovered. As such cases have most commonly occurred in children, it is quite probable that in many instances a mild febrile stage has been overlooked.

ONSET.

The onset of this disease is usually quite abrupt, suddenly prostrating persons in apparently good health. A sudden, sharp

rise of temperature is probably the most common feature, a definite chill is rare. The disease with which it may be most commonly confused are the mild types of meningitis, acute neuritis, gastroenteritis and tonsilitis. Different epidemics seem to vary in this respect, some will show the gastrointestinal involvement in nearly every case, while others show the cerebral type.

GENERAL SYMPTOMS.

Fever is the most constant symptom, although it is well established that some cases run their course without fever. The rise of temperature is usually quite sharp, often reaching its maximum within thirty-six hours. The range of temperature varies, running from one hundred to one hundred four degrees; higher temperatures, one hundred five to one hundred six degrees, have occasionally been seen. Wickman considers the height of the temperature no index to the severity of the infection. Abortive cases, running a short course, may develop as high temperature as cases resulting in extensive paralysis or death. The fever usually continues from one to seven days, usually falling to normal about the time paralysis develops.

Headache is complained of by a large majority of those who are old enough to accurately describe their sensations. Wickman's observations lead him to consider the headache usually occipital, but other observers have found it more commonly general or frontal. The headache is usually moderately severe, but occasionally is very intense, constituting the most prominent symptoms.

PROSTRATION.

When the onset is sudden and acute, there is marked prostration from the first. Even with mild constitutional symptoms, the prostration is often much greater than would be expected. Extreme weariness and muscular weakness are characteristic features of many mild abortive cases.

DIGESTIVE SYSTEM.

Some disturbance of digestion is among the most common early symptoms. Constipation is the most usual derangement, although diarrhea is very common in some epidemics. Nausea and vomiting are quite common early in the disease and usually subside in a few days. Accompanying constipation, abdominal distention is frequently seen.

RESPIRATORY SYSTEM.

Catarrhal conditions of the respiratory system are rare, a point emphasized by Wickman as an aid in the early differentiation of acute poliomyelitis from influenza, which it often resembles in many respects. Sore throat is fairly common in some epidemics but is not in general a prominent symptom; broncho-pneumonia may develop late in the disease due to paralysis of the respiratory muscles.

URINARY SYSTEM.

The urinary system is not commonly involved, although on post mortem the kidneys are sometimes found congested, with varying degrees of paranchymatous degeneration. Albuminuria is rare. Retention of urine occurs occasionally. Incontinence of urine is more rare.

CIRCULATORY SYSTEM.

The heart shows the usual derangement common in other acute infections; vaso-motor disturbances are sometimes observed but are not characteristic.

THE SKIN.

Excessive sweating has been spoken of by Muller as a characteristic early symptom. While this has been noted by other observers, it is not a constant symptom. Skin eruptions have been noted by some authors. However, no skin eruption can be said to be at all characteristic of acute poliomyelitis.

NERVOUS SYMPTOMS.

Restlessness or irritability is a very common and marked symptom. In children, very often the first symptoms to attract attention is their irritability. Older persons frequently show an eary stage of excitement, with extreme restlessness, vague anxiety and mental disturbance out of all proportion to the severity of the symptoms. This period is frequently followed by an apathetic or drowsy state, especially in children. A child will sometimes lie a day or more partially or fully asleep; but when aroused, the faculties are usually clear. Coma is rare, the patient usually retains consciousness throughout the illness, even in the fatal cases. Delirium is not uncommon, but occurs early and is usually of short duration. Convulsions sometimes occur in children.

PAIN.

Pain of some sort is a very constant symptom. The most characteristic pain is in the back of the neck and spine; the entire spinal column may be painful and very tender, especially upon motion. The pain in neck and back is sometimes extremely severe. Pain is commonly complained of in arms and legs, sometimes in the face, less commonly in the trunk. These pains sometimes resemble a myalgia without cutaneous hyperesthesia or tenderness over nerve trunks. In other cases the clinical picture is that of neuritis with marked hyperesthesia over nerve trunks. This tenderness over the nerve trunks may persist for weeks.

MENINGITIS SYMPTOMS.

Pain in the neck of varying degrees of intensity is quite common, stiffness of the neck is another quite common symptom, and less frequently retraction of the head, due to actual contraction of the posterior neck muscles. If the meningitic symptoms are severe, the differentiation from cerebrospinal meningitis may be impossible without miscroscopical examination of the spinal fluid.

MOTOR SYMPTOMS.

Before the onset of paralysis, as well as in cases which do not result in paralysis, disturbance of the motor centers may be indicated by muscular twitching, jerking of the limbs, or tremor. The patellar reflex is quite commonly exaggerated in the early stages, but is almost always diminished or abolished prior to the onset of paralysis. It may be abolished on one side and exaggerated on the other. Reflexes other than the patellar have not been studied closely or extensively enough to warrant definite generalization.

Briefly summarizing the symptoms as enumerated, the characteristic features of acute anterior poliomyelitis in the early stage are sudden onset with fever; gastro enteric disturbances (vomiting, diarrhea or constipation); occasionally sore throat; headache; restlessness followed often by apathy; pains in the neck, back and limbs; muscular twitchings; exaggeration or abolition of tendon reflexes. Symptoms of mild meningitis are present in a varying proportion of cases, and when present are rather characteristic. The clinical picture, prior to the onset of paralysis, may be that of an indefinite general infection or

toxemia, gastroenteritis, tonsilitis, multiple neuritis, menengitis or encephalitis.

DIAGNOSIS.

Except in rare cases, the diagnosis offers no great difficulties after the onset of paralysis. The sudden onset of flaccid paralysis of one or more extremities, without loss of sensation, during or immediately following an acute febrile disturbance, is sufficiently characteristic. The rapid regression of paralysis of some of the parts, and atrophy of those muscles which remain paralyzed, complete the diagnosis. It is important to make the diagnosis, whenever possible, before the onset of paralysis, as well as in cases where no paralysis develops. This is not only of great importance for the success of prophylactic measures, but in the event of the discovery of any specific line of treatment, it will be necessary to employ it early. Any acute febrile illness of sudden onset, showing gastrointestinal disturbances and symptoms of a mild meningitic inflammation or other nervous symptoms such as hyperesthesia, pain in the limbs, exaggerated or abolished tendon reflex, ataxia, tremor, etc., warrants the suspicion of poliomyelitis. The diagnosis in such cases may be reasonably certain if the disease is prevalent in the community.

TREATMENT.

No specific treatment has been developed. The treatment in the acute stage must therefore be symptomatic. Rest is very important, and even in the mildest cases, should be enforced. Moderate purgation is recommended, using enemata if necessary. Diuresis should be promoted by the free administration of water, or by saline enemata. Hot packs are recommended to promote diaphoresia, and to relieve restlessness and pain. The diet should be liquid, nutritious and easily digestible. Urotropin, in varying dosage, is recommended by various authors; antipyretics and analgesics are to be avoided as much as possible; codeine may be given when necessary to allay pain; lumbar puncture to relieve symptoms of pressure may be made under strict aseptic precautions, but should not be undertaken by the inexperienced.

The effect of any treatment in the acute stage is extremely difficult to ascertain. Independently of any treatment, cases with severe early symptoms may recover in a few days without paralysis, while other cases with less severe initial symptoms may result in extensive paralysis or death.

In view of the latest discoveries regarding the part played by the mucous surfaces of the nasopharyngeal tract, frequent gargles and spraying of these surfaces with a one per cent solution of peroxide of hydrogen is advisable.

The treatment of the resulting paralysis after all acute symptoms have passed will not be taken up in this article as there are still wide differences of opinion regarding the effectiveness of the various methods employed. However, massage properly directed and faithfully carried out seems to promise the greatest rewards when coupled with active movement or muscle training.

PROPHYLAXIS.

In view of the almost overwhelming evidence of the communicability of acute poliomyelitis, the use of some form of preventative measure is imperative.

The patient should be isolated in a clean room with as little furniture as possible, well screened and kept from insects. All persons, except the physician and nurse, should be prohibited from coming in contact with the patient. All discharges, as well as all articles used in caring for the patient should be thoroughly disinfected before they leave the sickroom. The nurse and physician should observe the same precautions regarding their hands and clothing as in attending a case of scarlet fever. A gargle and nasal spray of a one per cent solution of hydrogen peroxide should be used. As soon as practical after the recovery of a patient, the house should be fumigated with formaldehyde. If vermin are present it would be advisable to use sulphur also, as well as the formaldehyde.

QUARANTINE.

The rules of the State Board of Health provide that it shall be the duty of the health officer of every board of health in this state, where a case of anterior poliomyelitis is found to exist, or supposed to exist, to establish and maintain quarantine for at least three weeks from the beginning of the disease and until the patient and premises have been thoroughly fumigated and disinfected as provided for in Section 1416—17 of the statutes. (The room or bed and all excreta from the patient should be carefully screened from flies. Flies carry the contagion.)

(For charts showing distribution of cases, see pages 159-60.)

VENEREAL DISEASES.

Not more than fifteen years ago social diseases, commercialized vice, prostitution and so on were subjects to be discussed only by science. They were absolutely tabooed as topics of conversation for the general public, and those who dared to discuss them freely were thought of as indecent and unfit.

Suddenly the tide turned and people began to realize that secrecy was the richest of soil in which vice and immorality could grow. Magazines and newspapers burst forth with startling headlines concerning existing conditions of the social evil; the pulpits were filled with people eager to enlighten the public; the schools started a vigorous campaign for the teaching of sex hygiene; the theater devoted much time to producing plays dealing with vice problems; parents seemed to awaken to the realization that children, in very tender years, must have a clear knowledge of life; legislators got busy in passing laws against vice; commissions for the investigation of prostitution sprang up over night; and so on we might continue for pages.

At last we have realized that sex immorality in any form is one of the most important problems that modern civilization has to deal with. The essence of the recognition that vice must be annihilated is that we have at last realized thoroughly that sexual immorality is not necessary in order to develop strong men and women, but quite the contrary. Vice has become commercialized, has been promoted and furthered, and has become a gainful occupation. Therefore, it has been stimulated, not to gratify the demands of the public but rather to increase the pocketbook of those people who wish to make a gainful business of it. As Prof. E. A. Ross has said, "You have a business which stimulates the demand for its goods just as dry-goods merchants stimulate the demand for dry-goods by shop window trimming, by models, by advertising and everything of this kind." With these facts in mind it would seem that our slogan should be "annihilate prostitution in every conceivable form".

The table of venereal diseases tabulated by the State Board of Health from the data which was reported by various physicians throughout the state seems to work out almost exactly with public opinion so frequently voiced concerning this subject. The reports received by the State Board of Health have been inexcusably small. From them, however, there is sufficient data to

tabulate, but our conclusions are mere assumptions and our statements must be worked out on this basis; namely, if we had tabulated 20,000 cases instead of approximately 1,000 cases, that the result would have been the same. Of course, 1173 cases of venereal diseases are not a very large proportion of the whole number, but they are probably typical cases and very indicative of the true situation. So far, there have been 1,173 cases of venereal diseases reported to the State Board of Health. Out of this number 892 are Gonorrhea and 281 are Syphilis. Of the 892 cases of Gonorrhea, 665 are reported as single and 227 as married; 726 are reported as male and 166 as female. Of the 281 cases of Syphilis reported, 137 are married and 144 are single; 198 are male and 83 are female.

The fact that 599 cases of Gonorrhea are reported as being acute and 293 as being chronic is of little significance for the medical world has shown that within a very short period of time all acute cases of Gonorrhea become chronic unless very carefully and properly treated. It is safe to say that from twenty-five to forty per cent of Ophthalmia Neonatorum, or Infantile Blindness is directly due to Gonorrheal infection.

The age at which venereal diseases seem to appear most frequently is from nineteen to twenty-nine. This, too, is the age at which most of our marriages occur. When we find these diseases contracted more frequently at this marriageable age, is this not proof that a eugenics law should be rigidly enforced—a law which compels both men and women to present a certificate of health before entering the state of matrimony?

Society is horrified at the mating of criminals, of insane persons, of idiots and of epileptics; yet we permit the mating of people afflicted with a disease which may bring forth any of the above mentioned conditions. There is certainly no more deadly foe to the home and institution of a family than prostitution. There is no destroyer of the home and family that works with more force and power and vigor, or that strikes with a surer blow than the venereal diseases. There are no diseases which so incapacitate man physically, morally and mentally as Gonorrhea and Syphilis, and there is no disease germ so inherited with all its virulence as Syphilis. The majority of all surgical operations upon the generative organs are made necessary from gonococcus infection, and ninety per cent of the cases of senile paralysis in our asylums give the Wasserman reaction of syphilis.

Yet, in the face of these facts, we stand by and permit the marriage of people thus afflicted; in other words, we watch our insane asylums grow, our prisons extend, and our paupers increase! The class that includes the epileptics, idiots and insane grows on ad infinitum, and yet we wonder why industrial, economic, and social conditions seem to grow worse instead of better!

It is interesting to note that in the cases of both Gonorrhea and Syphilis there were approximately four times as many infected by illicit intercourse as by prostitution. This would almost seem a just plea for segregation and regulated districts, but to quote the Philadelphia Vice Commission:

"Segregation is ineffective—it segregates a small minority of the sexually vicious, can never isolate their diseases, and promotes rather than reduces clandestine prostitution; it is confiscatory—lowering values of properties for reputable purposes; it is anti-social—forcing the families of the poor into evil associations; it is uneconomic—raising a crime to the dignity of a business through concentration, combination, and publicity; it is unethical—promoting the double standard of morality by the erection of a female lazaretto; it is mal-administrative, requiring official complicity in and partnership with an illegal pursuit to the sure debauching of police morals; it is inhuman—resting upon the assumption that prostitution is a natural and ineradicable feature of society." And again, "If the social evil be necessary, it is not an evil, and if it is evil, it is not necessary."

The further we progress in civilization the more careless we grow concerning certain matters of health. This seems due to the fact that medicine has progressed by such leaps and bounds that it takes care of practically all departments of health and says to the public, "Do as you please and I will take care of the evils that follow." We have found out how to prevent Smallpox; instead of people being vaccinated and thus avoiding the disease, they deliberately run the risk of catching it because they expect no evil results from the mild type that now exists.

So it is with venereal diseases. Medicine has at last hit the path which seems to lead to the cure of these diseases, and so, in turn, we are becoming as careless concerning them as we are now concerning Diphtheria, Typhoid Fever or Smallpox.

The problem of sex immorality cannot be met by simply abolishing red-light districts, by wiping out commercial vice, by finding a cure for the venereal diseases or by passing eugenics laws. Of course, such action will undoubtedly mean a finer race, a more normal mind and a more perfect body for society to work with, but the sex instinct remains unaltered and will, in turn, seek an outlet in the future as it has in the past.

So it would seem that two things must happen—first, the adult public must be made to realize the ravages of vice and immorality; the weaker, less efficient race that they produce; the enormous loss, poverty and crime; the dependence and wrecked lives of innocent men, women and children that ensue; secondly, the child must be carefully guided and instructed by the parents at or before the period of adolescence concerning the problems of sex.

It is to be hoped that if public opinion so agitated at present concerning this problem continues in the future with as much force, that in at least fifty years commercialized vice and prostitution will be unknown.

TABLE SHOWING VENEREAL DISEASES IN WISCONSIN REPORTED TO THE BOARD OF HEALTH BY PHYSICIANS OF THE STATE FOR THE YEAR ENDING JUNE 30, 1914.

	Conjugal State		Sex.		Color.			Nature of disease.	
	Married.	Single.	Male.	Female.	White.	Black.	Indian	Acute.	Chronic.
Gonorrhea.....	277	665	726	166	888	1	3	599	293
Syphilis.....	137	144	198	83	280	0	1	115	166

AGE GROUPING.

	1-4	5-9	10-19	20-29	30-39	40-49	50-59	60-69	Unknown
Gonorrhea.....	5	1	96	536	191	38	9	4	12
Syphilis.....	3	4	19	130	69	30	9	3	14

DURATION.

	Under 1 wk.	1-3 wks.	1-5 mos.	6-11 mos.	1-9 yrs.	10-19 yrs.	20-30 yrs.	30-40 yrs.	Unknown
Gonorrhea.....	66	159	300	52	164	11	1	0	139
Syphilis.....	0	63	39	18	117	21	4	0	76

MODE OF INFECTION,

	Prostitute.	Conjugal relation.		Public toilet.	Illicit intercourse.	Inherited.	Unknown	Other.
		H.	W.					
Gonorrhea.....	110	28	7	1	406	4	332	4
Syphilis.....	34	16	0	0	89	6	124	3

ANTITOXINS AND SERUMS.

Acting under the authority granted by Chapter 140, of the Laws of 1907, the State Board of Health has continued during the past two years to distribute diphtheria antitoxin to local boards of health for the prevention and cure of diphtheria. The antitoxin is obtained from the Alexander Antitoxin Company of Marietta, Pa. and a supply to local boards of health or other persons, whether indigent or not, at the rate of fifty cents per thousand units and ten cents additional for each syringe. Under this plan the 1000 unit packages which are used to prevent diphtheria if a person has been exposed to the disease, will cost fifty cents; the 3,000 unit packages will cost $1.30 and the 5,000 unit packages will cost $2.10. The local distributing stations which were established by the State Board of Health in all of the principal cities and in other places so as to make the antitoxin as accessible as possible, have been continued during the past biennal period.

The following table shows the amount of diphtheria antitoxin distributed by months during the calendar year of 1912:

The following table shows the amount of diphtheria antitoxin distributed by months during the calendar year of 1913.

	1000 units	3000 units	5000 units
January	33	23	33
February	43	46	40
March	28	18	43
April	23	24	14
May	22	21	22
June	25	10	15
July	11	5	6
August	38	42	33
September	46	29	48
October	41	14	23
November	28	6	22
December	51	41	39
	379	279	338

The following table shows the amount of diphtheria antitoxin distributed by months during the calendar year of 1913.

	1000 units	3000 units	5000 units
January	254	75	162
February	107	38	59
March	67	36	80
April	15	9	28
May	32	27	24
June	33	23	39

July	45	36	25
August	21	8	13
September	11	26	35
October	32	20	28
November	51	41	39
December	117	67	95
	977	406	637

SMALLPOX VACCINE.

The State Board of Health now distributes smallpox vaccine to all the physicians of the state at the rate of 6.5 cents for each outfit. Either glycerinated ivory points or capillary tubes can be obtained at the same price of 6.5 cents each. This vaccine is sent direct to the physician who orders the same and is not handled by the local distributing stations where the diphtheria antitoxin is kept. The collections for this material are made by the Alexander Company upon bills rendered to the company by the antitoxin department of the State Board of Health.

Tetanous antitoxin is supplied to physicians of the state in the same manner as smallpox vaccine at the following rates: 1,500 units, $1.80; 3,000 units, $3.00; 5,000 units, $4.50.

PASTEUR TREATMENT FOR THE PREVENTION OF RABIES.

During the period from July 1, 1912 to June 30, 1914 only twenty-one Pasteur treatments for the prevention of rabies were given at the State Laboratory of Hygiene. The following is a tabulation of the cases treated by months:

July 1912	5
August 1912	5
September 1912	8
November 1912	2
March 1914	1

No treatments for the prevention of rabies were given at the laboratory during 1913. Comparing this report with the report of 228 persons treated during the last biennial period, it is evident that there has been a very marked decline in the prevalence of rabies in Wisconsin during the past two years. This very desirable situation is due almost entirely, in our opinion, to a better understanding on the part of the public of what must be

done to prevent outbreaks of this dread disease. The muzzling ordinances which have been strictly enforced in practically every locality where a case of hydrophobia develops, prevent any further spread of the infection among dogs or other animals. Experience teaches that the enforcement of an ordinance requiring the muzzling of all dogs is the only effective means of controlling the spread of rabies. In England where muzzling ordinances are strictly enforced, no cases of rabies in man or the lower animals have been reported for a number of years.

INFANTILE BLINDNESS.

In compliance with the authority granted by the statutes, the State Board of Health adopted and published in the official state paper on October 9, 1913, the following rules relating to the prevention and control of ophthalmia neonatorum or infantile blindness:

"Any physician, midwife, nurse or other person in attendance on a confinement case, shall, within two hours after the birth of a child, use one of the following prophylactic treatments for the prevention of infantile blindness or ophthalmia neonatorum.

"1. Two drops of a one per cent fresh solution of nitrate of silver to be dropped in each eye after the eyelids have been opened.

"2. Two drops of a 25 per cent solution of argyrol or two drops of a 5 per cent solution of protorgal should be dropped in each eye in the same manner as when silver nitrate is used. (Nitrate of silver is to be preferred in all cases. When argyrol or protorgal are used the solution must be absolutely fresh.)"

The state law requires the attending physician, midwife, nurse or other person in attendance on a confinement case, to report all cases of ophthalmia neonatorum to the local health officer as soon as discovered. In addition each physician, midwife or other person in charge of the case is required to use a prophylactic for the prevention of this serious affliction.

At the 1913 session of the legislature Chapter 344 was enacted which provides an appropriation to the State Board of Health of $1500.00 per year for the purchase and distribution of a one per cent solution of silver nitrate. Special arrangements have been made with the Schieffelin Co. of New York to furnish the silver nitrate in small wax ampules at the rate of one and three-fourths cents per ampule. This material is distributed by the board free of charge, to all physicians, midwives and nurses of

the state. To June 30, 1914 approximately 70,000 ampules were distributed as a part of the initial supply which is constantly kept in stock at the central office of the State Board of Health.

WATER SUPPLIES AND SEWERAGE SYSTEMS.

Acting under the authority granted by Chapter 433, laws of 1905, the plans and specifications for water supplies and sewerage systems in the following municipalities were approved by the State Board of Health. This report covers the period from July 1, 1912 to June 30, 1914.

ARGYLE. WATER SUPPLY SYSTEM.

The plans for a public water supply system for the village of Argyle were approved on April 17, 1914. Before the plans for this system were approved an investigation was made to determine the distance of the proposed well from the river. This was found to be twenty feet. It was also found to the satisfaction of the board that the well would not be flooded from the river during high water. The well is drilled to a depth of 286 feet through solid rock. There is no communication whatever between the well or the reservoir and the river so that it will be impossible at any time to pump river water through the system.

The plans submitted, therefore, were approved and the board granted the municipality permission for the construction and operation of a public water supply system for the village.

BOSCOBEL. WATER SUPPLY SYSTEM.

The plans for the public water supply system for the city of Boscobel were approved by the board on June 2, 1913. The supply is obtained from one twelve inch well, drilled to a depth of 700 feet. The well is cased with twelve inch casing to a depth of 120 feet. Ample provision is made for protecting the well from any surface pollution.

The plans were approved as presented.

COLFAX. WATER SUPPLY SYSTEM.

The plans and specifications for this system were approved on March 28, 1914. Provision is made in the plans for casing the well to a point from seventy to eighty feet below the surface so as to prevent any surface contamination. Provision is also made for the use of a fifteen foot well-screen to be fastened at the end of the intake pipe. The screen is not to be fastened to the cas-

ing so that it can be easily replaced. The connection between the end of the screen and the intake pipe is a screw connection fastened on a circular flange.

The plans were approved as submitted.

FOX LAKE. WATER SUPPLY SYSTEM.

The proposed plans for a water supply system for the village of Fox Lake were approved by the board on September 13, 1912. The water is to be obtained from a deep well, drilled through white sandstone. No public sewer system has been provided for and the use of the ordinary type of privy and cesspool is permitted. The plans provide that the two wells will be piped the entire distance from the surface of the ground to the water supply in the sandstone formation. From the wells the water will be pumped into an elevated steel tank of 50,000 gallons capacity.

The plans as presented were approved after a thorough investigation had been made to determine the purity of the water and the precautions taken to prevent future contamination.

LA CROSSE. WATER SUPPLY SYSTEM.

The proposed plans for a water supply system for the city of La Crosse, as presented by the engineers, were approved on November 27, 1912. A complete set of the plans with a full description is now a matter of record in the office of the State Board of Health and are open to inspection at any time by persons interested. The only detailed reference to the plans made in this report will be with reference to changes required before the plans were approved.

When the first set of plans for this water system were presented they were carefully examined by the consulting sanitary engineer, W. G. Kirchoffer. Mr. Kirchoffer also made a personal investigation of the proposed site and as a result of these investigations the following alterations in the original plans were recommended by the State Board of Health.

1. The proposed plans for the wells must be modified so as to place the wells farther north and east of the present site.
2. All suction pipes leading from the wells to the pumping station should have flanged joints with gaskets in place of the lead joints.
3. The suction pipes must also be laid approximately six feet deep and must be properly supported to prevent sagging.
4. The well openings must be protected by mason work or earth dikes to prevent the admission of surface water.
5. The wrought iron pipes in the wells must be extended to a depth of 100 feet or until the stratum of coarse gravel is encountered.

6. The water should be taken through suitable screens below the gravel level, which is approximately 100 feet from the surface.

7. Where manholes are provided over the wells they shall be either sealed or made water-tight to extend above the high water mark.

8. The proposed open surface reservoir will not be permitted and the board also recommends that the concrete construction be properly reenforced to prevent cracking. Unless this is done there will be danger of surface water entering the reservoir. The board also recommended that the reservoir be properly protected with fences or other barriers.

The revised plans, which were later submitted to this department for approval, provided for the elimination of all the objections above enumerated with the exception of the filling in around the wellheads with cement. The plans were approved so as to provide that this filling may be made with sand under the following conditions:

1. That the engineers in charge of the construction work give to the city of La Crosse and to the State Board of Health assurance that the wellheads will be made tight so as to prevent any surface water from entering the well chamber.

2. That the flange cap at the head of the wells must be made absolutely tight or the extension of the pipes must be above high-water mark.

3. That the filling in with sand around the wellheads must not be less than seven feet in radius or fourteen feet in circumference of each well.

4. That the State Board of Health reserves the right to require the construction of cement manholes around each well if it becomes evident that the water is polluted from surface contamination.

MUKWONAGO. WATER SUPPLY SYSTEM.

The plans for a public water supply system for Mukwonago were approved on May 7, 1914. The water supply for this system is obtained from an eight inch driven well, 575 feet deep. In a twenty-four hour test this well showed a capacity of 150,000 gallons of water. This supply has been examined and found to be safe for domestic use.

PALMYRA. WATER SUPPLY SYSTEM.

The plans for a public water supply system for the village of Palmyra were approved on March 31, 1914. The water for this system is obtained from a ten inch drilled well 178 feet deep. The well is piped from the surface to the solid rock and will thus effectively prevent any surface contamination. After pumping for twelve hours at the rate of 300 gallons per minute, there did not appear to be any diminution in the supply. As a result of

the ample supply obtained at this well the local authorities decided to adopt a compressed air system for pumping the water.

PRAIRIE DU SAC. WATER SUPPLY SYSTEM.

The plans for the public water supply system for the village of Prairie du Sac were approved on June 2, 1913. The water supply is obtained from a well twelve feet in diameter and approximately twenty feet deep. It is located one hundred feet from the river. The well opening is properly protected from surface contamination and on account of the character of the soil between the well and the river, it is believed that there will be practically no danger of contaminating the water supply from this source. The examination of the water supply from this well made in the laboratory shows the water to be entirely satisfactory for domestic use.

WAUZEKA. WATER SUPPLY SYSTEM.

The plans for this public water supply for the village of Wauzeka were approved on June 22, 1913. The water is obtained from two wells eight inches in diameter. One of the wells is 325 feet deep and the other 290 feet deep. These are flowing wells the water rising approximately sixteen feet above the surface of the ground.

ALBANY. WATER SUPPLY SYSTEM.

The plans for this public water supply system were approved on June 9, 1914. The supply is obtained from an eight inch well about 400 feet deep. The well is cased to a depth of 180 feet. It is also found from an investigation that ample precaution has been taken to prevent any surface contamination and the laboratory examinations showed that the water is satisfactory for domestic use.

NEW LONDON. WATER SUPPLY SYSTEM.

This supply is obtained from ten different wells. Five of the wells are seventy-two feet deep and the other five wells are each approximately 170 feet deep. The wells are drilled in a sand and gravel formation. These wells flow from nine to ten feet above the surface. All of the wells are piped underground to a 200,000 gallon reservoir from which water is delivered through the entire system.

BANGOR. SEWERAGE SYSTEM.

The plans for a combined storm and sanitary sewerage system for the village of Bangor were approved on December 18, 1912.

The sewer system, as proposed, is a combination system, tak-

ing care of both sewerage and storm water, and will not permit the sewage to pass into the river except in a very diluted condition. The river is 1,780 feet from the main trunk end. A twenty-four inch sewer is provided for carrying the sewage into the La Crosse river at a point about one-half mile from the main portion of the village. The minimum flow of the La Crosse river at this point is 15,000 gallons per minute, and its velocity is about four miles per hour. There are no cities or villages on the stream with the exception of West Salem, which is ten miles by river from Bangor. West Salem is about two miles from the river. The river flows into the Mississippi river and there are no people residing near it at any point, as it runs through the lowlands, or the "La Crosse river bottoms", as the run of the land is commonly called.

It has been the policy of this board to invariably prohibit the installation of a sewerage system emptying into the rivers or lakes of this state without first treating the sewage in some efficient manner to lessen the danger of polluting the streams and thereby creating a public nuisance or other condition detrimental to health. It is practically impossible to establish any efficient method for treating the sewerage in a combination sewer of this type. Furthermore, it appears that the La Crosse river is a considerable distance from Bangor and that the cities below are not using the river as a water supply, or to any considerable degree for pleasure purposes.

In view of this situation the State Board of Health granted the village of Bangor permission to establish this sewer system and to dispose of the sewage in the manner outlined in the plans furnished. The State Board of Health, however, reserves the right to order the installation of a septic tank or other approved method by which the sewage can be treated so as to avoid any serious pollution of this stream when in its judgment such order is rendered necessary.

BOSCOBEL. SEWERAGE SYSTEM.

The plans for this system were approved by the board on June 2, 1913. One tank is provided for the purification process. This tank is forty-two feet long, fourteen feet wide and ten feet deep. It is a one-compartment tank equipped with gravity sludge pipes to facilitate cleaning. The effluent in accordance with the plans is discharged into a small ditch, which in turn empties into a creek near the disposal tank.

CORNELL. SEWERAGE SYSTEM.

The plans for a combined storm and sanitary sewer system for the village of Cornell were approved conditionally as a storm water system with permission to use this system for the disposal of sanitary sewage until such time as it may be necessary to purify the sewage in order to prevent the creation of a nuisance or the dangerous and unnecessary pollution of the stream into which the system discharges.

The board does not recommend the installation of such combined systems for the reason that it is impossible to purify this sewage when storm water in any considerable quantity is discharged into the treatment tank.

ELKHORN. SEWERAGE SYSTEM.

The plans for a sanitary sewerage system for Elkhorn were approved on June 2, 1913. An Imhoff tank is provided through which all sewage must pass. The effluent from the tank is then discharged into two sand filters. This system, if properly operated, should give satisfactory results.

FT. ATKINSON. SEWERAGE SYSTEM.

The plans for a public sewer system in the second sewer district of the city of Ft. Atkinson were approved on April 7, 1914.

This sewer district was established and the improvements made for the purpose of eliminating about eight old sewers which discharged directly into the Rock river at as many different points along the shore line. Most of these sewers were originally laid by private parties. The plans provide for the construction of a main outlet sewer which will connect up with all of these old sewers and discharge at a common point where a purification plant can be constructed when necessary.

The plans, as submitted, were approved on the condition that the board may at any time order the installation of a purification plant when necessity arises.

FOND DU LAC. SEWERAGE SYSTEM.

The proposed plans for a complete modification of the present sewerage system for the city of Fond du Lac were approved by the board on September 11, 1912.

On account of the roof water discharging directly into the sanitary sewers, it was necessary in providing for a purification plant to install one large pump which can be utilized in discharging the sewage without treatment into the Fond du Lac river. This will only be done, however, at the time of heavy

rains or when the sewage is sufficiently diluted so as to eliminate the dangers incident to the discharge of raw sewage into the river. The board strongly recommended in this case that the discharge of roof water into the sanitary sewer be discontinued as soon as possible. The plans were approved under the following conditions:

1. The State Board of Health reserves the right, if necessity demands, to require the installation of a trickling or filter bed for the further purification of the sewage.

2. The plans were approved on the condition that the city of Fond du Lac employ a competent chemist to assist in bringing the efficiency of the disposal plant to its highest standard.

3. The board requires that the city must employ some capable person to attend to the working of the plant at all times. This is for the purpose of insuring the use of the hypochlorite of lime in purifying the effluent.

4. The board required that the plant shall be so installed that a trickling or sand filter can be added at any time without any material change in the existing plans.

5. That the greatest care shall be exercised at all times in disposing of the sludge from the sludge pits.

6. That the effluent shall be treated with hypochlorite of lime at all times except when the large pump is used for the purpose previously explained.

(See special report in Laboratory Section).

GRAFTON. SEWERAGE SYSTEM.

The revised plans for a public sewerage system for the village of Grafton were approved on December 23, 1913. The original plans provided for a combined storm water and sanitary sewerage system. In order to eliminate, as much as possible, the discharge of storm water into the septic tank two twenty-four inch overflow pipes are provided which will discharge directly into the Milwaukee river. In order to overcome this objection the board suggested that the plans be revised so as to provide separate pipes for carrying the storm water and the sanitary sewage.

We advised that this could be done without additional expense for the reason that the size of the pipes could be greatly reduced and the storm sewers could be laid above the sanitary sewers in the same trench. In this way all storm water will be kept out of the septic tank and it will not be necessary to construct a tank as large as was originally proposed. The board also required that the original plan for the construction of the septic tank be altered so as to make some provision for the cleaning of the tank.

The revised plans were approved under the following conditions:

1. That a manhole be placed at a point where the main sewer divides and that a sluice gate be installed instead of the gate valves as shown on the plans. This is for the purpose of facilitating the cleaning out and repairing of either one of the branches of the main sewer.

2. It appeared from the plans that the effluent will discharge on the surface of the ground. The board, therefore, required that provision be made for extending a pipe from the tank to the river through which all of the effluent must pass.

JACKSON. SEWERAGE SYSTEM.

The revised plans for a public sewer system for the village of Jackson were approved on April 18, 1914. Provision is made in these plans for the construction and operation of two septic tanks, one located east of the village and the other near the western limits. This virtually constitutes two separate systems, but on account of the topography of the country, it was deemed advisable to install the system in this manner.

MENOMONIE. SEWERAGE SYSTEM.

The combined storm and sanitary sewerage system for the second sewer district of the city of Menomonie were approved on March 31, 1914. The plans were approved as a storm water system with the privilege of using this system for the disposal of household waste until a sanitary sewer is installed or until such time as it may be necessary to purify the sewage in a more complete manner than can be done where a combined system is used.

These plans were approved under these conditions for the reason that it appeared from a personal investigation that the greatest need of this district, at the present time, is for storm water sewers. Not more than fifteen homes will connect with the sewerage system for several years.

OCONOMOWOC. SEWERAGE SYSTEM.

The plans for a sewage purification plant were approved on February 24, 1913. The plans, as approved, provide that the city sewage shall be collected in an old pump well which is now used as a sedimentation basin. From this well the effluent flows through a large reservoir excavated in a gravel formation found in this locality. The effluent from the reservoir is discharged

through the gravel bed and any surplus passes over the small weir at the outlet end of the reservoir. About twice each month the deposits are pumped into the old septic tank used for the purpose of collecting this material. Any liquids which are pumped into the tank with the solid material are discharged on the old filter beds. The effluent from the filter beds are disposed of in the river.

PRAIRIE DU CHIEN. SEWERAGE SYSTEM.

The plans for this system were approved on June 2, 1913 under the following conditions:

That the outlet be extended at least 1100 feet so as to reach the channel of the Mississippi river in order to prevent the accumulation of decomposed sewage material in the stagnant arm of the slough.

Permission was granted the municipality to make this extension at any time within one year so that the work could be done at a time when the water in the river is at a low stage.

PARK FALLS. SEWERAGE SYSTEM.

The plans for the proposed sewerage system for Park Falls were approved on July 23, 1913. A purification tank is provided through which all sewage must pass.

The plans were approved as presented.

SHEBOYGAN FALLS. SEWERAGE SYSTEM.

The plans and specifications for a sewerage system for the village of Sheboygan Falls were approved on September 21, 1913. The system is constructed to take care of approximately 170,000 gallons of sewage per day all of which is treated in a septic tank and the effluent is discharged into the Sheboygan river. The sludge is disposed of by being distributed over an adjacent tract of land which is preserved for that purpose.

WEST BEND. SEWERAGE SYSTEM.

The plans for the extension of the sewerage system for West Bend were approved on May 28, 1913. Provision is made for taking care of approximately 10,000 gallons of sewage per day. Purification tanks are provided for.

WAUPUN. SEWERAGE SYSTEM.

The plans for this system were approved on July 29, 1913. The purification system provided for at Waupun is the Imhoff tank method. The system is designed for the installation of a filtration system if necessary.

WABENO. SEWERAGE SYSTEM.

The plans and specifications for the proposed sewerage system for District No. 1 of the city of Wabeno were approved on September 30, 1913.

The plans were approved with the following changes:

1. The septic tank shall be so located and constructed that if necessary to use filtration beds this can be done without materially changing the present system.

WEST MILWAUKEE. SEWERAGE SYSTEM.

The plans provide for an extension of the present sewerage system and were approved on May 7, 1914.

The plans were approved as presented.

MILWAUKEE HOUSE OF CORRECTION. SEWERAGE SYSTEM.

The plans for this system were approved on May 13, 1914. Provision is made in these plans for collecting all sewage from the institution in a septic tank especially designed for that purpose.

The plans were approved as presented.

A SANITARY SURVEY OF LAKE MICHIGAN ALONG THE WISCONSIN SHORE.

By E. J. TULLY, Chemist, State Laboratory of Hygiene, Laboratory of the State Board of Health.

(Reprint of the Cleveland Medical Journal, Vol. XI, page 809)

There is probably no better municipal supply in this country than that furnished by Lake Michigan, if drawn at such a location that it is free from sewage pollution. The Lake was originally a body of pure water, but with the development of industrial and commercial life along its shores the time came when the increased industrial and household waste had to be gotten out of the way and it was natural enough that the large body of water near at hand, apparently capable of receiving and rendering innocuous any amount of sewage, should serve as the disposal ground.

Accompanying the growth of the cities came the demand for and the necessity of a sufficient supply of pure water. The ground and surface waters could no longer be depended on to ensure an adequate and suitable supply of water, consequently the people turned to the Lake for water, and now for a number of years they have been discharging sewage into Lake Michigan through one pipe and pumping out a water supply through another. The Lake near the shore, however, is not only polluted by the discharge of city sewage, but by other sources as well, such as the discharge of harbor water, the discharges from creeks, the shore wash and stirring up of the bottom of the Lake by winds and currents, dumping of dredging material and accidental pollution by steam boats, sailing vessels, and other shipping.

The municipal authorities, awake to the danger of using the polluted shore water as a source of supply, deemed it possible

to secure a reasonably safe water by extending the intake to one-half mile or so from shore and locating the sewage discharge pipe to the south of the water intake pipe, hoping in this manner to divert the sewage from the source of drinking water; but as the outlet of the Lake is comparatively small, relatively to the quantity of water it contains, there is no direct flow and the movements of the water are almost entirely dependent on local winds, which greatly overbalance the general movements of translation and drive the waters one way or the other according to their direction, velocity and duration. The atmospheric temperature also influences these movements, and near the mouth of large streams these, too, have this effect. The results of our survey conclusively show that no definite currents exist which can be relied upon to protect a water works intake from adjacent sewage pollution and so-called drift, caused by unbalanced movements of the wind; hence it is assuredly unsafe to assume that the discharge of sewage into the Lake in a particular direction furnishes a means of protection for a water supply. That such reasoning is erroneous is amply attested to by the typhoid fever and other intestinal troubles that have appeared in certain cities along the lake front with more or less frequency.

Our purpose in making the survey of Lake Michigan along the Wisconsin shore was to find whether the water is safe to drink without filtration, and also to determine the extent of pollution of the water along the shore; also to ascertain the general quality of the water over a considerable period of time and under a variety of conditions, desiring in this manner to determine the extent to which the Lake could be relied on to furnish a safe supply.

The study of the water was first undertaken in the summer of 1909 and has been going on at the State Hygienic Laboratory under the general direction of Doctor M. P. Ravenel, Director of the Laboratory, for the last three summers. The work has been done, in a general way, in conjunction with the Lake Michigan Water Commission and the methods of procedure have been in general, the same as those used by the states of Michigan, Indiana and Illinois.

Surveys have been made at Kenosha, Racine, Milwaukee, Sheboygan and Manitowoc, and it is our desire and expectation to complete the work by making studies at some of the larger cities north of Manitowoc next year. At each city where exam-

inations have been carried on an inspection of the water works and sewage disposal system was made, together with an investigation of any other possible sources of pollution along the shore.

At each city a series of seventy-two samples were collected, the collection lasting over a period of six weeks. Samples were collected at the intake and at points one mile apart up to seven miles from shore in a direction at right angles to the shore line. Collections were made every other day, when four samples were taken; the intake samples came from a depth of thirty-five to forty feet, all others were collected at the uniform depth of ten feet from the surface. Either a tug or a gasoline launch was hired for the collection of the samples, the work of collection being in charge of the local health officer. In a few cases stations were marked by buoys, in others it was decided to run the tug or launch on definite ranges by the compass, using a fixed landmark on shore, and the distance traveled was estimated by the time at full speed. This method was found to be fairly accurate.

The samples were collected in two and one-half liter bottles, and the bottles were well iced before shipment. In all cases care was taken to have the cases delivered to the State Hygienic Laboratory within twenty-four hours from the time of collection. Data regarding the direction of the wind and current, condition of the sea, and weather conditions were taken with each series of samples.

The following chemical and bacteriological tests were made on all samples: Color, odor, turbidity, free ammonia, albuminoid ammonia, nitrites, nitrates, chlorin, oxygen consumed, alkalinity, total bacterial counts on gelatin and on agar, acid colony count, and presumptive and confirmatives tests for *B. coli.* Instead of the usual procedure of inoculating the dextrose fermentation tubes with 0.1 ccm, 1 ccm and 10 ccm respectively, quantitative determinations were made, that is, instead of one tube each for 0.1 ccm, 1 ccm and 10 ccm three tubes with 1 ccm, three with 10 ccm and one with 0.1 ccm were inoculated. In this manner, it is believed, a more precise value of the quality of the water was obtained. In general, the standard methods of the American Public Health Association were followed.

We have considered the physical appearance of the water, because in connection with a water supply the amount of sediment in the water is of great importance. Modern standards require that a drinking water should be reasonably clear, at all

times free from color and disagreeable odor, and fairly soft. Sanitary requirements demand that a drinking supply shall at all times be free from sewage pollution.

The results of chemical analysis indicate that the water of Lake Michigan along the Wisconsin shore is moderately hard; the alkalinity, which is due to carbonates of calcium and magnesium, averages about 111. The ammonias, nitrites and oxygen consumed were usually higher in shore than out, but often high values, indicating contamination, for these determinations were obtained five, six and seven miles from shore. As a rule, the water was free from any decided odor, always free from color, and very low in turbidity. Near shore the water was usually turbid but at one-half to one mile or so from shore and at a depth of thirty-five to forty feet, where intake pipes were located, the water was usually free from decided turbidity.

The bacteriological results of the work carried on at each city show occasional relatively high gelatin and agar counts and the presence of *B. coli* in 1 ccm and 10 ccm even seven miles from shore, thus showing the effect of wind and current. Near shore, that is from one to three miles, the results indicate that the water is often polluted and that the municipal supplies are frequently more or less polluted.

SUMMARY AND CONCLUSION.

As a result of these studies the conclusion is that the water of Lake Michigan along the Wisconsin shore is not at all times a safe source of supply. The water is polluted and at times quite heavily so, even out to a distance of seven miles from shore. The chemical and bacteriological data conclusively indicate that there are no uniform currents in this portion of the Lake and that sewage once deposited in it may be carried in any direction, depending on the direction and force of the wind.

It is indeed as fallacious to assume that the discharge of sewage into the Lake in a given direction relative to the location of the intake pipe will afford the necessary protection to a water supply as it is erroneous to presume that the extension of the intake pipe to two or three miles from shore will ensure a safe supply. The sewage from any one point along the shore may be carried over the intake of any of the water supplies when the wind and current are in the proper direction, and for this reason the abatement of any one nuisance will not afford a great measure

of relief, as the remaining sources of pollution will be sufficient to render the water unsafe.

The extension of the intakes a few miles from shore will certainly not provide at all times an adequate protection against impure water, because the results definitely establish the fact that the zone of pollution extends at least seven miles from shore.

During the last few years the conservation of natural resources has been one of the chief endeavors of our scientists and engineers. Its principles should be applied to the case in hand. The character of the water of Lake Michigan is so well adapted for domestic and industrial uses that cities along its shore can not afford to pollute it and destroy it as a water supply, and in order to reëstablish its purity it is essential that the discharge of unpurified sewage and industrial waste be stopped and that all other sources of pollution be abated or mitigated as much as possible.

RECOMMENDATIONS.

As a result of these studies one of the principal questions which suggests itself is: What is the remedy for this trouble and what methods of purification should be adopted? This question can only be solved after a careful study of the costs involved. There are obviously several courses open. Either the sewage may be purified by one of the methods of filtration or a suitable combination of methods of disposal, or sterilized, before it is discharged into the Lake, or the water supplies may be filtered, or both methods of purification, sewage and water, may be established. There is also the problem of extension of the intakes, but as long as sewage is allowed to be discharged freely into the Lake, the extension of the intake is but a temporary expedient, for the pollution is always being driven out in greater amounts. In order to escape pollution and to ensure a safe supply of water it would be necessary to extend the intake to a distance of from twelve to fifteen miles from shore, but such an undertaking would be impractical. Estimates will show that it would be cheaper to adopt filtration, to say nothing of the greater safety secured.

It is possible with modern methods of sewage purification by filtration to secure an effluent which is safe to drink, but the method is relatively quite costly. Probably the most economical and efficient procedure would be filtration of the sewage, using

trickling filter beds in order to obtain organic stability and partial bacterial purification of the effluent, and subsequently to disinfect the effluent with calcium hypochlorite in order to remove pathogenic organisms. Chemical disinfection alone offers a means whereby a high bacterial purification may be accomplished without complete purification of the organic matter, but in no sense is it a substitute for sewage purification as ordinarily understood, for, though the application of hypochlorite to an effluent oxidizes the organic matter in it to some extent, and thereby increases its stability, such improvement is only incidental.

In conjunction with sewage purification, filtration of the water should be undertaken by municipalities deriving their supply from the Lake. It will only be a few years before the Lake water will have to be filtered because the necessity of and demand for filtration is constantly increasing. Filtration is easily possible at moderate cost. In this case the evidence indicates that mechanical filtration would be both efficient and economical, as the water is sufficiently hard. In connection with the matter of filtration it is very desirable to point out that it is extremely important that such a plant when built should be properly operated.

As a temporary expedient, prior to the installation of filtration plants, it would be desirable to treat the water with hypochlorite of lime, and thus ensure a safe supply for the time being. Only a small amount of hypochlorite is necessary, about four or five tenths parts per million of available chlorin will suffice to remove over 99 per cent of the total bacteria present.

Below are tabulated some results of the treatment of Lake Michigan water with different amounts of available chlorin, and also data showing the efficiency of calcium hypochlorite as a disinfectant for crude sewage and trickling filter effluents.

These results indicate clearly the efficiency of calcium hypochlorite as a disinfectant.

DISINFECTION OF LAKE MICHIGAN WATER WITH CHLORIDE OF LIME

		Gelatin count	Agar count	Gas production in (dextrose) fermentation tubes.		
				1 ccm	0.1 ccm	10 ccm
Raw water.....		4200	145	+	+	+
Treated water; time of treatment, one-half hour.....	Av. Cl. in p. p. m.					
	0.1	1800	14	—	+	+
	0.3	150	5	—	—	—
	0.5	3	2	—	—	—
	0.7	2	2	—	—	—
	1.	2	2	—	—	—
	2.	1	2	—	—	—
	3.	2	1	—	—	—

DISINFECTION OF CRUDE SEWAGE WITH CHLORIDE OF LIME.

		Gelatin count	Agar count	Gas production in (dextrose) fermentation tubes							
				0.000001 ccm	0.00001 ccm	0.0001 ccm	0.001 ccm	0.01 ccm	0.1 ccm	1.0 ccm	10.0 ccm
Raw sewage.....		1,230,000	1,000,000	+	+	+	+	+	+	+	+
Treated sewage; time of treatment, one hour	Av. Cl. in p. p. m;										
	1.	615,000	480,000	—	+	+	+	+	+	+	+
	2.	9,000	30,000	—	—	—	+	+	+	+	+
	3.	250	700	—	—	—	—	—	+	+	+
	4.	200	300	—	—	—	—	—	+	+	+
	5.	120	150	—	—	—	—	—	—	+	+
	6.	90	95	—	—	—	—	—	—	+	+
	7.	50	105	—	—	—	—	—	—	+	+
	8.	25	96	—	—	—	—	—	—	+	+
	9.	20	45	—	—	—	—	—	—	—	—
	10.	18	40	—	—	—	—	—	—	—	+

DISINFECTION OF EFFLUENT FROM TRICKLING FILTER WITH CHLORIDE OF LIME.

		Gelatin count	Agar count	Gas production in (dextrose) fermentation tubes						
				0.00001 ccm	0.0001 ccm	0.001 ccm	0.01 ccm	0.1 ccm	1.0 ccm	10 ccm
Raw Effluent		170,000	70,000	—	+	+	+	+	+	+
Treated effluent, time of treatment, one-half hour	Av. Cl in p. p. m.									
	1.	50,000	6,000	—	—	—	+	+	+	+
	2.	2,000	250	—	—	—	—	+	+	+
	3.	80	41	—	—	—	—	—	+	+
	4.	69	36	—	—	—	—	—	+	+
	5.	55	30	—	—	—	—	—	+	+
	6.	34	21	—	—	—	—	—	—	+
	7.	30	19	—	—	—	—	—	—	+
	8.	12	17	—	—	—	—	—	—	—
	9.	13	20	—	—	—	—	—	—	—
	10.	10	16	—	—	—	—	—	—	—

In conclusion, it is believed that the solution of the problem is the filtration of the Lake water and the purification of sewage before it is discharged into the Lake.

No single municipality can hope adequately to handle the situation. The problem of supplying a permanently safe water can only be solved by the concerted action of the cities along the shore, and possibly aided by the state.

REPORT OF INVESTIGATION OF WATER SYSTEM, FOND DU LAC, WISCONSIN.

By E. J. TULLY, Chemist, State Laboratory of Hygiene, Laboratory of the State Board of Health.

After making a preliminary examination of the immediate surroundings of the water works and conferring with Dean Turneaure in regard to the general conditions, I decided to take three series of samples—two before and one after rain—in order to make the determinations as quantitative as practicable under the circumstances, with the idea of discovering the source of the trouble at once; and, also, to ascertain the effect, if any, of the heavy rainfall on deep well water.

Subsequently I made an investigation of the conditions about the wells and plant in general, and also the sections adjacent to the plant. At the plant I discovered what I believe to be one source of the trouble—the reservoir. The sides of the wooden covering of the reservoir do not come flush with the top of the stone walls of the reservoir, and through this space, during rains, surface material may be washed and dust blown into the stored water; and, also, organic material from the sides and roof of the covering may find its way into the reservoir through this space. I noticed some organic material getting into the water while making an inspection during the rain.

A few blocks from and to the east of the plant are two outcroppings of limestone strata, and in the vicinity of the edge of these surface exposures the sanitary conditions are rather unsatisfactory; in one case there is a considerable accumulation of manure and refuse. During rain, washings from such material might find its way in a more or less direct manner into the well water, if fissures of some considerable extent exist in the

limestone formation; but the well water appears to be free from pollution at this time as indicated in the analyses.

The chemical and bacteriological results of the three series of examinations indicate that the individual wells are free from pollution. The conditions under which the sample from well No. 2 was taken practically vitiate the results of the test; and as well No. 5 is a new one, the water has not yet reached its normal quality, but will undoubtedly do so as the water from the new well No. 4 has already done, in a short time. The findings in these two cases are of no special significance in this particular instance.

It appears, however, that the reservoir water collected either at the reservoir, the tap at the pumping station, or the tap at 88 South Main street has been consistently more or less contaminated, indicating that some foreign matter—probably surface material and dust, rather than sewage—is gaining entrance to the system at the reservoir.

It would appear from a comparison and analysis of the results that the reservoir needs to be better protected from surface material.

REPORT OF THE SANITARY CONDITION OF THE YAHARA RIVER AND LAKE MONONA ALONG ITS WESTERN SHORE.

By E. J. TULLY, Chemist, State Laboratory of Hygiene, Laboratory of the State Board of Health.

It appears from an analysis of the data derived in this survey that the sanitary condition of the Yahara River and Lake Monona is satisfactory at the present time. The putrescibility tests and dissolved oxygen determinations, indicating, respectively, the condition of a liquid relative to subsequent putrefaction and prospective nuisance, and the potentiality of a liquid effecting self purification, show that the river and the lake along the western shore from the mouth of the Yahara River to a point near Blount street are in stable condition and well oxygenated.

The mixing of the effluent and river water takes place rapidly and is quite complete a short distance below the outfall pipe; and provided present conditions continue, relative to inflow from Lake Mendota, velocity in the river and quality of the effluent, there is but slight probability of the lower part of the river becoming putrescible and thereby creating a nuisance. If the flow from Lake Mendota were to be considerably diminished the conditions under which a nuisance might develop in the river would depend mainly on the number of days the minimum flow continued, the volume of sewage pumped and the efficiency of the settling tanks. In such a case, however, the river water would be sufficiently purified by dilution with the well oxygenated water of Lake Monona.

The water and sludge of the swamp located southwest of Stondall's residence is highly putrescible, at least during the warm weather, and requires about six to ten times as much Lake Men-

dota water to effect stability as is necessary to completely oxidize raw sewage. Most of the mephitic and noxious odors noticed in the vicinity of Patterson street during warm weather very probably emanate from this swampy tract of land.

The western shore of Lake Monona from the mouth of the Yahara river to Blount street was quite free from any sign of sewage contamination. The brownish green scum frequently noticed on the surface of the lake—and often mistaken for sewage—is composed mainly of plant life—algae. The septic liquid discharged from the Blount street sewer rapidly becomes oxidized as it passes into the lake, and is rendered entirely stabile and free from odor within a few yards of the sewer.

The bacteriological data indicate that the lake along the western shore is only moderately contaminated—about to the same extent as most surface waters; the quality compares very favorably with the quality of the water of Lake Mendota in the vicinity of the bathing beach near the university gymnasium.

The experiments made on the effluent for putrescibility showed that the dilution necessary to effect stability varied somewhat. The maxium dilution found to be necessary (4 days basis) was 1:40. The average volume of effluent discharged into the river is estimated to be 3,000,000 gallons per day. The amount of Lake Mendota water, therefore, necessary to render this volume of effluent innocuous and stable would be 120,000,000 gallons per day. It would be advisable, however, to have an inflow of 180,000,000 gallons per day in order to take care of fluctuations in the volume and concentration of the effluent.

REPORT OF EXAMINATION OF SAMPLES OF LAKE MONONA WATER.

By E. J. TULLY, Chemist, State Laboratory of Hygiene, Laboratory of the State Board of Health.

From examination of samples of Lake Monona water, it appears that the northern part of the lake is more polluted than the southwestern section in the vicinity of Brittingham Park—the degree of pollution at the northern end decreases rapidly with increasing distance southeast of the outfall; the lake southwest of the bathhouse in Brittingham Park is practically free from pollution. In the vicinity of what may be termed the Bassett street sewer, however, the water is moderately polluted; but as the discharge from this sewer has been shut off, the quality of the water in the immediate vicinity will rapidly improve and soon be restored to its normal quality. The water at the bathing beach is only slightly polluted at this time; it is satisfactory for bathing purposes.

It has been stated that the effluent from the septic tank at the bathhouse in Brittingham Park is discharged into the lake without any subsequent treatment. This effluent adds quite a little to the pollution of the water in the immediate vicinity of the bathhouse, and, as it is potentially dangerous, it should be treated with a disinfectant, such as chloride of lime, before discharging it into the water at the bathing beach.

The only decided odor along the water front was in the vicinity of the sewage outfall near the mouth of the Yahara River. There will always be more or less odor in this neighborhood, particularly during the warm weather, as long as the practice of discharging the sewage effluent at the surface of the water is continued.

The disagreeable odor so often complained of in this vicinity

may be entirely eliminated—in so far as it is due to the sewage effluent—and the general appearance of the water much improved, too, by discharging the effluent under the surface of the water in Lake Monona.

To obtain the best results the effluent discharge pipe should be extended into the lake along the bottom, about 150 feet from shore, and the effluent discharged at such a point that complete intermingling of the effluent with the current from the Yahara River will be effected and the possibility of stagnation of the organic matter prevented.

Such a procedure as this would ensure a greater immediate dilution of the septic effluent than obtains at the present time with the discharge taking place at the surface of the Yahara River; the putrescible and odorous compounds would at once be oxidized and dissipated, and the physical nuisance due to foul odors would be eliminated.

REPORT OF THE INVESTIGATION OF THE WATER SUPPLY OF MERRILL, WISCONSIN.

By E. J. TULLY, Chemist, State Laboratory of Hygiene, Laboratory of the State Board of Health.

The analytical data afford ample conclusive evidence of the pollution, moderate in extent, of the Prairie River all along its course; the degree of pollution, of course, varies somewhat; it is always present, however, and to about the same extent a mile or so above the dam as it is in the vicinity of the water works intake pipe.

The pollution is mainly of an animal nature and is derived directly, and indirectly through the agency of surface washings. There is, however, one source of human contamination below the dam, namely, bathing. Because of the potentiality by this means of seriously polluting the water within a quarter of a mile or so of the intake, bathing should be at once prohibited, and the prohibition should be strictly enforced. Bathing should be done not above the intake, as has been the practice, but below it.

The effluent from the paper mills, discharged into the river below the dam, is not supposed to carry any sewage—only industrial waste is intended to be discharged through the river outlet pipe. It is a source of contamination, however, and the character of it should be closely watched.

As the quality of the river water is practically the same above and below the dam, the extension of the intake pipe to some suitable point in the river at a considerable distance above the dam with the hope of obtaining a much more wholesome river water than is obtained at the present intake would be as uneconomical as it would be futile. There is no decided sanitary advantage to be gained by and no material justification for such an extension.

A river water of decidedly better quality than that near the present water works intake may only be found miles above the dam, and, of course, extension of the intake pipe to such comparatively remote points is not to be considered as necessary.

A potable public water supply of good quality should be sought for along the lines of increased efficiency in filtration rather than by the means of intake extension. Efficiency of the purification system is the essential requisite leading to the production of an acceptable supply.

The investigation of the efficiency of the plant indicates that in general the operations are effectively conducted. The company is concerned to effect thorough treatment and to deliver pure and wholesome water; and it appears that in general the quality of the filtering water is satisfactory, although the color reduction accomplished is not all that could be desired.

There is evidence, however, of irregularity in the operation of the system. Some of the data are of such a convincing nature as to lead to the conclusion that at times the water is imperfectly purified, and can not be regarded as acceptable. An entirely satisfactory bacterial purification and color removal may always be accomplished by proper treatment, yet, occasionally, effluents are discharged which are unsatisfactory as to color and bacterial content.

The possibility of danger lies in this irregularity of operation which results in the delivery of water of fluctuating composition. As the pollution of the river water varies a good deal from time to time—it is contaminated to a higher degree in the spring and summer than in the winter—the necessity for uniformity of treatment is indicated; it is a fact that diseases other than typhoid may be affected by polluted waters, hence the necessity of efficiently purifying the river water, and maintaining a high standard of treatment at all times.

In the management of the plant an amount of coagulant should always be added sufficient to remove practically all color from the river water—the color of the effluent should be maintained below 10 parts per million; and no effluent should be passed into the filtered water reservoir after a filter has been washed until its color index is below 10. The color index may be taken as a superficial measure of the efficiency of treatment.

REPORT ON USE OF HYPOCHLORITE IN THE TREATMENT OF SEWAGE AT FOND DU LAC, WISCONSIN.

By E. J. TULLY, Chemist, State Laboratory of Hygiene, Laboratory of the State Board of Health.

In view of the fact that the experimental work in connection with the installation of the hypochlorite process at Fond du Lac is about completed, and that practical treatment of the sewage effluent is now under way, it seems desirable at this time to submit a preliminary report of the investigation in the form of a synopsis.

When the work was undertaken considerable difficulty was encountered at the very commencement with the hypochlorite delivery apparatus. It was soon discerned that the delivery apparatus, which was intended to be used with only one sewage pump, would not functionate at all properly and accurately under the influence of three pumps, which now, under the existing pumping conditions, may be automatically thrown into service whenever the demand necessitates their action. As I understand it, the additional pumps were added to the system after specifications for the hypochlorite process had been drawn up.

As a result of this condition of affairs it was necessary to design and install a new arm for the delivery device, and adjust it so that the orifice would deliver approximately the required amount of hypochlorite solution. Of course, this delivery device can not be regulated so as to discharge proportionate amounts of hypochlorite over the entire range of flow of the sewage effluent over the weir; the most that may be hoped for with the present arrangement is to secure the proper addition of the disinfectant over the normal range of flow. Accordingly, with this aim in

view, the device was adjusted so that the desired treatment would be effected with the average daily flow of effluent.

More than one hundred examinations and tests were made at the laboratory in the plant at Fond du Lac, and as a result of these laboratory examinations it appears that 7 parts per million of available chlorine will accomplish practical disinfection. This amount of available chlorine effects a bacterial reduction of about 99 per cent.

As the river water into which the treated effluent is discharged is highly polluted, as shown in the table, it seems quite probable that an amount of available chlorine less than 7 parts per million will, under working conditions, accomplish a degree of disinfection which will be satisfactory in view of the existng local conditions.

The average daily flow of effluent, according to the statement of the City Engineer, is about 1,000,000 gallons, but the daily flow fluctuates from the minimum volume of about 700,000 gallons to a maximum volume of approximately 5,000,000 gallons during periods of heavy rains. The average daily flow of 1,000,000 gallons, would require, using 7 parts per million of available chlorine, about 174 pounds of calcium hypochlorite.

The percentage of available chlorine in the bleach is about 38, indicating that the city obtained a very good grade of chloride of lime. I believe that the cost per pound of bleach is about $0.02, so that the cost of disinfecting 1,000,000 gallons per day, treating the effluent with 7 parts per million of available chlorine, is about $3.48.

There is no necessity for disinfecting the effluent to such an extent that the bacterial content per cc. will be very much less than that of the normal river water into which the treated effluent is discharged; the river water usually contains several hundred thousand organisms per cc., while 7 parts per million of available chlorine reduces the bacterial content per cc. of the effluent to probably about 10,000. Hence, it seems probable that a smaller amount of available chlorine than 7 parts per million will accomplish, under practical working conditions, an acceptable bacterial purification, and, therefore, the cost of treatment will be proportionately decreased.

This method of chemical disinfection offers a means whereby a reasonable degree of bacterial purification may be accomplished without complete purification of the organic matter. It should

be borne in mind, however, that chemical disinfection is in no sense a substitute for sewage purification as ordinarily understood, for, though the application of chlorine to an effluent oxidizes the organic matter in it to some extent and thereby increases its stability, such improvement is only incidental. It is not in any way comparable with the cost of treatment—filtration—and it would be unwise to attempt to obtain stability in such a manner. Incidentally, however, the advantages of this increased stability are obtained.

In this instance the treated effluent is diluted quite well; the dilution factor is sufficiently high at the present time to preclude the danger of physical nuisance. However, further treatment, filtration, will be necessary, not only when the discharged effluent produces or threatens to produce a physical nuisance, but whenever the self-purifying power of the stream into which the treated effluent is discharged is appreciably drawn upon.

The present sanitary standard demands stability in all affluents unless the dilution is very great, not only in relation to the local discharge but also in relation to all effluents which the body of water in question may receive. This much is demanded from the standpoint of physical pollution alone. If, therefore, bacterial removal is desirable or essential, disinfection is particularly satisfactory as a finishing process, because it can now be conducted at far less cost than the cheapest form of supplementary sand filtration.

REPORT OF INVESTIGATION OF THE SANITARY CONDITION OF THE SECOND WARD CREEK, COLUMBUS, WIS.

By E. J. TULLY, Chemist, State Laboratory of Hygiene, Laboratory of the State Board of Health.

The creek which is the source of complaint is located in the second ward of the city of Columbus and flows in a north easterly direction; and the confluence of the Crawfish river and the creek takes place at what is commonly known as the mill pond. From this point the waters flow east over the dam at the "Columbus Mills." A glance at the topographical map shows that the land slopes very gradually toward the creek, allowing surface washings to pass into the stream very readily. Its banks are surrounded by vegetation, and in one place the creek flows through a small marsh or swamp covered with vegetation; and in another location, not far above the mill pond, a moderate dump has been established on its eastern bank.

The length of the creek from the mill pond to the point where the effluent from Kurth's Brewery discharges into the stream is about one mile. The width varies considerably; near the pond the width is about ten feet; above James street the creek expands somewhat, but beyond this point the width decreases with increasing distance from the mill pond, until in the vicinity of the Kurth plant the creek has been reduced to a stream only a few feet wide. The depth of the creek also varies considerably—from a depth of six inches at what may be termed the upper part (at Kurth's Brewery) of the creek, to a depth of several feet near James street.

The locality through which the creek flows is agricultural at its upper part and residential at its lower part, from School

street to the mill pond. The assessed value of the property abutting the creek is about $173,000 and is a consideration of importance in this problem.

The creek has been gradually filling up with deposits derived from surface washings, industrial wastes from the Kurth establishment, and vegetation from the banks of the creek itself. The plant life along the banks is rather luxuriant and furnishes a very considerable quantity of organic matter to the water; the growths either succumb to natural causes or are killed off by the toxic action of the foul water of the stream and subside to the bottom of the creek, there to decay, because of the lack of oxygen in the stream, and give rise to disagreeable gases and mephitic odors during the warm weather. To this vegetable organic matter which has passed and is constantly passing into the stream may be attributed one of the important causes of the present insanitary condition of the entire creek.

Owing to the constant head or height of the water in the mill pond which is maintained by the dam at "Columbus Mills," the current of the creek in this vicinity has been reduced to a minimum. The movement of the water in the lower end of the creek is very slow; at the upper extremity of the stream the current is fairly swift, and the velocity is such as to enable it to carry a rather high percentage of suspended matter. When this relatively rapid flowing water reaches the comparatively stagnant water of the lower end of the creek, the velocity is gradually reduced with the concomitant subsidence of all but the very finest suspended matter. It is because of the more complete and extensive precipitation of this suspended organic matter in the vicinity of James street that the nuisance, which is progressive, is more extensive along the lower part of the stream between the mill pond and School street than it is above this section.

Before undertaking the analytical work a careful inspection of the conditions was made; and especial attention was paid to the character of the effluents entering the creek as well as to the general condition of the stream itself.

It was at once apparent that the complaints made about the foulness of the creek water were well founded. The appearance of the water was objectionable and the odors emanating therefrom were decidely offensive. To the superficial observer, at times during the warm weather, the creek, or possibly only portions of it, may not manifestly be in a condition to be regarded

as a nuisance. As a matter of fact, however, proved by the analytical results, the entire stream during the warm weather is in an unstable state, and if it is not actually in a complete putrescible state, emitting noxious odors and unsightly in appearance, it is potentially capable of becoming actively septic at any time when the proper combination of required conditions as to time and temperature obtain.

At times the surface of the water, in the lower portion of the creek especially, is covered with scum. Gases may be constantly seen bubbling up through the water and scum. On one day during the investigation there was practically a solid mass of scum extending over the water of the creek from the mill pond to the "rushes." The odor of decaying organic matter was always noticeable about the lower end of the creek, and usually it was decidedly strong and disagreeable. At times, particularly after several days of warm weather, the stench is exceedingly obnoxious; and it has been stated at times the odor in the vicinity of James street is about as much as a person can endure. On certain days the offensive odors not only exist in the immediate locality, but they permeate the atmosphere for several blocks, and different sections, according to the direction of the wind, are seriously affected.

The foul odors which more or less constantly emanate from the creek during the summer months must have a depressing effect upon the health of persons living in the immediate vicinity; and the value of property in this neighborhood is also detrimentally affected because of the existing objectionable condition of the stream.

The water throughout the creek is decidedly turbid. One factor which makes for high turbidity is the "scum". This material consists mostly of organic matter released from the bottom of the creek by the gases of putrefaction; as the gases ascend from the bed of the stream, portions of this material are distributed throughout the water in the immediate vicinity of the gaseous evolutions, and some of the substance is carried to the surface and forms a scum, some of which subsequently disintegrates, and again subsides to the bed of the creek. The color of the creek water is usually dark; the color of the stream becomes darker as the water flows towards James street, at which point the water is always decidedly colored.

It is not known that any domestic sewage is discharged into

the creek; and probably only a few storm sewers empty into it. The only effluent of importance passing into the stream is the industrial waste discharged from the Kurth plant, which consists of the previously mentioned barley washings and grain room washings. The color of the barley washings—four washings are usually made I believe—varies in intensity from the deep yellow and slightly turbid first washings to the practically colorless and clear fourth washing. All of these washings are decidedly unstable, and particularly the first cleaning, which takes up oxygen with remarkable avidity. The grain room washings are milky white and opalescent, due to the large amount of suspended starchy material which they carry; these washings, also, are decidedly unstable.

The reason these washings do not putrefy is because of the low temperature of the wash water. The temperature varies from 9° to 12° Centigrade, a temperature too low to allow putrefaction to take place. These washings are, however, potentially capable of causing and promoting a nuisance under suitable conditions of temperature, such as, during the summer months, exist in the creek into which they are discharged.

The creek above the outfall of the Kurth plant has the appearance of a normal stream; the vegetation along the bank close to the water's edge is in a green and flourishing condition.

The effect of the unstable barley washings on the stream is immediately discernible below the point of discharge; the general appearance of the creek is decidedly altered and very noticeable; the vegetation near the water's edge, from this point to the mill pond, is in a decaying condition.

It is readily discernible that the industrial waste from this plant is a contributing factor to the unsanitary condition of the creek, and this opinion, formed during the inspection, was substantiated by the subsequent analytical findings.

Briefly, the condition of the organic matter during the warm weather is so putrescible that the creek in its present state is practically a septic tank. This condition of affairs has come about gradually. There is an increasing amount of unstable organic matter passing into the creek, and it is certain that unless remedial measures are taken the nuisance will be augmented, and ultimately the condition of the creek will become practically unbearable at times.

At some previous time the capacity of the stream was suffi-

cient to receive and digest the organic matter then finding its way into the water. Gradually the amount of unstable organic matter has increased, until today the lower part of the creek at least, has an odor and appearance more characteristic of a septic tank than a stream.

The method of dealing with this problem is relatively inexpensive, and involves the restoration of a creek current to fair velocity; walking in the creek between James street and School street—a distance of about one quarter of a mile; and removal of most of the deposit from the bed of the stream between the above mentioned points—School and James streets.

At the present time the creek water is prevented from freely flowing into the Crawfish river by the dam at the "Columbus Mills." The spill board on the dam is so high that it not only causes stagnation of the creek water in the mill pond, with resultant precipitation of the suspended organic matter and accumulation of deposits, but the water in the creek itself is maintained in a stagnant condition. In order to allow the creek water to flow more freely and establish a fair current the spill board should be removed, and other measures taken if necessary, so that the foul creek water may be readily removed and oxidized by the oxygenated water of the Crawfish.

The banks of the creek should be walled between James street and School street at least; the walls which now exist at and somewhat above James street should be extended to School street in order to prevent the vegetation, which exists in abundance all along the bank, from falling into the creek, there to be deposited and subsequently putrefy. It is the putrefying vegetable matter along the banks and the putrefying vegetable deposits which are prime factors in the causation of the existing nuisance; therefore, the stream should be walled to prevent the vegetation from getting into the water.

The heavy deposit of organic matter is not only the most important cause of the annoying condition of the creek, but it is also the cause of the perpetuation of this undesirable state of affairs; practically none of the organic matter is removed by the movement of the creek water—rather, there is a constant increase in volume—and whenever the necessary temperature is reached —summer conditions—putrefaction sets in and a nuisance is at hand. The normal volume of pure water flowing through the upper creek is entirely insufficient to satisfy the oxygen require-

ments of the extensive deposits in the lower part of the stream. In consequence of this condition it will be necessary to remove most of the deposit if permanent relief is to be hoped for, and to secure this desired result most of the deposit between the mill pond and James street must be removed.

The Second Ward creek is in a putrefying and very poor sanitary condition, and measures should at once be instituted to abate this nuisance.

The sanitary condition of the creek may be reclaimed by restoring a reasonable current velocity; removing most of the deposit from the bed of the stream between the mill pond and School street; walling the creek between James street and School street; and purifying the industrial waste before it enters the creek.

The industrial waste from the Kurth establishment contributes to the insanitary condition of the creek and should be purified before it is discharged. The desired degree of purification may be obtained by a process of natural aëration.

As an alternative method of disposing of the waste, the city sewage disposal plant may be considered. The character of the waste is such that it may be successfully treated at the disposal works, but before this method of dealing with the waste could be instituted the capacity of the plant would have to be increased to about 540,000 gallons per day.

REPORT OF INVESTIGATION OF DISPOSAL OF INDUSTRIAL WASTES FROM THE PLANT OF THE MILWAUKEE RIVER CANNING FACTORY, MEQUON, WISCONSIN.

By E. J. TULLY, Chemist, State Laboratory of Hygiene, Laboratory of the State Board of Health.

The industrial wastes discharged from the establishment of the Milwaukee River Canning Company, located at Mequon and about one-half mile from the Milwaukee river, consist of two distinct types of effluent—pea washings, and acid vine juices.

The daily volume of pea washings—washings which always carry a considerable quantity of suspended matter—amounts to approximately 25,000 gallons. The vine juices, however, which daily pass from the silos,* do not amount to more than one-fiftieth the volume of pea washings, or approximately 500 gallons; but these juices make up for what they lack in volume by their disagreeable odor, pungency, acidity, and color. These latter characteristics are, of course, the result of fermentative and putrefactive changes which take place in the vines, part of which is stored in a concrete silo, the remainder being heaped into a large pile adjacent to the silo.

It has been the practice of the Company to discharge both wastes, pea washings, and vine juices, untreated, into a creek which flows, in a fairly direct passage, into the Milwaukee river, distant about one-quarter of a mile from the plant.

At this time, however, because of local complaints, the Company, realizing the advisability of abating conditions which

* Stack of vines referred to as silo, in this instance.

either constitute or may lead to the creation of a nuisance, and desiring to establish entirely satisfactory conditions and thereby eliminate complaints, have decided to separate the effluents and to subject each to a suitable method of treatment—sedimentation, and subsequent discharge of the effluent, by means of a pipe line, into the Milwaukee river, in the case of the pea washings; and filtration on the instance of the vine juices.

As a result of an inspection of the local topography and geological formations, and of the river with respect to condition and volume, it appears that the wastes may be satisfactorily disposed of by screening, sedimentation, and water carriage or dilution with reference to the pea washings, and natural filtration-seepage through the soil, which consists of sand and gravel, in the case of the acid vine juices.

The volume of the Milwaukee river at Mequon will always be such as to ensure a dilution of at least one to two thousand—a very high dilution and one which will preclude the possibility of creating a nuisance at this point or lower down the stream by the daily discharge of twenty-five thousand gallons, or even a considerably greater volume, of pea washings.

In view of the fact that the creek will no longer be burdened with the carriage of the concentrated and very objectionable acid juices, I have recommended that the pea washings effluent from the sedimentation basin be discharged directly into the creek instead of conveying it by means of a pipe line, as was originally intended, to the Milwaukee river.

As the flow of the water in the creek is somewhat sluggish at certain points, due to earthy deposits of one kind or another, I have advised the company's representative to remove the earthy obstructions, so as to establish and ensure a fairly good current, and thereby hasten the carriage and dissipation of the waste in the waters of the Milwaukee river.

This procedure, the removal of earthy obstructions so as to establish a fairly rapid current, will be more economical than the installation of a pipe line from the sedimentation basin to the river, and will, I believe, be just as effective and satisfactory a medium of removal as a pipe line. However, I have advised that the creek water carriage of the waste is on trial and that if adverse conditions arise, a pipe line directly from the sedimentation basin to the river will then be necessary.

In view of the fact that the daily volume of washings will ma-

terially increase with industrial growth, and in order to successfully treat the assumed future daily discharge, I have recommended that a concrete sedimentation basin, equipped with a screen, be installed in a designated location for the treatment of the pea washings. I have advised that a tank of the following general description and dimensions will be acceptable: Width, 15 feet; length, 10 feet; and a working available depth of 4 feet, 3 inches—that is to say, the depth from the bottom of the inlet and outlet pipes, which may be on the same horizontal or level, to the bottom of the tank is to be 4 feet, 3 inches. The affluent and effluent openings may be of the same diameter, 9 inches, with the inlet so sloped as to give the washings a downward movement or direction, so as to prevent direct crossing; and between the inlet and outlet pipes two concrete baffle boards 4 feet, 3 inches high should be located at such distances as to divide the tank transversely into three equal compartments. The total depth of the tank, from the top of the concrete cover, which will necessarily have to be one foot thick in order to support the pressure of heavy teaming, to the bottom of the basin, will be 6 feet. The screen, which is for the purpose of removing gross particles of vines, peas, etc., is to extend transversely from one side of the top to the other, and may be any desired width, but a width of one and one-half feet will be sufficient. The location of the screen is to be above the affluent or inlet pipe, so that the washings may be discharged onto the screen, and the collected refuse readily removed by shovels.

I have given to Mr. Nieman, president of the company, at his request, a sketch of the proposed sedimentation tank, and have advised that minor dimensions and details of construction may be selected to suit local conditions, but that the major dimensions as to width, length and depth be retained. The relatively small depth of the tank, is necessitated in this case by the high ground water level.

Such a process of treatment of the washings, screening and sedimentation, will tend to produce a clear and satisfactory effluent of such nature that it may be discharged, by means of a covered pipe line, directly into the creek with practically no danger of injuring the stream.

The acid vine juices are of such an obnoxious nature that it is advisable and desirable to dispose of this material by utilizing the gravel and sand subsoil as a medium of purification and re-

moval, that is, to subject the acid waste to natural filtration as a method of treatment. As the subsoil in the immediate neighborhood is composed of gravel and sand, this method of disposal offers an effective and at the same time an economical process of treatment.

I have, therefore, advised that the acid juices be discharged by means of a pipe line from the silo and stack into a covered excavation in the sand, from which bed the waste will seep through the layers of sand into the ground water, and in this manner be both purified and removed.

According to information received, the daily volume of acid juices discharged totals about 500 gallons; but on account of the high hydraulic or ground water level, which will not permit rapid filtration of the waste, that it will be advisable to have a filtration bed of such capacity that it will hold about 1200 gallons, or somewhat more than two days' discharge. Assuming 500 gallons to be the average daily volume of acid waste discharged, an excavation 7 feet long, 7 feet wide, and 4 feet deep will, therefore, afford sufficient capacity to accommodate practically two and one-half days' flow.

It is very probable that the disagreeable odors complained of were, for the most part, due to the products of pea vine fermentation—gases and acid juices. A mass of pea vines, etc., have been collected into a huge open pile or stack adjoining the single concrete silo, which is taxed to its capacity, and during the warm weather a vigorous fermentation of this mass of organic material takes place, resulting in the generation of gases, which escape into the atmosphere, and the production of acid juices, which seep through the pile and onto and over the surface of the ground. The juices have escaped from the bottom of this mass and have flowed in small rivulets over the surface of the ground in the immediate vicinity of the pile. It appears that the gases and juices derived from this uncovered mass of vines, together with the juices from the concrete silo, which were discharged into the creek, contributed the mephitic and obnoxious vapors objected to.

Under the new arrangement of disposal, the juices produced, both from the uncovered stack of vines and from the concrete silo, are to be discharged through a pipe line into the covered excavation previously mentioned, where they will be disposed of

by filtration; and the creek will be relieved, to this extent, of the care of this material.

It is quite probable that by next spring the oxidation of the superficial portion of the uncovered mass or stack of vines will have proceeded to such an extent as to lead to the production of a hard and relatively impermeable shell through which the juices can not pass laterally, and, therefore, there should be but little, if any, odor arising from this pile of material—the juices passing down through the pile by gravity will be removed by pipe line to the excavation where they will be disposed of. However, if the condition of this uncovered mass proves to be still unsatisfactory and really objectionable, the erection of a concrete silo for this material is indicated as a solution of the difficulty.

SUMMARY AND CONCLUSION.

The wastes from the plant, pea washings and acid vine juices, may be economically and satisfactorily disposed of, the former by a combination process of screening and sedimentation, the latter by natural filtration.

In conclusion, therefore, I recommend that the pea washings be screened, and then subjected to sedimentation in a concrete tank; and that the effluent be discharged through a pipe line directly into the creek.

In order that the effluent may be readily carried through the creek to the Milwaukee river, the existing earthy obstructions in the creek which retard the free movement of the water and cause the formation of pools, should be removed so that a good current may be established for the quick carriage of the effluent to the river. As the effluent will be practically free from suspended matter, it does not seem probable that its direct discharge into the creek will cause any difficulty in that body of water in the future. However, if unsatisfactory conditions arise at any time as a result of a combination of circumstances, it will be advisable to dispose of the effluent by direct discharge through a pipe line from the sedimentation tank to the Milwaukee river; but it does not now seem probable that such an installation will be necessary.

The acid juices may be satisfactorily treated by natural filtration and I, therefore, recommend that this waste be discharged

by means of a pipe line into a covered excavation in the ground and be disposed of in this manner.

If objectionable odors and conditions continue to be produced in the future by the uncovered stack of vines, which, by the way, has fermented to a very considerable degree, the most effective means of eliminating this source of annoyance is to install a concrete silo, and transfer and store this material in it. If a silo be later erected, it too should, of course, be connected with the excavation for the disposal of the acid juices.

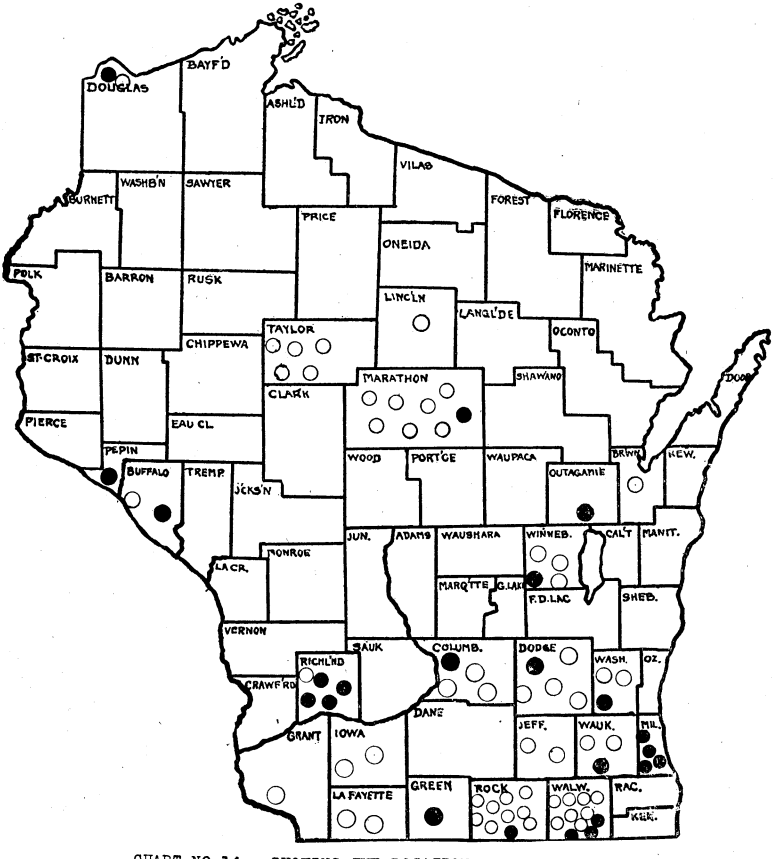


CHART NO 14 - SHOWING THE LOCATION OF CASES AND DEATHS FROM INFANTILE PARALYSIS DURING THE CALENDAR YEAR OF 1912.

CASES - O DEATHS - ●

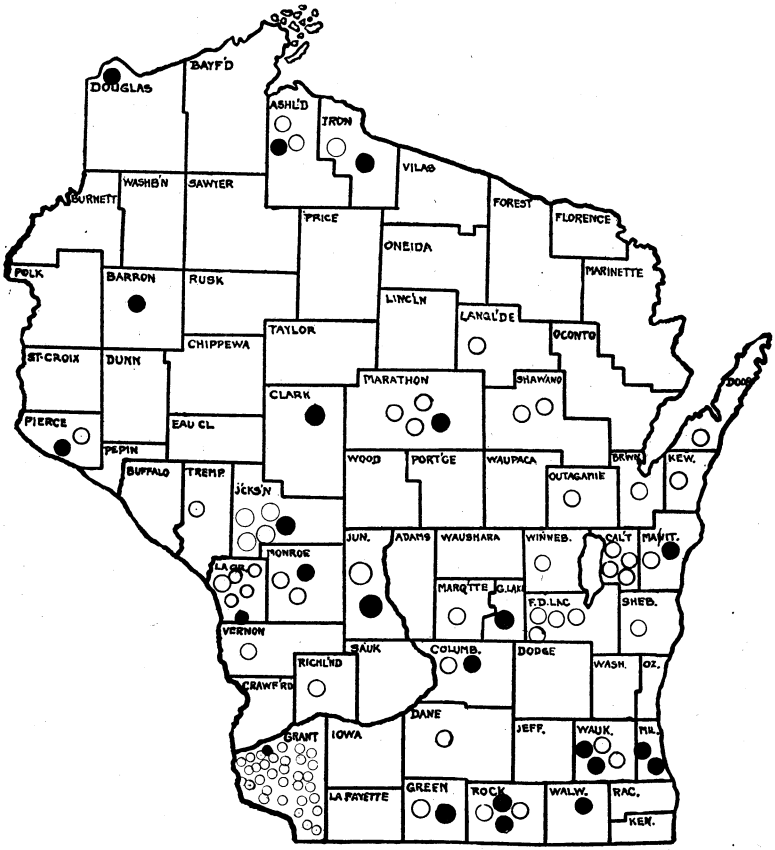


CHART NO. 15 - SHOWING THE LOCATION BY COUNTIES OF CASES AND DEATHS FROM INFANTILE PARALYSIS DURING THE CALENDAR YEAR OF 1913.

CASES - O DEATHS - ●

REPORTS OF DEPUTY STATE HEALTH OFFICERS.

The movement of public health legislation in more recent years has been strongly toward centralization of authority. There is now much experience which shows that local health administration is more efficient when under regular supervision and some direct control of the central authority of the state. It was with this end in mind that the Legislature of 1913 authorized the appointment, by the State Board of Health, of five deputy State Health officers, who are appointed by the State Board of Health, and who shall hold office during efficiency and good behavior.

The state has been divided into five sanitary districts, and each deputy is given charge, under the supervision of the State Board of Health, of the work in one of these districts.

The next step is the employment of a sufficient number of well paid, full time health officers. Several of the larger cities of the state have already provided for such health officers and the State Board of Health is encouraging similar action in many other cities. We believe the law, providing for the appointment of local health officers, should be further amended so as to authorize several municipalities, occupying contiguous territory, to employ a health officer jointly. This will lessen the expense for each municipality and will greatly increase the efficiency of the health work.

The following is a brief summary of the work of each deputy state health officer from the date of their appointment to June 30, 1914.

REPORT

By DR. G. W. HENIKA, Madison, Wisconsin.
Deputy State Health Officer, First District.

I have the honor of submitting to you my first annual report as Deputy State Health Officer for District Number One, covering the period from October 1st, 1913 to July 1st, 1914. This district includes the counties of Adams, Columbia, Crawford, Dane, Grant, Green, Iowa, Juneau, Lafayette, Marquette, Richland, Sauk and Vernon.

A total of two hundred and eighty-seven general sanitary and special surveys were made in this district up to July 1st, 1914.

TABLE SHOWING RESULTS OF 287 SANITARY SURVEYS AND SPECIAL INSPECTIONS.

No.	Nature of survey.
107	General sanitary surveys of municipal health units.
123	General surveys of slaughterhouses.
15	Special surveys of slaughterhouses.
10	Special surveys of sewers, toilets, nuisances, etc.
2	Special surveys for collecting vital statistcs.
1	Special survey of rendering plant.
4	Special surveys for steam pollution.
1	Special survey for anterior poliomyelitis.
2	Special surveys for scarlet fever.
2	Special surveys for measles.
10	Special surveys for smallpox.
1	Special surveys for diphtheria.
1	Special surveys for diphtheria.
3	Special surveys for schools.
5	Special surveys for stockyards.
287	Total.

NUISANCES UPON WHICH ORDERS WERE ISSUED, WHERE NECESSARY, AND THE NUISANCES ABATED.

No.	Character.
12	Overflowing cesspools.
37	Unsanitary toilets and urinals on private property.
28	Garbage, manure, hogs. skunks, etc.
5	Railroad stockyards.
97	Slaughterhouses.
1	Rendering plant.
3	Creamery waste.
3	Stream pollution.
34	School toilets.
16	Railroad station toilets.
236	Total.

In addition to the above, five suspected pollutions of water supplies and three suspected pollutions of ice supplies were investigated.

286 hotels and restaurants were also inspected. This work was done wherever the inspection could be made without interference with my public health work. This assistance was given the hotel department to avoid a duplication of visits to the same locality by inspectors from the same department.

TABLE SHOWING LOCATION AND NATURE OF SPECIAL SURVEYS FOR COMMUNICABLE DISEASES.

Location.	Diseases.
Mt. Horeb	Smallpox.
Cassville	Smallpox.
Theresa	Smallpox.
Portage	Smallpox.
Cambridge	Smallpox.
Browntown	Smallpox.
Dill	Smallpox.
South Wayne	Smallpox.
Middleton	Smallpox.
Oxford	Smallpox.
Boscobel	Measles.
Dodgeville	Measles.
Mondovi	Scarlet fever.
Dill	Scarlet fever.
Mt. Horeb	Diphtheria.
Cassville	Typhoid fever.
Fennimore	Anterior poliomyelitis.
Lancaster	Anterior poliomyelitis.
Platteville	Anterior poliomyelitis.

MAKING DIAGNOSIS.

In fifteen of the nineteen instances where it became necessary to make a special survey for outbreaks of communicable disease, the presence of the deputy was necessary to decide the diagnosis. There was very little difficulty in establishing quarantine after the identity of the disease was once established. Although a disagreement among the local physicians always makes the duties of the health officer harder to perform, in no instance was it necessary to resort to the law to secure enforcement of quarantine.

SCARLET FEVER.

In making one of the special inspections for an outbreak of scarlet fever, I found that some fifteen cases had occurred in the neighborhood without a physician being called. A severe case finally developed which required medical attention and the presence of the disease became known. The school was closed and thoroughly fumigated and all pupils who had been exposed were isolated for ten days from date of last exposure. The teacher who had experienced an attack of the disease during childhood was allowed to leave after having her clothing fumigated and person disinfected. All homes where previous suspicious cases had occurred were fumigated and the patient isolated for six weeks from the beginning of the disease. Rigid quarantine was maintained upon those cases that had not recovered and the outbreak was soon controlled.

SMALLPOX.

One of the special inspections for smallpox developed the fact that the patient, a man of thirty, had been severely ill for five days and at the time of my visit his face, trunk and arms were covered with pustules. The health officer's family had been notified, but the health officer himself was away threshing; therefore, no quarantine had been enforced or card placed upon the house. The health officer and town supervisor were both notified that if they did not immediately comply with the law they would be prosecuted. The house was placarded by me. The attending physician vaccinated the immediate members of the family and all other persons who were exposed (15 in all), with the exception of two school children who had been exposed and whose parents refused to have them vaccinated. These children were quarantined for fourteen days from the date of last exposure. No further cases developed.

SUSPECTED TYPHOID CARRIER.

The city of Columbus had been having cases of typhoid fever occuring annually for several years and upon a study of the situation it developed that almost without exception the families wherein the disease made its appearance secured their milk supply from a family whom we will call Johnson. Upon interviewing this family in company with the local health officer it was determined that Mrs. J. had suffered an attack of typhoid fever several years previous, and had suffered more or less pain in the regions of the gall bladder ever since. Samples of the blood, urine and feces were collected and forwarded to the State Laboratory of Hygiene, the State Board of Health laboratory. A motile bacillus was found that closely resembled the bacillus of typhoid fever. A positive diagnosis was not made, however, as the bacillus did not give an agglution reaction with prepared rabbit's blood. The bacillus also failed to give agglutination with positive human blood. The family refused to furnish additional specimens; therefore, further study of the case was

prevented. The Johnson family was forbidden to offer any milk for sale and sufficient publicity was given the cases so that anyone buying milk of them would know they ran the risk of getting the disease. The family was also instructed how to protect themselves against reinfection and were advised to boil their milk. As a result of these precautions no cases of tyhpoid fever have appeared since May, 1914. Appropriate legislation granting health officers more authority to restrict the movements of carriers and enabling them to make more thorough and repeated examinations of swabbings and cultures from the nose and throat, blood, urine and feces, would aid materially in limiting the spread of these diseases.

DIPHTHERIA CARRIER.

The outbreak of diphtheria occurring at Mt. Horeb and adjoining townships, April 20th to 25th, 1914, shows conclusively the great danger in not enforcing more strict rules governing the movements of convalescents who had been confined in contagious wards and others who may be possible carriers until every possible means has been employed to ascertain that they are free from pathogenic bacteria or infection.

A young man, who we will call Mr. B, was convalescing from scarlet fever. He was allowed to leave the contagious ward of a Chicago hospital and came direct to Mt. Horeb to visit a brother who lives several miles in the country. At the time of his arrival Mr. B. had a severe sore throat, but otherwise appeared to be recovering nicely. Within a few days after the arrival of Mr. B, his brother, Mr. A. B. developed a severe sore throat and consulted a physician who pronounced the case tonsilitis and allowed the patient to return home. Mr. A. B. then called at the home of a Miss G—and spent some time there. This young lady was attending high school at Mt. Horeb, and the day following the visit of Mr. A. B she returned to her studies. Three days from the date of exposure Miss G became ill and called the same physician who attended Mr. A. B. The case was diagnosed as peritonsilar abscess and two attempts made within the next few days to relieve the swelling by lancing the throat. The girl rapidly grew worse and consultation was called. The diagnosis of diphtheria was made, antitoxin administered and later intubation was resorted to, but without avail as the patient lived but a short time. One of the consultants, who assisted at the intubation, also contracted the disease. Antitoxin was given promptly and the doctor made a good recovery. Cultures taken from the doctor's throat and from other cases directly traceable to this first case all showed positive cultures of the Klebs-Loeffler Bacillus. The direct result of the failure of the Chicago authorities to positively ascertain that Mr. B was not a carrier of pathogenic bacteria before allowing him to leave the hospital was five cases of diphtheria and two deaths. As soon as Mr. B discovered that he was the probable cause of the outbreak of diphtheria, he took the

first train for Chicago and the local board of health or myself did not have the opportunity of examining him or making cultures from his throat.

This outbreak also shows the necessity of isolating all suspicious cases until a positive diagnosis can be made and the advisability of taking cultures from all cases of sore throat regardless of their clinical picture.

DIPHTHERIA.

Of the seventy-eight cases of diphtheria reported in this district during the nine months covered by this report, eleven cases were reported during the months of October, November and December, 1913—six of these cases were in Madison and five were reported from other portions of the district.

This is entirely too large a number of cases of diphtheria for this district to have in a period of nine months, and the number can be greatly reduced by enforcing a more rigid quarantine and confining all cases until repeated cultures from the nose and throat prove that the patient is free from pathagenic bacteria and is incapable of being a carrier. More attention should be given to tracing out the source of infection upon the appearance of the first case and concentrating greater energy upon stamping out the disease and removing the cause of the epidemic.

TYPHOID FEVER.

Eight counties reported a total of thirty cases of typhoid fever while five counties showed no reported cases. Of the six reported cases in Dane county, five were in the city of Madison and one in the city of Stoughton. Six cases were reported from Vernon county;—five of these cases occurred in Viroqua and one in the town of Whitestown. Six cases were reported from Grant county;—three of these cases occurred at Cassville, one at Blue River and one at Bloomington.

Typhoid fever is an easily preventable disease, and for every case of this disease and for every death resulting therefrom, someone is directly responsible. The fact that thirty cases of this disease occurred in the district within the past nine months is proof that someone directly connected with each of these cases have not done his full duty. Too little attention is given cases where trained nurses are not employed. The so-called "practical nurse" frequently thinks she knows more than the attending physician and, as a result, the excreta may or may not be properly disinfected. Another point that is far too frequently given no attention is the possibility of a patient remaining a carrier after apparent recovery from the disease. We will never stamp out this disease until it becomes compulsory for every patient to disinfect all stools and urine for two months after recovery or at least until repeated bacteriological examinations of his blood excreta and urine prove that he is not a carrier. In addition to this precaution, all available methods must be employed to destroy the infection in every case.

WHOOPING COUGH.

This is another disease of childhood that is given far too little attention by both physicians and the public. Seventy-seven cases were reported from this district, Sauk county leading the list with thirty cases, Marquette seventeen, Dane twelve, Columbia seven, Crawford six, Richland and Vernon two each, and Adams one. With five counties showing no cases reported, this should convince some of the mothers who are firm in the conviction that their children must have these diseases during childhood that by the exercise of a little care many of the children will escape. Whooping cough is a very fatal disease among young children and as a result every precaution should be taken to prevent any unnecessary exposure.

SMALLPOX.

The counties of Columbia, Dane, Grant and Richland each had extensive epidemics of smallpox during the year. The conditions governing the spread of the disease were similar in each locality. The period of time elapsing since vaccination had been performed to any extent was from ten to fifteen years, thus large numbers of the residents were susceptible to the disease. The outbreak was, as a rule, of a very mild type, so mild in fact that many persons openly declared they preferred the disease to vaccination. The mildness of the cases also caused many physicians to diagnose the disease, upon its first appearance, as chicken pox and patients were permitted to pursue their usual vocations and mingle with the public at will.

At Windsor and De Forest, I found clerks in stores with their faces and hands covered with crusts and dried pustules, and at Portage one physician, who had diagnosed the early cases as chicken pox, refused to alter his diagnosis even when entire families, including all adults not protected by vaccination or previous attacks of smallpox, became ill with the disease. Such physicians, who are unable to diagnose smallpox or refuse to alter their diagnosis when shown reasonable evidence of their error, are a great stumbling block to the enforcement of quarantine and seriously interfere with the successful stamping out of epidemics of the disease.

In all communities where the disease made its appearance, the twenty-five day vaccination clause of Section 1413—1 was enforced and the outbreak was soon controlled. It was found that vaccination was more readily accomplished wherever the local school board provided free vaccination for all pupils and teachers than when it was left to the parents to secure the required vaccination certificate. In no instance was it found necessary to close the school and in every locality where the local school board had closed the school before the local board of health was consulted, they were persuaded to open the school and secure general vaccination among the school children by enforcing the twenty-five day vaccination clause.

At Mt. Horeb and several other places, some difficulty was encoun-

tered by the local authorities in enforcing quarantine, but, by threatened arrest and prosecution, the offenders submitted to the necessary restriction of their personal liberties.

If physicians throughout the state continue to diagnose these mild cases of smallpox as chicken pox, more stringent rules must be adopted to control these doubtful cases and not allow them to run at large under the guise of chicken pox.

SCARLET FEVER.

The counties of Columbia, Dane and Green show a large number of cases of scarlet fever.

Of the thirty-four cases reported from Columbia county, twenty-two occurred in the city of Portage, four in the village of Cambria, four in the town of Scott and four scattered.

Of the fifty-seven cases reported in Dane county, thirty-two were from the city of Madison, four from the village of Cambridge, five from the village of Belleville and five from the city of Stoughton with seven cases scattered.

Of the forty-four cases reported from Green county, eighteen cases were in the village of Brodhead, eight in the township of Sylvester, five in the township of Jefferson and thirteen scattered.

MEASLES.

Measles seems to be the one disease that has run rampant throughout this district during the past season; Dane county reports 496 cases, Crawford 402, Grant 372, Columbia 167, Vernon 162, Iowa 134, Richland 104, Sauk 63, Green 62, Juneau 14, Marquette 8, Lafayette 5, Adams 3,—a total of 1,992 cases resulting in three deaths.

This disease is often regarded by the laity and by some boards of health as so mild a disease that its prevention is thought of little importance, and little effort, if any, is made to limit its spread. The possibility that every person at some time in his life will have the disease is no justification for unnecessary exposure. The fact that the disease is usually spread by the patient and that 1,992 cases, with three deaths were reported in this district during the past nine months, proves conclusively that more rigid rules should be adopted in handling this disease.

There is no valid reason that can be advocated against the quarantine of this disease that cannot be offset by the saving in time alone that is lost to the pupils of the schools in this state. The average case of measles will require the absence of the pupil from school for at least fifteen days, which will give a total loss of 19,880 school days from the cases reported during the past nine months in this district alone. Or to better illustrate the loss in school attendance is approximately equivalent to the amount of time put in at school by seventy school children during the entire year. Surely, this economic waste of time must be of sufficient value to require more attention to be given this disease.

In addition, the fact remains that, even though the attack of measles may not have been in itself severe, conditions are often left, the results of which are not seen until long afterward. Chronic glandular enlargements which may ultimately become tuberculosis, chronic bronchitis, chronic laryngitis, sub-acute or chronic nasal catarrh, hypertrophy of the tonsils, and adenoid growths of the pharnyx are all frequent sequelae of measles.

Therefore, measles should be placed among the quarantinable diseases and a serious effort put forth by the State Board of Health, as well as all local boards of health, to limit the spread of this disease. I have purposely omitted the financial side of this subject, but there can be no question that the cost in labor and money expended in the care of these 1,992 cases represents a substantial sum.

TUBERCULOSIS.

The report of 135 new cases of tuberculosis in this district during the past nine months shows the crying need for county sanitoria to give these patients proper care. Every person with tuberculosis, unless taught to properly disinfect the sputum and properly care for himself is a constant source of infection to others.

This education can be given to some extent in the home, but not as successfully as in an institution where the patient comes in contact with other cases in various stages of the disease. He gets a moving picture as it were of his own case, as he will be if he reaches the more advanced stages of the disease. The importance of greater care of the infectious material will be brought home to him in the sanitorium as it never can be in his own home where he is the only patient.

The preliminary steps have been taken in several counties to secure this needed protection to the public, but so far no county has been successful in securing the necessary funds. A more complete report of incipient cases is being obtained annually, although there are many cases that are not reported. The report of ten deaths from tuberculosis in Lafayette county with only one case reported shows very plainly that the general public, as well as physicians, are criminally negligent in failure to report all cases of this disease.

While making the surveys in each health unit, an effort was made to personally urge upon each physician in the locality the necessity of making an early diagnosis and reporting all cases of communicable disease promptly, especially tuberculosis. The necessity for the accurate reporting of all births within the five day limit was also taken up at this time and the majority of physicians expressed their willingness to coöperate in securing these results. This opportunity was also taken to give short talks upon communicable diseases, carriers, hygienic and personal cleanliness to high school pupils throughout the district.

MENINGITIS.

Twelve cases of this disease were reported. One case from Adams county, six cases from Dane county, two cases from Grant

county and one case each from Green, Juneau and Lafayette counties. All six cases in Dane county occurred in Madison and were scattered throughout the nine months.

ANTERIOR POLIOMYELITIS.

There has been no epidemic of this disease in the district during the past nine months. Four cases were reported from Grant county in October, 1913; these were cases occurring at the end of the severe epidemic that occurred in Grant county during the summer months.

A survey was made of this epidemic October 2, 1913, resulting in a total of thirty-two recognized cases. Many cases of the abortive type existed throughout this outbreak, some of which were of such a mild nature that medical attendance was not secured. All physicians were requested to report all suspected cases of the abortive type as well as the more pronounced cases. No new cases developed after the first severe frost, one sporadic case was reported from Columbia county and one from Vernon county.

EFFICIENCY OF THE AVERAGE HEALTH DEPARTMENT.

The work accomplished by a majority of the local boards of health is far from being what it should be when measured from a sanitary standpoint. While there are a few live, active men acting as health officers who do not allow the fear of injury to their business or private opinions of others to swerve them from doing their duty and cleaning things up, it is impossible under existing conditions to secure more than fifty per cent efficiency from the average health officer or local board of health. This does not mean that they are all poor for the efficiency of some health departments in cities runs as high as 70 to 75 per cent, in villages from 40 per cent up and in townships from 20 per cent up. There are many reasons why this is true. The health officer is seldom paid one-tenth what his services are worth to the community. The average salary for health officers in villages up to 1,000 population is from $5.00 to $25.00 per annum, with additional compensation for certain kinds of extra service, and these same villages pay their village marshal from $10.00 to $40.00 per month. In cities with a population of at least 5,000 the compensation of health officers averages from $50.00 to $200.00 per annum. There is one city in this district of 2,500 population where the health officer is paid $50.00 with $5.00 for postage and incidentals, a total of $55.00 per year. The chief of police is paid $1,200.00 per annum to protect the personal property and drive a few tramps out of town. In this instance the health officer is a live wire and has improved local conditions one hundred per cent. This work has been accomplished not only at a great financial loss to himself, but in doing it he has been compelled to make many personal enemies.

Full efficiency for local health officers will never be realized until the public is willing to pay a just compensation for their services, or full time men are employed who are entirely independent of local politics. At the present time village and city authorities are prone to follow the line of least resistance and as a result they often select a man for health officer who will do nothing and thus they believe save them trouble and expense. Active agressive men in this field who take pride in their work, who make their office a bureau of information for the public, are few and far between. Too often the public view the health officer as a compiler of statistics, a placarder of houses, a trouble maker or a public prosecutor. It is often true the health officer does not earn even the meagre salary his office commands, but that is the fault of the man, not the office. There is plenty of work to be done in every community and the modern health officer does not sit in his office and wait for complaints to come to him, but gets out and investigates for himself. He is a compiler of statistics because he digs up those cases which have not been reported by physicians and classifies all as a basis for the formulation of methods for the eradication of disease. He is a public instructor, teaching how health may be maintained and explaining that quarantine rules and placards are intended primarily for the protection of the general public. He is a true sanitarian who supplies information on the various branches of public health work. The health officer of necessity must be a critic. His duty is that of pointing out to others the obnoxious or the dangerous. The man who criticizes without suggesting a remedy is not rendering the best service. His work is not merely to inspect, but also to improve sanitary conditions wherever found in his jurisdiction. To simply condemn without detailed directions for methods of improvement produces little result except that of antagonism. The average individual resents a criticism unless suggestions for improvements are offered. He should not alone formulate, but must also execute plans for saving human life. He must not only guard the city's water supply and milk supply, but he must see that an adequate method is provided for caring for the sanitary disposal of the city's sewage and garbage, streets, alleys and back yards must be kept clean, quarantine laws enforced without fear or favor, all cases of communicable disease must be followed up and the premises and patient's clothing fumigated. All vital statistics must be collected and reports made to the proper authorities promptly. The light, ventilation and toilet facilities of all public and parochial schools should receive his careful attention, likewise the water supply if different from the water supply of the city. The condition of all butcher shops, bakeries, slaughterhouses and public buildings should come under his jurisdiction. Nuisances must be abated and a general sanitary supervision of his entire district maintained at all times, and last but equally important, he should

keep an itemized record of all of the activities of his health department and make an annual report with recommendations for future needs so that the people may know what has been done, what is proposed to be done and the actual costs involved. Such a man is invaluable in any community and should receive just compensation for his services.

VITAL STATISTICS.

It became necessary in but two instances to collect the vital statistics of a community at the expense of the village. At Albany, it was due to neglect on the part of the village clerk. By checking over the files of the local paper and consulting the local physicians, the vital statistics, which were not reported, were collected. Prosecution was not resorted to in this case as the village clerk settled the account himself and promised to be prompt in the future.

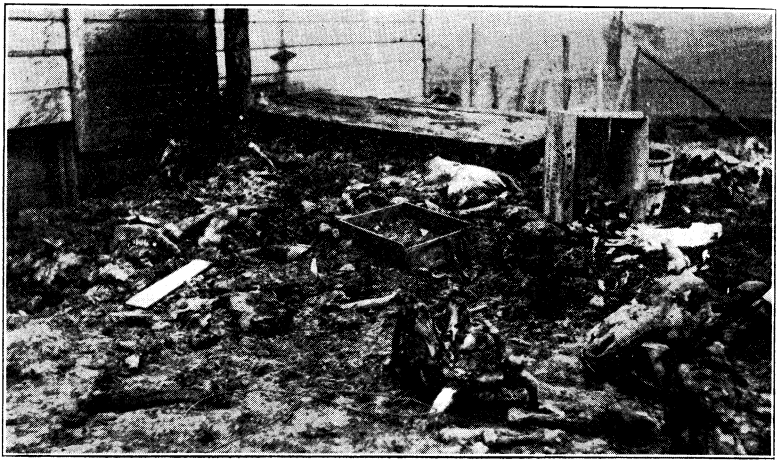
The other case was at Ridgeway. In this instance, the resident physician was more to blame than the village clerk. The physician claimed that the state of Wisconsin did not have authority to compel the reporting of vital statistics. This man should have been prosecuted, but upon taking the matter up with the district attorney, I was given to understand that it would be impossible to secure a conviction, and the case was dropped upon the attorney assuring me that the doctor would report promptly in the future, which I believe he has done. In this case, the village board paid the cost of collection.

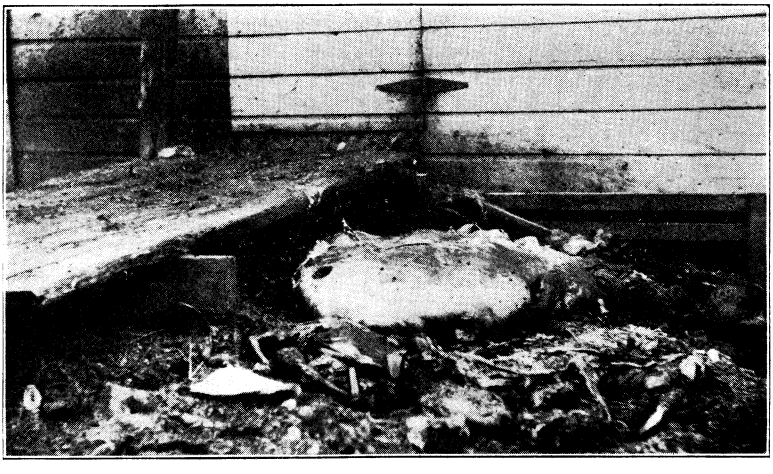
SLAUGHTERHOUSES.

A total of one hundred and twenty-three slaughterhouses were inspected and a large majority were found in a more or less unsanitary condition. Orders were issued requiring the bringing of each slaughterhouse up to the standard required by the rules of the State Board of Health. Second inspections were made in a few instances where necessary. In every case a general clean-up followed the inspection, and while all slaughterhouses in the district have not been able to meet all of the requirements, they are complying with the rules as fast as possible. The photographs in this report will give a very good idea of the condition existing upon the first inspection of many slaughterhouses.

Centralization of the slaughtering industry was advocated wherever there was a sufficient number of shops to warrant the measure. Wherever we have one well-equipped abbatoir, which is used by all of the butchers of the city, we find them clean and well kept. There is a great necessity for eliminating the small, poorly equipped slaughterhouse wherever possible.

THE FOLLOWING CUTS HAVE BEEN MADE FROM ACTUAL PHOTOGRAPHS SHOWING THE INSANITARY MANNER IN WHICH A LARGE NUMBER OF SLAUGHTERHOUSES IN THE STATE, NOT UNDER FEDERAL SUPERVISION, WERE CONDUCTED PRIOR TO THE ADOPTION AND ENFORCEMENT, BY THE STATE BOARD OF HEALTH, OF RULES AND REGULATIONS GOVERNING THE CONSTRUCTION AND OPERATION OF SLAUGHTERHOUSES.





EFFICIENT HEALTH DEPARTMENT.

An efficient health department, be it located in a town, village or city, must have, if it is to be active and efficient, the hearty co-öperation and confidence of the public. In addition the health officer must be a fearless man who will not allow politics or personal favor to interfere with his work. In every instance where the right type of man can be found, he will do better work if he is a physician. If a physician is afraid his duties as health officer will prevent a few dollars from reaching his pockets, he is the poorest man for the office you can select. In addition to securing an active, aggressive man as health officer, the personnel of the other members of the board should not be overlooked. These men must have sufficient backbone to pull together and support the health officer at all times. There is nothing that discourages a health officer more quickly than to have the other members of the board support him in a half hearted manner or not at all. There are several boards of health in this district whose work has been a total failure for this reason alone.

CITY.

As an illustration of what an active health officer can accomplish in one year in a city of 2,500 population, I may enumerate some of the things actually accomplished by the health officer mentioned elsewhere in this report who receives the munificent salary of $50.00 per year. In addition to instituting a general clean-up of streets, alleys, and backyards, which has been done, he has secured by hard work 1,090 feet of sewer main and 1,418 feet of city water extension. As a result of this work he has succeeded in removing over seventy outside toilets which were replaced with inside flush toilets, and more are still going in. The vital statistics are all well collected and prompt returns are made to the State Board of Health. Communicable diseases are promptly reported and all quarantine rules strictly enforced. The fumigation and disinfection following these cases are personally attended to by the health officer and the public schools are fumigated at each term or three times a year and oftener when necessary. The city water supply is carefully looked after and frequent samples analyzed to insure early detection of pollution by surface or drainage water. He has been untiring in his efforts to secure the abatement of a creek nuisance caused by stream pollution and stagnant water of a small stream running through the city. He has been of material assistance in securing the restriction of the sale of milk by a family containing a supposed typhoid carrier. Samples of blood, feces and urine were collected by the health officer and forwarded to the laboratory. The city has had no cases of typhoid fever since May, 1914, and its city schools have been remarkably free from epidemics of communicable disease.

THE PHYSICAL EXAMINATION OF SCHOOL CHILDREN AND THE SANITARY INSPECTION OF SCHOOLS.

Every advance in civilization is made with fierce opposition. Jenner's vaccination for the prevention of smallpox was not more fiercely assailed than are the regulations of health boards for quarantining cases of comunicable diseases and thereby preventing their spread. The public does not really care to have physicians assume the role and fulfill the duties of guardians of the public health and opposes their efforts obstinately, as soon as these are productive of the slightest inconvenience or hardship to themselves. On the other hand the same public is quite ready to blame the physician for the spread of any contagion and for physical conditions which might have been prevented by attention to the orders of the medical attendant. We see the same unreasonable attitude manifested throughout many portions of the state today in the foolish objections which are made against the sanitary inspection of schools.

Parents who ought to be thankful for having their attention called to incipient irregularities in the physical or mental makeup of their children, at a time when attention to them promises the greatest results, resent the determination of such irregularities by physicians employed by the municipality as an unwarrantable interference with their personal rights, and those parents who are most careless in their attention to matters of hygiene and sanitation are most vindicative in their opposition.

Physical examination is a very important link in the chain of prophylaxis. If we consider the alarming frequency of abnormal vision, of spinal deviations, of incipient tuberculosis, of adenoids, and of similar troubles, which, if allowed to progress, are almost certain to prevent a wholesome and normal development of the child, we wonder that any parent could be so utterly foolish and fatuous as to object to these facts being brought to their knowledge, and how they could be so criminally negligent as to refuse to give them proper attention. Medical inspection and examination of school children has long passed the experimental stage, and it is pleasing to note that some of the more progressive cities in this state have a well organized system of school inspection. The rural schools need this inspection fully as much as the city schools. In addition, the water supply should be looked after, the facilities for frequent cleansing of the hands and face, the use of the individual towel, and an especial effort should be put forth to obtain better toilet facilities than are found at the majority of schools throughout the state. Over 75 per cent of all school toilets inspected by me were not clean and sanitary, many were improperly constructed and provided no light or ventilation. A large number were found in a filthy condition and were unfit for anyone to use. The excuse that many of the school boards give is that the school children are nothing but little animals and that they will not stay clean if they clean them up. Nothing could be farther from the truth. If the school

boards will show some pride in their schools, and construct a modern sanitary toilet, varnish the seats, screen the windows and paint the interior as well as the exterior, they will find the pupils and teachers will not only show a pride in keeping these clean and neat, but will severely punish any lawless child who may violate the rules. You cannot blame a school child for not showing more respect for the average school toilet, when the condition of some of them is known.

The general health conditions throughout the district are excellent; however, there is always room for improvement, and the campaign for better sanitary conditions in each health unit must bear good fruit. A more rigid quarantine enforced by local authorities wil materially lessen the number of cases of communicable disease. More attention, in the future, should be paid to carriers and early cases of all communicable diseases should receive more attention than they do at present. Whenever diphtheria or scarlet fever and all diseases of like nature make their appearance in a community, prompt and intelligent action by the local board of health should limit the outbreak at once. Measles must receive more attention and should be placed among the quarantinable diseases. This is urgent. County Fair Associations and town, village and city school boards must be made to see the importance of installing sanitary toilets and keeping them clean. The general public must be taught the importance of cooperating with the local health authorities and assist in enforcing a rigid quarantine instead of violating it upon the slightest pretext as at present. Parents should be taught that a large majority of the communicable diseases of children are unnecessary and preventable, and should be educated in the methods of protecting their children against them Any parent who knowingly covers up a case of any of the dangerous communicable diseases or violates the quarantine for same and thereby causes the fatal illness of other children is just as guilty morally as though he had used a shot gun.

There are several localities in this district which have been using drilled and dug wells for cesspools. This is a very dangerous procedure and must sooner or later pollute the local water supply. If a one or two compartment tank is utilized to treat the sewage bacteriologically before discharging it into the deep wells, it will lessen the danger of pollution materially.

The old style shallow cesspool is certain to pollute a large area surrounding its location and the construction of single compartment cesspools is prohibited in the future by sections 57 and 58 of the new plumbing law.

REPORT

BY DR. G. E. HOYT, MILWAUKEE, WISCONSIN, DEPUTY STATE HEALTH OFFICER, SECOND DISTRICT.

Fundamentally essential to advance development of public health is an intelligent and morally imbued people. Equally basic is the social conscience and appreciation, patriotism born of a vitalizing sense of community obligation and service. Given these, and a spontaneity of result at once develops that minimizes administrative function and social control, and tends to the ideal. Such interpretation needs but limited guidance to procure the best and most enduring fruits in public health work.

Lamentably, our population, as evidenced by the experience of the past and of today, has not, in all of its individual and social composition, attained to such development, the inevitable consequence being that too often the mental and moral standards of the weaker strata determine the progress and results obtained, as a whole.

Manifestly, the whole is no stronger than its weakest part, and conspicuously is this verified in dealing with that type of human disorders known as the communicable diseases. They are diseases of social contact and community relation in which "no man lives unto himself, alone." In his primitive periods, as well as in the complexities of more modern times, the gregariousness of man has ever asserted itself and never has it been more dominantly potent than in the present, as witness the census reports of the rapidly increasing disparities in urban and suburban life. With these increasing differences, grows apace the necessity for greater public health administrative and regulative control. This, conspicuously, is one of the legitimate and essential functions of government. Man's individual impotency and the community welfare are alike, dependent upon it. Great as have been the results accomplished in Wisconsin in public health advancement, many inadequacies remain. These, it has been the effort of this division, in this, the second district, to lessen and eradicate.

A specific enumeration of some of the more serious obstacles to efficient service and advancement shows the inadequate coördination of the almost entirely independent township, village and city health boards; the selection in a large number of the health units of the district, of laymen without either adequate information or discretional capacity, as health officers; the generally speaking inadequate compensation for services exacted of all health officers; the relatively petty differences of private interest as between physicians not health officers and those who are; the petty differences of private interest as between physicians; the neglect, apathy and, at times, criminal indifference of many health officers; the reproach,

on the part of the public, oftentimes heaped upon efficient health officers for performance of duty and compliance with public health exactions; the deliberate and scheming resistance to and evasion of quarantine on the part of the ignorant, the morally irresponsible and the community health libertine. For assistance in the remedy of these and numerous other administrative defects and errors, the intermediate jurisdiction of the Deputy State Health Officer has been invoked, and this, my first report as such, for the period extending from October 1, 1913, to June 30, 1914, is respectfully submitted. Much of the work in the district is highly detail in character, a resume of which cannot be presented in tangible form. Sufficient it is to relate that persistent and assiduous effort has been made to stimulate and promote public health functions.

More specifically, it may be said that considerable effort has been expended to coördinate the work of the local health officers. Too often, it is appreciated by them that their administrative obligation has a limitation coextensive only, with jurisdiction boundaries, an attitude frequently fatal to effective service. In the multiplicity of agencies now available for rapid transportation, such interpretation has no place in a scheme of efficiency in public health service. The inadequately restrained Scarlet Fever, Smallpox or other communicable disease of the township, today, under such interpretation may be and frequently is the focus of an epidemic in poorly guarded areas, or the necessity for increased preventative activities in the metropolis, tomorrow. To inculcate and induce a keener appreciation of these facts, to minimize and eliminate the inevitable blighting effects of a false sense of isolation of service with an energizing, coördinating appreciation and activity, no opportunity has failed of utilization when in personal contact with local health unit control.

Other functions of the Deputy Health Officer in which service has been rendered, pertain to the investigation and abatement of nuisances, and all other disease generating agencies. Of these, there is a multiplicity. In magnitude they vary from the unsanitary privy of the most isolated rural home and summer camping party to the wholesale pollution of water supplies of well, river and lake of the most congested areas of population in the state, not exempting, in any degree, cities of the first class.

A concrete instance of the type of work carried on, in this connection, may be submitted. For several years the Kinnickinnic river in the county of Milwaukee, by reason of its polluted character, has been a prolific source of complaint and a continued menace to the general welfare and health of the public. Nor can an unfair imputation or charge be affirmed when I state that considerable illness has its origin here. With an added field complement and laboratory equipment, an investigation was begun, looking to the ultimate purification of its waters. The work was undertaken in the spring and pursued from time to time as expeditiously as necessary

attention to other urgent work would permit. A careful preliminary survey of the river and its basin extending from the city of Cudahy on the east, to the city of West Allis on the west, was made. The purpose of this was to ascertain at just what points in its course and by whom, prior to its flow through Milwaukee to Lake Michigan, contributions of unstable and deleterious wastes were being made. The Kinnickinnic in its entirety, is of relatively small size. It has its origin and outlet wholly within the county of Milwaukee, territorially one of the smallest in the state, yet densely populated. It has two branches, a southeastern and northwestern, which unite at a point one-half mile south and west from the southern corporation limits of the city. It has an aggregate length of about ten miles. Its volume is of two kinds, natural and artificial; its natural volume, except in flood time, is very limited and, in the drier seasons, is practically nil in more than half of its course; its artificial volume, in the northwest branch, except in freshet time, constitutes its main volume the year around and, in dry weather, its only volume. This year-around volume represents the effluent of the municipal sewage disposal plant of the city of West Allis and the contributions of industrial wastes from a large number of manufacturing plants of a diversified size and type, in all, aggregating approximately 1,500,000 gallons daily. It is this fact, coupled with the little, and at certain seasons of the year, no natural oxydizing dilutions that gives origin to the putrescent condition, the offensive odors and the highly toxic composition of the waters of the river. On, or adjacent to the banks of a stream of this character, extending from 51st avenue in the city of West Allis to Lake Michigan is a population of approximately 75,000 people. That such unsanitary conditions cannot be too hastily altered is plainly evident. To this end, numerous tests of samples of water have been made in the field and the Laboratory of Hygiene at Madison. These will be reported elsewhere. Too, after much delay incident to difficulties of construction, added septic tanks and filtration beds of ample capacity were completed by the city of West Allis, so that the municipality now has an equipment, at its eastern plant, of 175,000 gallons per twenty-four hours in excess of its present needs, resulting doubtless in a complete abatement of the most offensive and serious pollution of the stream. Chemical and bacteriological water analyses to establish such possible fact, have as yet not been made. However, no early or opportune time will fail of utilization.

Other less serious pollutions in this branch of the stream are from the Pressed Steel Tank Company of West Allis, the large malting companies of D. Weschler & Sons, Kurth Bros., interstate and various lesser concerns of varied type. Of these, the Pressed Steel Tank Company has under way, at the instance of this department, a settling tank treatment process for the removal of excessive quantities of suspended matter and large quantities of supernatant oil. As the fruit of action of, as yet, partial equipment, a very improved con-

dition of the stream at this point has taken place. Further alterations will be made. At the malting companies, samples have been taken but no treatment systems devised. The work is in process. The several effluents are of a large and serious character and call for remedy.

With the completion of this investigation and work, the Kinnickinnic river, in all of its suburban and a large portion of its urban course, will doubtless attain to stable condition, and with necessary supervision so remain until absorbed, as contemplated, in the larger sewage disposal enterprise of Milwaukee now in process of development, which comprehends not only this basin, but that of the Milwaukee and Menomonee rivers with an adequacy equal to the population and industrial developments for a period of thirty-five years hence, or to 1950.

Exposition of the work done, as may be set forth in statistical phases, with brief comment, is made in the following tables:

BIRTHS AND DEATHS.

Six counties in the district have exceeded the average birth rate of 22.5 per thousand of population, being Calumet, Kenosha, Racine, Milwaukee, Manitowoc and Sheboygan. That of Kenosha is noticeably large, being about double that of either Walworth or Waukesha.

The average death rate of 11.5 per thousand of population was exceeded in seven counties, Fond du Lac, Jefferson, Milwaukee, Rock, Sheboygan, Walworth and Waukesha.

TABLE SHOWING THE TOTAL NUMBER OF GENERAL AND SPECIAL SANITARY SURVEYS AND CLASSIFICATION OF SAME.

No.	Classification.
35	General sanitary surveys of municipal health units.
38	General sanitary surveys of slaughterhouses.
2	Special sanitary surveys of slaughterhouses.
31	Special sanitary surveys of toilets and nuisances.
4	Special sanitary surveys of rendering plants.
6	Special sanitary surveys of stream pollution.
2	Special sanitary surveys of scarlet fever.
11	Special sanitary surveys of smallpox.
1	Special sanitary survey of typhoid fever.
2	Special sanitary surveys of schools.
2	Special sanitary surveys of stockyards.
134	Total.

TABLE SHOWING RESULTS OF SURVEYS, GENERAL AND SPECIAL.

No.	Nuisances upon which orders directing care, and to abate, were issued.
1	To abandon use of old well as cesspool.
5	To abandon use of improperly located cesspools.
6	Over-full cesspools.
3	Neglected septic tanks.
23	Unsanitary toilets on both private and public property.
26	Garbage and waste piles.
10	Creamery wastes.
4	Stream pollutions.
21	Slaughterhouses.
2	Rendering plants.
101	Total.

TABLE SHOWING THE LOCATION OF GENERAL SANITARY SURVEYS BY COUNTIES AND DISTRICTS.

County.	District.
Milwaukee	Franklin. Granville. Greenfield. Lake. Milwaukee. Oak Creek. South Milwaukee. Cudahy. West Allis. Whitefish Bay. East Milwaukee. North Milwaukee. New Butler.
Ozaukee	Cedarburg. Grafton. Mequon. Saukville. Thiensville.
Racine	Burlington. Caledonia. Dover. Mt. Pleasant. Norway. Rochester. Waterford. Corliss. Raymond. Union Grove.
Kenosha	Randall. Salem. Wheatland. Paris. Brighton.
Jefferson	Koshkonong. Jefferson.

TABLE SHOWING LOCATION AND TYPE OF SPECIAL SURVEYS FOR COMMUNICABLE DISEASES.

Location.	Disease.
Fond du Lac	Typhoid fever.
Hilbert	Scarlet fever.
Brillion	Scarlet fever.
Caledonia	Smallpox.
Racine	Smallpox.
Kenosha	Smallpox.
Ft. Atkinson	Smallpox.
Hartland	Smallpox.
Oconomowoc	Smallpox.
Lebanon	Smallpox.
Ashippun	Smallpox.
Ixonia	Smallpox.
East Troy	Smallpox.
Grafton	Smallpox.

REPORT

BY DR. L. E. SPENCER, WAUSAU, WISCONSIN, DEPUTY STATE HEALTH OFFICER, THIRD DISTRICT.

Herewith I submit my first report covering the period from October 1, 1913, to July 1, 1914, a period of nine months. This, the third sanitary district, is composed of the counties of Brown, Door, Green Lake, Kewaunee, Langlade, Lincoln, Marathon, Outagamie, Portage, Shawano, Waupaca, Waushara, Winnebago, and Wood, and has a population of 452,562, as per census of 1910. Twenty-four cities and fifty-nine villages are located in this district.

During the period covered by this report (from October 1, 1913, to July 1, 1914,) the following communicable diseases have been reported from this district by local health officers to the State Board of Health:

Diphtheria, 314 cases, with 32 deaths.
Typhoid, 61 cases, with 9 deaths.
Whooping Cough, 298 cases, with 5 deaths.
Smallpox, 406 cases, with 1 death.
Scarlet Fever, 297 cases, with 10 deaths.
Measles, 893 cases, with 3 deaths.
Tuberculosis, 109 cases, with 34 deaths.
Meningitis, 12 cases, with 7 deaths.

The number of cases reported of diphtheria, typhoid, scarlet fever, and meningitis are probably nearly correct, but in epidemics of measles, whooping cough, and smallpox the writer is of the opinion that a greater percentage of the cases are never reported. This is sometimes the fault of the health officer, but in many epidemics the larger percentage of cases are never seen by a physician and the parents do not notify the health authorities for fear of some inconvenience to which they may be subjected on account of quarantine or placarding.

The advisability of quarantine is a debatable question as regards measles and whooping cough. There is no argument as to the seriousness of these diseases and the complications which arise, but I doubt whether anything would be gained in making them quarantinable. As it is, only a percentage of the cases are reported, and the question arises, would not the parents hesitate even more than under the present regulations in calling a physician on account of fear of quarantine, if such were the ruling of the health department?

Smallpox is diagnosed and quarantine well maintained in the cities and villages, but in the country districts the disease often runs undiscovered by the local authorities for some time. In mild cases it is diagnosed by laymen, and occasionally by a physician, as Cuban itch, chicken pox, impetigo-contagiosa, etc. Smallpox in a mild form is almost continuously present in this district, and probably will be for

years to come unless we have more general vaccination, as it has been thoroughly demonstrated time and again that quarantine alone will not stamp it out.

In tuberculosis there were 109 cases reported, and 34 deaths. This high death rate probably is only apparent as no doubt many incipient cases were not reported at all,—sometimes on account of the inability of the attending physician to make a diagnosis, while other cases were not reported on account of the carelessness of the physician.

While there were 61 cases of typhoid in this district, there was no epidemic at any time, nearly all being sporadic cases. There was no outbreak from any water or milk supply, and the cases were widely scattered. Some were imported from other communities where conditions for contracting the infection were more favorable, and the remainder were probably food infections, contact and fly infections. Thirteen is the greatest number of cases reported from any one county, and in the counties of Kewaunee, Shawano, and Waupaca no cases were reported, and the writer is not aware that any cases have existed unreported in these counties. Continued education of the public as to the means of preventing typhoid will lessen this disease of filth from year to year.

In diphtheria, the 314 cases of the disease with 32 deaths in the district for a period of nine months, is an unsatisfactory showing. Earlier diagnosis, more prompt use of the State Laboratory, and the liberal use of antitoxin early in all suspected cases ought to greatly reduce the number of cases and cut the death rate materially. I have repeatedly been called to investigate outbreaks of this disease in the last year where more prompt diagnosis and the liberal use of antitoxin would have saved lives. Physicians should use the State Laboratory in all suspicious cases of sore throat, and not put their trust in clinical appearances.

The 297 cases of scarlet fever were widely scattered, there being no important epidemic of the disease. The mild type prevailing is shown by the low death rate. It is very difficult for the health authorities to stamp out this disease when a mild type prevails, as there are so many cases the physician never sees, and consequently not reported to the health department.

The question of quarantine is a very important one. It should be made as simple and inexpensive as possible for the householder; otherwise in all mild types of communicable diseases the people will try to cover up the cases, they are not reported, proper fumigation of the premises never takes place after recovery of the patient, the children return to school, and new cases arise. We must have the coöperation of the people and make quarantine as little burdensome as possible, in order to prevent the spread of communicable diseases.

Assistant-Surgeon General Trask, in Public Health Reports says: "At the present time one of the greatest handicaps to rational and

effective health administration is the lack of knowledge of public health work and of the control of disease on the part of many local health officials, and especially those of small cities, villages and rural communities. This lack of knowledge is in most instances not due to unusual ignorance but rather to the fact that there are exceedingly few men with requisite training from among whom the thousands of local health officers can be appointed."

This corresponds with my observations. Most of the health officers in the townships are laymen, and have no conception of their duties and assume no responsibility in looking out for the welfare of the community, from a public health standpoint. They are rarely paid any salary, and many of them take no interest in the work. I can recall in more than one instance where the health officer of the town was not aware of his appointment, the town officers having organized as a board of health and appointed a health officer according to law, but considered the office of so little importance that later the minutes of the meeting had to be referred to to see who was the legal health officer of the town.

Much is being accomplished with the public health conferences, in interesting and instructing these country health officers. The deputy state health officers also are now able to coöperate with, assist, and instruct these men to a considerable extent. However, the fact remains in many townships no thought is given as to ability and training for the position of local health officer. It is given to some person who is willing to accept it, and at times the office goes begging. Until such time as local communities will be willing to pay reasonable salary for a competent person to act as health officer, and demand service and can see that it pays to do so, can we hope to expect much efficiency in the administration of public health matters in rural communities, especially in the control of quarantinable diseases?

In the cities and in many of the villages of this district, the health officers (mostly physicians) are as a rule doing excellent work,—in many instances for a salary not one-half or one-third what it should be considering the work accomplished. Sometimes it is rather discouraging; for instance when the local health officer is working hard in general health work and to restrict the spread of contagious disease, and cannot get the support of the council in matters where a small expenditure of money is called for. I have in mind now one of the largest cities in this district where the city council refused the expense bill of the health officer for his trip to the biennial health conference in Madison. I believe, however, that there is a growing tendency among well-informed people to be more liberal in the support of public health activities, feeling it pays in the long run; and if this is true, no doubt more thought will be given in the future in selecting health officers and in fixing salaries commensurate with the work which is required.

There are no full time health officers in this district, but the city of Oshkosh is considering the advisability of adopting this plan.

Oshkosh has a well-equipped laboratory and does practically the same class of work as is done at the State Hygienic Laboratory. It is a great aid to the physicians of that city, as well as a valuable adjunct to the health department.

The writer has visited all the cities, some of them many times, during the last year, making general and special inspections. Have also visited nearly all of the fifty-nine villages, and many of the townships, in making sanitary surveys and special investigations.

WATER SUPPLY AND SEWERAGE SYSTEMS.

Twenty-two cities in this district have public water supplies. Two cities, Oshkosh and Sturgeon Bay, are supplied by Lake Winnebago and Sturgeon Bay, respectively. The water at Oshkosh is filtered and treated, while at Sturgeon Bay the supply is intended only for fire protection and no attempt is made to treat so as to make it fit for domestic use. Merrill is supplied from Prairie river, Appleton from Fox river, and Stevens Point from Wisconsin river. Merrill and Appleton filter and treat their supplies, while Stevens Point makes no attempt to filter, but treats with hypochlorite.

The other cities in this district have drive and dug wells for their supplies, and treatment is not considered necessary.

The importance of a safe and abundant public water supply is recognized more and more each year by the public, and many communities are agitating for the establishment of a system or for some improvement of their present one. Samples of all the public water supplies are examined frequently, and the local authorities in this territory are earnestly striving to furnish an adequate supply of good safe water. However, there are several supplies in this district which are far from being satisfactory, and while the local authorities are fully cognizant of the fact, they find it impossible (for financial reasons) to make the improvements necesssary.

There are many villages in this district large and important enough for water and sewer systems, but very few have them. The writer has in mind two villages where the installation of a sewer on the main street is the only solution of a bad drainage problem. Of course water mains should be laid at the same time. These communities recognize the need of these public improvements, but feel they cannot bear the tax burden imposed in installing same.

POLLUTION OF STREAMS.

Very little has been accomplished so far in diminishing the pollution of streams in this part of the state. Most all of the cities and many of the villages are located on important rivers, like the Wisconsin, Fox, and Wolf, and their branches; and on the shores of Lake Winnebago and Lake Michigan. Disposal plants are in operation in the inland cities, like Marshfield and Antigo, but the sewage in all the cites along the main water courses and lakes goes into

these bodies of water untreated. An immense volume of manufacturers' waste is also discharged into these public waterways, especially from the paper mills.

In cities fortunate enough to have other sources for a good water supply, this pollution of public waters is not at present a matter of great importance. However the question of stream pollution in this state is a big problem, and the beginning of its solution must be attempted in the near future.

SLAUGHTERHOUSES.

There are about 150 slaughterhouses in this district. Included in this enumeration are many places hardly worthy of the name, many of them being only small frame structures built of rough lumber and without any conveniences, where slaughtering is done during only a few months in the year, and on a very small scale, the market men in many instances purchasing most of their products from packers. Of the above, I have personally inspected seventy-five places, which included all those located contiguous to the larger cities. Twenty places were condemned, twenty-nine passed inspection under the new law regulating slaughterhouses, and in twenty-six the owners were given to understand that better buildings and equipment would have to be provided within a reasonable time.

I have tried to treat the butchers fairly in the interpretation of these new rules, and have given them to understand that the sole object is to secure the maintenance of cleanliness in the operation of these places, and that where a real effort was being made in this direction it would weigh heavily in favor of the butchers who are not equipped with all the conveniences called for in the regulations. I have personally visited practically every butcher in this district, and have delivered to him a copy of the rules and regulations of the State Board of Health, and have requested that they be read carefully. I believe a great improvement has already been made along this line. The feeding of raw offal has practically ceased since these rules were put into effect.

In the larger communities where there are several slaughterhouses in use, I have asked the butchers to consider the advisability of building one modern, well-equipped place for the joint use of all. This would be good business policy, as the individual investment would be small, and the offal (which often creates a nuisance, and is an expense to dispose of in a small establishment) might be made an asset in a plant where considerable killing would be done.

CAMP SANITATION.

The writer has been invited to speak on this subject to the members of the Northern Hemlock & Hardwood Manufacturers' Association at two of their regular meetings within the last year. The new regulations adopted by the State Board of Health governing lumber and other industrial camps were gone over and interpreted, and a free discussion followed. The State Board was assured of the

earnest coöperation of this representative body of lumbermen in carrying out the provisions of same. There are only three counties in this district (Lincoln, Langlade and Marathon,) where any logging operations of any pretensions are carried on. Many of these camps I visited over a year ago, in company with Mr. Leiserson of the Industrial Commission, and I shall endeavor to see every camp of any importance in this district during the coming winter.

I consider the general health and sanitary conditions as a whole very satisfactory in this district. However, a much better showing could be made in the future if the authorities would pay a reasonable salary to their local health officers, select the men best fitted for the position, demand good service in return, and keep good men in office as long as their work is satifactory.

The larger cities, I should say those of 10,000 population and over, should encourage the establishment of laboratories in connection with the health department. The local health officer, if he is interested in his work, is willing in most instances to spend the time and money to learn the technique for the more ordinary work (if he is not already familiar with same), providing the city will furnish the equipment and bear the nominal expense of the laboratory.

The State Laboratory is doing more and more of this work each year, but there are physicians in every community who would take advantage of a local laboratory much more often than where it is necessary to send in specimens and wait for a reply by mail.

REPORT

BY DR. FRED JOHNSON, EAU CLAIRE, WISCONSIN, DEPUTY STATE HEALTH OFFICER, FOURTH DISTRICT.

This report covers the period from November 1, 1913, to July 1, 1914. District No. 4 includes the following counties: LaCrosse, Monroe, Jackson, Trempealeau, Buffalo, Pepin, Eau Claire, Clark, Chippewa, Dunn, Pierce, St. Croix, Polk, Barron, Rusk, Sawyer, Washburn and Burnett.

The southern half of the district is well settled country and has different health problems to solve than the northern half which is only sparsely inhabited. There is a higher death rate in the southern counties owing, no doubt, to the fact that there is a larger urban population.

The only infectious disease which seems to be well reported is typhoid fever. The eruptive, communicable diseases have appeared in such mild form that they have frequently not been under medical observation and so have escaped the notice of the local authorities.

In the southern counties there is a larger proportion of deaths occuring in people over sixty-five years, which can be accounted for by the fact that the younger people have settled in the northern districts, leaving the old people to remain at home in the neighborhoods to which they came one or two generations ago.

The rate of mortality in Barron county is somewhat higher than in 1912 and there is also a slight falling off in the birth rate. The large number of cases of diphtheria is due to medical carelessness or ignorance, several deaths having occured before the disease was recognized. Tuberculosis is well reported in the county.

There is a slight decrease in the death rate in Buffalo county. There were very few cases of infectious disease and no epidemics during the past year.

Burnett county has a high death rate which can be accounted for by the fact that the western part of the county has been settled for forty years and a large proportion of the deaths were in people over sixty years of age. The doctors are careless in reporting tuberculosis. A number of cases of typhoid fever were due to infection by a carrier.

Chippewa county has rather a high mortality rate—11.9, which, however, is about the same as in 1912. Forty-eight deaths among children under one year indicates that instruction in the care and feeding of infants ought to bear fruit. Thirty-five deaths from tuberculosis seems a rather high rate. Scarlet fever was prevalent but the mortality rate was low.

The general death rate in Clark county is lower than the average. The infant mortality was high and there were as many deaths from pneumonia as from tuberculosis.

Dunn county has a low mortality rate. Pneumonia led in the list of causes of death in this county. Scarlet fever and smallpox were quite prevalent in the rural districts, but they were in mild form and the tendency to conceal the fact so that they would not be bothered with quarantine was evident.

Eau Claire county has a comparatively high death rate of over 11 per thousand. The infant mortality was high, fifty-four in nine months and forty-two deaths from pneumonia. Tuberculosis is on the decline and there were very few cases of the eruptive, communicable diseases.

Jackson county has a mortality rate of 10 and a birth rate of 19.3. Cancer follows tuberculosis very closely as a cause of death. The only prevalent, contagious disease in the northern towns last winter was smallpox.

La Crosse county has a high mortality rate of 12.9 and a birth rate of 20.9. The infant mortality rate is high. The health department of the city of La Crosse, although efficient, meets with considerable opposition in trying to improve the milk supply. There was one epidemic of diphtheria during the year, but it was well managed by the local health authorities.

In Monroe county, pneumonia, tuberculosis and cancer head the list in the order named. In one city in the county diphtheria has been present in a mild form for about one year. The local authorities do not think it of sufficient importance to have the school children examined. Smallpox has been prevalent in the rural districts and is rather hard to control.

Pepin county has a mortality rate of 11 and a birth rate of 20. Scarlet fever and measles were prevalent during the spring months.

Pierce county has a mortality rate of 10 and a birth rate of 17. The infant mortality rate is low. Although smallpox and scarlet fever prevailed to some extent, no deaths were reported.

Polk county has a death rate of 9.2 and a birth rate of 25. As usual, pneumonia, cancer and tuberculosis lead as causes of mortality. Sporadic cases of smallpox and scarlet fever were reported.

In Rusk county the birth rate was 27, the highest in the district. The infant mortality was rather high, but this is due, I believe, to the high birth rate.

St. Croix county has a low birth rate of 19 with an average infant mortality. Pneumonia and tuberculosis cause the most deaths. Scarlet fever and measles were quite prevalent but unreported, owing to the disease appearing in a mild form.

Sawyer county has a death rate of 10 and a birth rate of 18.4. In this county it is hard to get statistics from the Indians, where tuberculosis is very prevalent. Many of them live off the reservations and in most unhygienic surroundings. There were few cases of communicable disease.

Trempealeau county has a mortality rate of 10 and a birth rate of 23 per thousand. Pneumonia and tuberculosis lead the list as usual. The diphtheria cases were all in the southern part of the county, and were a part of the same epidemic which prevailed in La Crosse. The smallpox epidemic was in the northern part of the county and it was controlled with some difficulty. No deaths from smallpox were reported.

Washburn county has a low mortality rate but a high birth rate. The infant mortality is rather high, and pneumonia and tuberculosis lead in the causes of death. One death from diphtheria occurred in this county.

I have made in all eighty-five sanitary surveys and have visited nearly all the cities and villages of over 500 population. I find that the sanitary conditions in the small villages are not so good as in the larger towns. There are, in my opinion, more children with physical defects in the small places than in the better governed cities, where there is medical inspection of school children.

The local boards of health are, as a rule, well organized and do more work than they get compensation for. Where a city of 4,000 people pays its health officer $125 per year, they cannot expect much in return. If the local health officer is a physician, he does not get compensation enough to make it worth while to neglect his prac-

tice. We must impress on the people that if they want the public health looked after properly, they must give adequate compensation for the work done. In the cities which have a commission form of government there is usually a better health administration. This is due to the fact that usually a member of the commission acts as health officer.

The newest city in my district is not only the cleanest, but they are making intelligent and foresighted plans to keep the sanitary conditions of the city up to a high standard. The health officer is efficient and quarantine regulations are strictly enforced. The only infectious disease in the town is tuberculosis.

In contrast with this, I will refer to an old river town of 10,000 population. They have a few private sewers running into the river, but most of the population is served by overflowing privy vaults. The public school buildings are all old insanitary fire traps, the citizens believing that what was good enough for them will do for their children.

I found ideal conditions in a village only two years old. They have a good sewer system with water works, and there is much interest in health matters.

In contrast to this, I found an old village in a well-settled region where business is so flourishing that they can support two large banks. The streets are unpaved, the alleys are full of manure piles and garbage is thrown anywhere. The schools are overcrowded and, judging from the appearance of many of the inhabitants, personal cleanliness is not generally practiced. Typhoid fever is quite common and the communicable diseases are spread more easily every year.

Where the people are cleanly and wide-awake in sanitary matters there is much less in the way of infectious disease and the health officer finds little to criticize. Some health officers in the county seem to be guided wholly by the sense of smell, and if they have no public nuisance in their district, they flatter themselves that everything is as it should be.

I have made seventeen inspections on account of outbreaks of communicable diseases. I found the most trouble with scarlet fever when it appeared in a very mild form. A careful inspection would always reveal the fact that some cases were attending school and the only remedy for this condition is to have a daily inspection of the schools by a competent medical man. In the country district, cases are not reported because quarantine means a cutting off of the revenue of the dairyman who furnishes the supply of milk. In one neighborhood, by dint of persuasion, letters and threats, I succeeded in stamping out the epidemic. This condition, however, is typical of many farming communities.

I had an interesting and valuable experience in one county with a typhoid carrier. In a community in the northern part of the state typhoid fever prevailed for four years and a number of water ex-

aminations had been made with negative results. On inquiry, I found that these families in which typhoid had occurred had visited a certain farmhouse where the head of the family had suffered from typhoid five years ago. He had been sick away from home and after his recovery and return to his family others in the home had contracted the disease. Then those in the neighborhood developed the same ailment until twenty-two cases had been reported. Examination of his excreta showed typhoid bacilli in his urine. He was forbidden to milk, handle milk, or any milk utensils, and his discharges were all disinfected. Since then no new cases have developed in that neighborhood.

I observed another epidemic of typhoid fever the result of contact infection where there were fifteen cases and one death.

The eruptive, communicable diseases are a great source of public danger where the members of the medical profession, either through ignorance, carelessness or for other reasons fail to make known or report their diagnosis. Quite a large number of medical men refuse to make a diagnosis of an infectious disease where it will cause trouble, inconvenience or financial loss to their clients. I have insisted in the differential diagnosis between varicella and smallpox that the absence of prodroma is the crucial test for chickenpox. In severe cases of communicable disease there is usually not much difficulty in enforcing quarantine, but in mild cases it is quite another thing, as the people cannot see why they should be quarantined when they were not sick.

I have made seventeen special investigations on complaints of nuisances. One of the popular complaints in small villages is the condition of the stockyards. I have ordered cement floors in most cases with instructions for frequent flushings, which generally abates the nuisance complained of. I have investigated a hundred slaughterhouses and only found two that were fit places to prepare food for human consumption. The worst one that I found was eight miles from the corporate limits of a town and when not used as a slaughterhouse, served as a roost for chickens. The floor was originally of boards, but there was so much dirt on it that you could not find it without digging. The pigpen joined the slaughterhouse where a great deal of meat was prepared for sale. In such cases, I have insisted on cement floors, screen doors and windows, the sanitary disposal of offal, and a general cleaning up of the interior of the slaughterhouse. In the larger places I have encouraged the butchers to get together and have a central abattoir built, preferably a municipal one. In one city arrangements are being made for a central abattoir to take the place of seven unsanitary places. Those who protest the loudest against the expense of making sanitary improvements are generally the ones to rebuild first.

As to vital statistics, I found in my general survey that the health officials are not to blame for imperfect reports. The doctors are usually the delinquents in this respect; they sometimes delay their

reports until the end of the month and then forget to fill them out and mail them to the local registrars. I have notified a number of them, but I think that a few convictions and fines will be much more effective in some cases. Nearly all of the cities and villages obtain their water supply from wells. There are few exceptions. One city of 5,000 gets its supply from a small lake and another of 5,000 uses river water. There are some that use well water for ordinary purposes but have connection with the river in case of fire.

On the subject of proper sewage disposal, although somewhat careless, we are in advance of most other states according to a recent report. The largest city in this district without a public sewer is one with 1,900 inhabitants. I have found only seven towns of over 1,000 population without a public sewer system and in three of these, owing to the character of the soil, it would be a very expensive proposition. In villages of from 500 to 1,000 population there are nine that have a public sewer and several others are planning to make this improvement as soon as their finances will permit. Nearly all of the cities and villages use, without purification, the natural waterways for their sewage disposal. This should not be permitted. In a town of 1,900 inhabitants, which has no public sewage disposal, there are a number of small private sewers at all levels emptying into a small river which cannot take care of more sewage so that this town must have a septic tank and filtration plant in the near future.

In contrast to the above there is a village only two years old that has installed a public sewer and made preparation for all future needs.

Another place which grew from 75 to 3,000 population in fourteen years has had a great deal of trouble and extra expense because they did not plan for the future and soon outgrew the sewer system.

The rivers in this district are, no doubt, to some extent becoming polluted by the discharges of sewage, but, as the water is not used for drinking purposes, there is no complaint so far about pollution.

I have given several informal talks to medical societies on more efficient reporting of contagious diseases including tuberculosis, but the worst offenders do not attend medical meetings, so I make it a point to call on every doctor in the town where I make my survey and by personal contact try to impress on them what their duty is in this respect. I have prepared three papers for different medical societies, when I had a subject that I wanted to present, and was only received with discourtesy in one instance. The greatest trouble, I believe, with the reporting of tuberculosis is that these cases wander about from one doctor to another and the last man thinks that the other fellow has reported it. Some men are so depraved as to conceal from the patient or his friends that he has tuberculosis so that they can continue treating the patient.

Another hindrance in the collection of cases of dangerous, com-

municable disease is the frequent changing of health officers. A doctor who is treating a case in an adjoining town often does not know the name or post-office address of the new health officer and so the case is unreported. A few convictions, however, for not reporting would convince the doctors that they had better comply with the law.

The value and need of deputy state health officers is illustrated by the case of the typhoid carrier which I have alluded to; at the laboratory they were suspicious of a carrier from the history of the spread of the infection in one neighborhood. If a field man had been appointed a year before, he might have prevented the spread of the infection that much sooner and thus have prevented much unnecessary illness and several deaths.

The rural communities have not received the consideration that their importance demands. A complete survey of every county should be made so as to obtain positive data on local health conditions; then the local authorities will be willing to listen to our suggestions and carry them into effect. By this survey, I mean a canvass of every home and business place, get the medical history of every family and examine every suspicious case for tuberculosis. This work should be done with the assistance of the local health officer in each district. The visiting nurses can be of great help in a survey of this kind and their assistance should be obtained in all cases. The work that has been done is superficial, but it has been of great value in stimulating interest in health problems throughout the state.

REPORT

BY DR. W. C. BENNETT, RHINELANDER, WIS., DEPUTY STATE HEALTH OFFICER, FIFTH DISTRICT.

This district comprises the counties of Ashland, Bayfield, Douglas, Florence, Forest, Iron, Marinette, Oconto, Oneida, Price, Taylor and Vilas.

The number of inspections covers a period of eight months, from Nov. 1st, 1913, to June 30th, 1914.

The character of work done is indicated, as follows:

General inspections	24	Hotels	2
Creameries	3	Tuberculosis	5
Stock yards	1	Diphtheria	1
Pickle factory	1	Schools	2
Smallpox	8	Ice	1
Vital statistics	2	Typhoid	3
Rabies	2		
Water supplies	24	Total	127
Sewers	19		
Lumber camps	6	Number towns visited	48
Dumping grounds	4	Number visits	69
Trichinosis	1	Number hospitals visited	52
Slaughterhouses	18	Number municipal units inspected	66

During the year 48 towns were visited, some of them a number of times. Except in cases where haste was necessary, a general survey of the health conditions, existing at the time, was made. Inasmuch as the district was entirely new and many conditions existing in this part of the state totally unfamiliar, the work was at first not carried on with the facility which later became possible. There are a number of conditions not observed in the north, which need to be carefully watched in the southern part of the state, and the converse is also true. The almost total absence of intestinal diseases, even in the large cities, is a thing that requires time to appreciate. There is apparently a much lessened tendency toward decomposition of organic matter, than exists in the south. This is evident in the absence of nuisances under conditions which would inevitably produce them further south. On the other hand, the lumber camps are ideal places as they are often conducted, for the breeding of such diseases as typhoid fever and smallpox, and the difficulty of visiting the camps, makes a widespread epidemic very difficult to manage.

Some camps are connected with each other by obscure trails in a way that is readily conducive to the spreading of communicable diseases, and prevents to a great extent the tracing of the paths of travel of the disease. When this cannot be done, the work of suppressing an epidemic is tremendously complicated and uncertain.

The local boards of health have invariably done all that they could to assist us in lessening disease where epidemics actually existed, but there is a strong tendency toward a false economy in the matter of warding off future trouble. This is seen in the small and often ridiculous appropriations made for health work in the cities, and the meager stipend paid to health officers everywhere. It is a matter deserving of great praise that the men engaged in this work will do so much work, often of a very disagreeable nature, and with almost no compensation except the curses or threats of their fellow townsmen, whom they are trying to aid. It is true that many health officers do not exert themselves particularly, except in the face of an epidemic, but when the obvious necessity arises, they are found ready to do their duty to the utmost.

Some health officers scorn the salary and do most efficient work merely for the good of the cause. One, in particular, has fought several epidemics, importuned local authorities to secure sanitary schools, public buildings, clean streets, alleys and yards, inspected depots, factories and, in short, every place that might require looking after, to bring his town up to a maximum of healthfulness. Two years of gruelling work of this sort has had the effect of showing thinking people the value of the efforts made, and though many growlers are yet in evidence, they are becoming perceptibly less and words of appreciation are becoming correspondingly more frequent. It is to be hoped that the authorities will recognize the worth of his labors in a more substantial manner.

In general, however, it may be said that active health work, will not be done, unless the remuneration is more nearly proportionate to the effort expended.

In the townships containing no villages, there are many health officers who hold the position from year to year without doing a single thing in the way of health work. As no salary is paid, it is considered to be a very satisfactory arrangement. With so much to be done, it seems a pity that all this time is wasted, and if the health officers were educated even to a slight extent along the lines of public health work a great deal might be done to improve the insanitary conditions which are prevalent.

In the eight months covered by the report, twenty inspections were made on account of outbreaks of communicable diseases.

The matter of public dumping grounds is deserving of some mention. Villages and small cities are peculiarly careless about the location and care of dumping grounds. Very often they are almost in the heart of the town, it evidently being considered that convenience in reaching the grounds is the primary object in locating them. Then, again, the materials dumped are not sufficiently regulated. Decomposing organic matter is frequently thrown on the dump and allowed to lie uncovered and unmolested. People living in the vicinity become righteously indignant but are often laughed at by the local authorities for complaining.

One of two things must be done in these cases. Either the dumping grounds must be removed to a remote spot, where there are no dwellings near, or the local authorities must conduct the dump in such a way that it will not annoy those living in the neighborhood. Frequent burning of combustible material or burying of such material as will not burn is imperative.

The northern district is not very abundantly supplied with slaughterhouses and frequently a few suggestions in the way of making repairs is sufficient to drive those already established out of business. Owners seem to prefer to import meats rather than to go to any expense in providing sanitary abbatoirs. At most slaughterhouses the feeding of offal just outside of the building is practiced and instructions are given to comply with the law. It is also demanded that slaughterhouses be kept properly clean, that screens be provided, and uncontaminated water used. Also that the ground surrounding the building be kept in proper condition.

Two physicians were prosecuted for failing to report births according to law. It is expected that physicians will report these properly, although it is sometimes an inconvenience to do so. Very often the inheritance of property is determined by the presence or absence of a birth certificate, and while the fee provided may be very small for the amount of trouble involved in securing the data in some cases, in general it is liberal enough, and physicians and others owe it to society to do this work. That there are other important reasons for securing the reports, adds to the weight of the argument.

The water supply of towns has been investigated particularly, because of the great importance attaching to a pure water for domestic purposes. Most places, both large and small, have good water supplies, but there are a few which do not. One large city pours its untreated sewage into its water supply and to this the wastes of several manufacturing plants are added. To counteract this, hypochlorite is used but the disagreeable taste produced by the combination is so marked that the inhabitants must frequently go without water or purchase spring water. Such a condition, from a sanitary standpoint, is inexcusable.

Another town secures its water from a sluggish stream, and at times, it is so loaded with algae, particularly uroglena, that the water is almost undrinkable. This water, naturally, is especially susceptible to inoculation with typhoid and other pathogenic organisms, and as a matter of fact, a small epidemic of typhoid was induced by it last winter. At this place the intake has been extended a short distance and the current is a little more rapid at its present location, but the change is only one of degree.

The subject of the reporting of tuberculosis has always been considered when conversing with local health officers. It does not seem to be so much a desire to shirk the duty, as a failure to understand just what is wanted that prevents a more general compliance with this law. If the Board would prepare a pamphlet, giving in detail what was wanted and how to go about it, there would undoubtedly be a much greater coöperation among the physicians. For the others, probably at the present time, not much can be expected.

One hears stories of typhoid epidemics and other epidemics involving hundreds of victims, but there are none of these now, and this must be attributed to the enforcement of known sanitary laws in recent years. In a way, it is a high tribute to sanitary science that people will not stand for conditions now that a few years ago they accepted without question.

The general health of the district has been reasonably good during the year, but it is hoped that the deaths of children under five years of age will be materially decreased in the present year. With almost no deaths from diarrhoeal diseases, the showing ought to be much better.

Being strongly of the belief that preventable physical defects in children are the cause of many deaths annually, either directly or indirectly, of school children; that they are the cause of most of the retardation occurring in the schools; that they are the cause of most of the early suspension of school work; that depending to a large extent on the latter fact, they are the cause of a vast amount of the expense consequent on the operation of governments, courts, charitable and penal institutions, it was deemed advisable to make a start toward correcting some of these defects as they existed in the rural schools.

To this end a blank was prepared and instructions as to how to

make simple tests for common defects, for use by the teachers. While not a great deal was expected of them, it was felt that whatever was accomplished would be a clear gain and that it would be a step in the direction of getting more efficient work done in the future. The result, however, was a very agreeable surprise, for the examinations were found to be much more complete and valuable than had been expected. It is established that the rural teachers can readily secure a knowledge of the gross defects of the children under her care. And if sufficient interest can be aroused, she will make recommendations for further examinations and treatment, which will be of vast benefit to the individual pupils and through them, to society.

That much interest was felt in the work by the teachers was evidenced by the fact that over one-tenth of the children examined were so recommended. A few of the results obtained may not prove uninteresting. 1,041 children were examined, 83 were designated "sickly," 301 had defective vision, 304 were troubled more or less with headaches, 33 had discharging ears, while 203 had defective hearing in one or both ears. One half had decayed teeth, 248 had nasal obstruction and 178 were mouth breathers. 158 were said to be nervous, and 119 were classed as "dull" or "stupid." A number of other interesting conditions were discovered, but the above will suffice to indicate what was done.

In addition to the discovery of gross physical defects and the subsequent reference of these cases to medical men, an effort is being made to encourage individual study of each pupil by the teacher, with the idea of adapting the work of the child to its peculiar needs and abilities. It has long been realized that the adapting of the child to the course of study is based on a wrong principle, but as yet no decided departure from this irrational method has been made. It is hoped that this work will cause an appreciation of the value of individual child study that will hasten the change in methods of teaching which is so sadly needed.

It is certain that a realization of the intimate connection between physical abnormality and mental inefficiency and even of moral obliquity, will result in beneficial changes sooner or later.

While it is not expected or desired that this method of school inspection shall take the place of inspections by medical men, where such a method is possible, it is believed that there are advantages in this method, in some respects, over the other. For instance, no school inspector can observe the child at its work and at play and under the various conditions that a teacher has, and there are many mental, moral and even physical properties brought out under these conditions that might escape the observation of the medical inspector entirely. It would seem that a combination of the two methods might be almost ideal. At any rate, in the absence of a regular inspector, this method has a great deal in its favor, and so far as observed, no drawbacks.

The following tables show in detail the results of the investigations made in the rural schools of Oneida county:

CONDITION OF SCHOOLS AND GROUNDS—ONEIDA COUNTY.

Number of schools having less than 200 cubic feet air space per pupil	3
Number of schools having approximately 200 cubic feet air space per pupil	3
Number of schools with deficient or badly arranged light	22
Number of schools not stated	4
Number of schools with closets not screened	9
Number of schools without pure water	14
Number of schools without sanitary tanks	3
Number of schools without proper ventilation	15
Number of schools heated with common stoves (not jacketed)	17

APPARENT RELATION BETWEEN DECAYED TEETH AND CERTAIN MORBID CONDITIONS.

	Number	Per cent
Total cases earache	*134	.....
With decayed teeth	99	73
Without decayed teeth	35	27
Total "tender nostrils"	138	.....
With decayed teeth	84	60
Without decayed teeth	54	40
Total "mouth breathers"	180	.....
With decayed teeth	124	60
Without decayed teeth	56	40
Total "goiter"	56	.....
With decayed teeth	36	64
Without decayed teeth	20	36

* Some cases classed as earache are likely toothache.

TABLE SHOWING CONDITION OF PUPILS IN ONEIDA COUNTY RURAL SCHOOLS.

	Number	Per cent
Total children reported	1,041	.....
Males	533	51.2
Females	508	48.8
Total under 8 years of age	224	21.5
Males	124	55.3
Females	100	44.7
Total 8 to 11 years, inclusive	457	43.9
Males	231	50.5
Females	226	49.5
Total 12 to 15 years, inclusice	312	30.0
Males	155	49.8
Females	157	50.2
Total 16 years and over	48	4.6
Males	23	47.9
Females	25	52.1
Total designated "sickly"	83	7.9
Males	40	.....
Females	43	.....
Total with abnormal skin (pale, yellow, etc.)	91	8.7
Males	41	.....
Females	50	.....

TABLE SHOWING CONDITION OF PUPILS IN ONEIDA COUNTY RURAL SCHOOLS—Continued.

	Number	Per cent
Total with eyes "inflamed, dull, swollen"	61	5.8
Males	36	.....
Females	25	.....
Total "eyes pain or smart"	174	16.7
Males	87	.....
Females	87	.....
Total "defective vision" one eye only	130	12.5
Males	65	.....
Females	65	.....
Total "defective vision" both eyes	171	16.4
Males	73	42.6
Females	98	57.4
Total "defective vision" (This would be materially increased if 18 teachers reported properly.)	301	28.9
Total "headache"	304	29.2
Males	132	.....
Females	172	.....
Total "other eye trouble" (gran. lids, etc.)	51	4.9
Males	28	.....
Females	23	.....
Total ears "discharge"	33	3.2
Males	20	.....
Females	13	.....
Total ears "ache"	143	13.7
Males	72	.....
Females	78	.....
Total "defective hearing" one ear	159	15.3
Males	81	.....
Females	78	.....
Total "defective hearing" both ears	44	4.2
Males	25	.....
Females	19	.....
Total "tonsils palpable"	188	18.0
Males	98	.....
Females	90	.....
Total "tonsils tender"	153	14.7
Males	77	.....
Females	76	.....
Total "teeth decayed"	508	50.0
Males	249	.....
Females	259	.....
Total "teeth ache"	306	30.0
Males	144	.....
Females	162	.....
Total "nasal obstruction" right	87	8.3
Males	42	.....
Females	45	.....
Total "nasal obstruction" left	93	9.0
Males	43	.....
Females	50	.....
Total "nasal obstruction" both nostrils (15 of these may have been acute.)	68	.....
Total "voice indicating obstruction"	61	5.8
Males	30	.....
Females	31	.....

TABLE SHOWING CONDITION OF PUPILS IN ONEIDA COUNTY RURAL SCHOOLS—Continued.

	Number	Per cent
Total "mouth breathers"	178	17.1
Males	86	.....
Females	92	.....
Total "goiter"	57	5.5
Males	13	.....
Females	44	.....
Total "easily out of breath"	141	13.5
Males	61	.....
Females	80	.....
Total "chronic cough"	11	1.0
Males	4	.....
Females	7	.....
Total "afternoon fever"	38	3.6
Males	11	.....
Females	27	.....
Total "often sick"	87	8.3
Males	41	.....
Females	46	.....
Total "apparent deformity;" sickness or peculiarity	32	3.2
Males	17	.....
Females	15	.....
Total "nervous"	158	15.1
Males	78	.....
Females	80	.....
Total "imbecile"	2	.2
Males	2	.....
Females	0	.....
Total "stupid	7	.7
Males	4	.....
Females	3	.....
Total "dull"	110	10.5
Males	69	.....
Females	41	.....
Total "normal"	461	44.3
Males	241	.....
Females	220	.....
Total "bright"	315	30.3
Males	142	.....
Females	173	.....
Total "very bright"	91	8.7
Males	44	.....
Females	47	.....
Total	.....	94.9
Not rated	.....	5.1
	.....	100.00
Total "using tobacco"	85	8.0
Total "referred by teachers"	105	10.0
Males	41	.....
Females	64	.....
Total "should be referred"	567	54.4
Males	286	.....
Females	281	.....

TABLE SHOWING CONDITION OF PUPILS IN ONEIDA COUNTY RURAL SCHOOLS—Continued.

	Number	Per cent
Total "anaemic"	19	1.8
Males	5	26.3
Females	14	73.7
Total "probably consumptive"	14	1.3
Males	5	35.7
Females	9	64.3
Total "apparently perfectly healthy"	308	30.0
Males	165	.....
Females	143	.....
Number of teachers reporting	60	.....
Number giving satisfactory answers	42	70.0
Number not giving satisfactory replies	18	30.0

APPARENT EFFECTS OF USING TOBACCO.

Ages of Boys Using Tobacco.

18 years	2	10 years	3
17 years	5	9 years	1
16 years	6	8 years	2
15 years	7	7 years	4
14 years	14	6 years	2
13 years	17	5 years	1
12 years	11		
11 years	11	Total	85

	Number	Per cent
Total boys reported	533	.....
Total boys using tobacco	85	16.0
Total boys (23 schools)	254	.....
Per cent of (23 schools)	.....	33.5
Total "sickly"	40	.....
Using tobacco	13	32
Total "often sick"	41	.....
Using tobacco	9	22
Total "dull"	69	.....
Using tobacco	18	26
Total "stupid"	4	.....
Using tobacco	1	25
Total "bright"	142	.....
Using tobacco	10	7
Total "very bright"	44	.....
Using tobacco	*4	9
Total "headache"	132	.....
Using tobacco	32	23
Total "easily out of breath"	61	.....
Using tobacco	15	24
Total "nervous"	78	.....
Using tobacco	15	19
23 teachers reported	85	.....
37 teachers reported	0	.....
Pupils reported to have reformed	15	.....

* All said to have reformed.

The form of report for each pupil in making this inspection was delivered to the teacher and is as follows:

Name of Pupil.....Age.....Grade.....Nat'l.....Sex.....

Parent or Guardian.....Town.....District.....

Height.....Weight.....Robust, sickly. Skin, appearance.....

Eyes: Inflamed, clear, dull, swollen. Do they smart or pain.....Headache.....

Vision: Right.....left..... Other eye trouble.....

Ears: Discharge..... Is it chronic..... Earache..... Describe.....

Hearing: Right. watch.....voice.....left, watch.....voice.....

Tonsils: Palpable.....tender..... Teeth: Decayed.....ache.....

Nose: Obstructed, right.....left..... Voice ind. obstr..... Mouth breather.....

Has child acute cold which might aggravate above conditions.....

Goiter.....Easily out of breath.....Chronic cough.....Afternoon fever.....

Is child often sick.....Any deformity, sickness or peculiarity apparent.....

If so, describe fully.....

Nervous ..... Describe .....

Mentality: Imbecile, stupid, dull, normal, bright, very bright, genius.....

Remarks .....

What diseases has child had.....

Any after effects.....Describe.....

Is condition of child (if abnormal) probably influenced by poverty, kinship of parents, heredity, neglect, use of alcohol by either parent.....

Explain .....

Does the child use tobacco.....In what form and quantity.....

Remarks .....

.....Teacher.

Have you recommended or will you recommend this child for further examination.....

TO MAKE THE TESTS.

(Study rules carefully and mark cards carefully)

Vision Test—Cover left eye (without making pressure on eyeball) and direct each child to look at target (held at 20 feet). The right eye should read letters or see directions in which prongs (of letter E) point. Turn target and observe of child can invariably tell direction of prongs. If not, bring target nearer child till point is found, at which no mistakes are made. This distance, divided by 20 represents the seeing power of child. If this distance is 15 feet, indicate it on the card by the fraction 15-20, etc. Test the other eye in the same manner. If the child can not read target at any distance, see at what distance

child can count fingers. Since the light on different days and in different places affects the results, the teacher may compare the child's vision with her own, which should be known to be normal.

Hearing Test—With watch—Close left ear and find farthest distance that right ear can hear the watch tick. Note the distances in feet or inches. Repeat several times, being sure that child does not see the distance the watch is from side of head. If it can be heard only when touching head, record as "contact." Test left ear in same manner. With voice—test each ear separately, as above. Speak in rather low voice and find distance at which you can be heard. This test is comparative and can be well made by testing several pupils at one time, being sure that they are all the same distance from you.

Tonsils—Slight pressure below angle of jaw on each side will discover enlarged tonsils. The child will cringe if they are tender. Often the tonsils may be seen (sometimes almost filling the throat) if child opens mouth widely and faces a good light.

To Examine Teeth—A thorough examination can not ordinarily be made, but a casual one will often disclose decayed, irregular teeth or a filthy mouth that needs attention.

To Examine Nose and Breathing Ability—Direct child to close left nostril by placing finger against the wing of the nose and instruct to inhale and exhale through open nostril. The air should pass freely through it. Test other nostril in same way. Next—Ask child to say "common", if there is obstruction, the child will say "cobbod". The facial aspect of a child with adenoids is almost characteristic, and mouth breathing will usually be observed.

Caution—In drawing conclusions from above tests, allowance should be made for acute catarrh in the upper air passages, as this may affect any or all of the tests. (Except test for vision).

In addition to above, the teacher is expected to be on the watch constantly for acute illness and indisposition among pupils, as by so doing many lives may be saved.

FIFTH BIENNIAL REPORT OF THE STATE LABORATORY OF HYGIENE.

From Jan. 1, 1912 to Dec. 31, 1913.

W. D. STOVALL, M. D., Bacteriologist, Madison.

E. J. TULLY, S. B., Chemist, Madison.

REPORT OF THE STATE LABORATORY OF HYGIENE

The tables here given are a tabulation of the work done at the Laboratory during the years of 1912 and 1913; according to months showing how the work is distributed throughout the year; and according to counties showing those sections of the State from which the Laboratory receives the most work, and those from which very little is received.

By a study of these tables a comprehensive notion may be had of the proportion the different examinations have to one another and the proportion of positive to negative results.

Tables No. 1 and 2 show Dane county by far in the lead of any of the others as to the number of examinations done during the year. This is due to the fact that the Laboratory is conveniently situated for the physicians in Madison and they have accepted the advantages which the Laboratory offers in a clinical way. The tabulations in tables 1 and 2, while they show rather an uneven distribution of the work over the State, still there is encouragement to be found in the fact that the tabulation for 1913 shows an increase in nearly every portion of the State, and therefore evidence of increasing popularity of the Laboratory. It has served in many cases to aid in quelling epidemics and its value in the raising of quarantines is one that can not and has not been overlooked. It is in this particular work that the Laboratory serves its best purpose for it is through efficient quarantining that epidemics are prevented in communities and especially in schools. A good deal of the unevenness of distribution of the work over the State is doubtless due to the fact that some physicians are so far removed from Madison that they feel a diagnosis can not be returned in sufficient time to be of service.

This however, is a construction of the wide scope which the Laboratory should be allowed, for in such instances the aid of the Laboratory is sought only in that it may be of service as an immediate diagnosis. This, while one of the functions of the Laboratory, is only one. The other, it appears, is much broader, and therefore renders far more service. The latter is the province the Laboratory occupies in regard to the raising of quarantine. In suspected cases of diphtheria, the clinical symptoms being present, the treatment should be that of diphtheria awaiting the reply from the Laboratory.

If the reply is a report negative to diphtheria, then the patient will be spared the disinfection necessary after that disease, and the quarantine may not be so long and strict. On the other hand, if the diagnosis of diphtheria is made, and the patient is held in quarantine, the length of time required, even at the end of that time he or she may still harbor the organisms in their throats, and as a consequence the whole community may be locked in quarantine which may entail a very great economic loss as well as an educational loss to the children. It seems then that no one is so far removed from the Laboratory as to prohibit this service which the Laboratory offers.

The counties further north are the ones from which the fewest number of specimens are received, so that the distance may be an important factor in this, but it should not be if the proper relation of the Laboratory to the work it is endeavoring to carry out could be realized.

There are still other reasons for the small showing from other counties. A good many of the large towns have municipal laboratories for carrying out just such work as the State Laboratory is doing, and because of the convenience of these, and the earlier date at which a report may be had, these laboratories are used to a great extent, so that in those counties in which there is a large population and in which are situated towns of considerable size, there may be only a few specimens sent to the State Laboratory. Tables No. 1 and No. 2 are quite gratifying to those who are interested in the welfare of the Laboratory in that they show an increase in the amount of work done in 1913 over that of 1912, and also an increase of the amount of work coming from the different counties. It is also gratifying to know that the towns and communities are manifesting an increased interest as shown by these tables in their water supply. This increase in the number of water analyses done during the year 1913 is fairly uniform, being in proportion to the size of the county, which is evidence that the rural districts are beginning to take care of their water supply, seeing to it that the wells are properly protected, and situated, and that the water is good. The samples of water received at the Laboratory are taken from public supplies used by cities and towns; semi-public from wells, springs, and other reservoirs, the water from which is used for domestic purposes, and those supplies which are restricted to private use. In addition to these, a considerable number of the examinations are classified as miscellaneous. These examinations were made in connection with stream pollution investigations; analyses of sewage and sewage effluent, which were undertaken for the purpose of determining the efficiency of sewage disposal plants; analyses of industrial wastes, which were being studied with a view to recommending suitable and economic methods of purification so that the discharges would prevent stream pollution. The analyses done in

these cases are either bacteriological, or both bacteriological and chemical. The majority of the health officers of the district or town from which the sample comes either requests the particular examination desired, or the Laboratory decides upon the information obtained as to what work needs to be done. This is one great advantage of having the health officer as the official representative of the Laboratory in every case, as it is then possible to have them survey the situation and request the analysis desired, and also have them submit adequate information as to the conditions prevailing at the source of the supply. The majority of the samples arriving at the Laboratory are accompanied with very meagre, if any, information as to the surroundings of the supply, being submitted because of suspicion regarding their safety due to offensive odors and bad taste.

Unusual cases call for special investigation, and in these instances the State Board of Health authorizes such a study as is necessary. Under special investigation may be classed the sanitary survey of the water supplies of the cities of Oshkosh, Kenosha, and Fond du Lac, which were made for the purpose of determining the general quality of the water and the constancy of the character of the supply, and to aid in securing suitable water.

Tables Nos. 3 and 4 show the work done in each month, and the proportion of the different examinations made to each other. It will be noticed that one tabulation is made under the head of miscellaneous. This includes all examinations made not coming under either diphtheria, sputum, typhoid, water or rabies. It includes the examination of a variety of material some of which is work prescribed to be done, and others which are done in order to accommodate the physician or health officer. That material coming into the Laboratory for diagnosis and is also compulsory is pus for actinomycosis, material from animals suspected of having died of anthrax, pus for gonococci, and urine and feces, especially for the isolation of the typhoid bacillus in a case of typhoid carrier. A large per cent of course of this work consists of smears made from cases of suspected gonorrhoea. By far the majority of such slides are found to be positive to the infectious agent suspected. The number of specimens submitted increase greatly during the spring and summer months, and fall to a low mark during the winter. By some of the physicians seeking the Laboratory's aid in such cases, specimens are returned from time to time during the treatment, so that the Laboratory is able to get a complete record of these cases. In this way it often happens that a month's report may show comparatively few cases of gonorrhoea, most of the reports being on cases which have been under treatment for some time, and as a result the organisms are absent.

As for actinomycosis and anthrax, however, very few examinations are made during the year, and for this reason there is very little to be said regarding these two diseases.

The other material which is listed in the Laboratory as miscellaneous is pus for the determination of any infecting agent. This comes sometimes as the raw material, and at others already cultured. In these cases the report consists of simply naming the organism found.

Cerebrospinal fluid is very often received at the Laboratory to determine the diagnosis. All such examinations are also classified under miscellaneous. By far the greatest number of such specimens are seen by microscopic examination to be a perfectly clear fluid, and nothing positive can be determined. In such cases animal inoculation sometimes proves the condition to be of tubercular origin.

These tables show sputum examination, numbering 2,073 for 1912, 2,706 for 1913, to be the biggest item of the work, and next to sputum is diphtheria. They indicate more examinations of sputum from March 1st, until July 1st, than during any other four months of the year. This may be accounted for by the constantly changing weather when there is a few days of moderation in the temperature, and then a fall of the thermometer at which time people become imprudent, exposing themselves, and consequently contract a cold. This attack may be the starting point of a recognizable case of tuberculosis. The illness may hold on so tenaciously that the physician more to satisfy himself that nothing serious is wrong than that he actually suspects tuberculosis, sends a specimen of the patient's sputum to the Laboratory for diagnosis. A positive diagnosis may come as quite a surprise in these cases. Or the patient may be one who has been suspected of being tuberculous, but whose illness, not being acute enough to demand medical aid, may go until he is brought down by a well-known spring cold, and the specimen of sputum submitted at this time confirms what was suspected. That the changeable temperature encouraging exposure may account for the increased number of specimens seems to be substantiated by the fact that during these months the percentage of positive to negative is lowered, which makes it appear that while some cases which have been only suspicious or diagnosed positive that the majority prove to be bronchitis or some milder form of illness. These cases of bronchitis being more numerous during these months therefore account for the increased amount of work done at the Laboratory in this particular field.

The percentage of positive to negative vary slightly from month to month, the average, however, is little over 20 per cent positive. I must say here that in this percentage recognition is taken of those specimens which are sent in from patients known to be tubercular and the examination of whose sputum has before been positive, and among this number also are patients in the different state and private sanitoria.

By a study of these tables concerning diphtheria nothing extraordinary is learned regarding the prevalence of the disease during

the different seasons of the year nor is there anything interesting shown concerning the occurrence of epidemics. In both the tables 3 and 4 there is an increase shown in the number of cases during the winter months and a fall during the summer months. This may be explained by the fact that with the opening of school many children are brought together and occupy the same room for the greater part of the day so that one case exposes a great many children, and consequently, more cases follow than during the vacation months when one case has the opportunity of exposing only a few. A diphtheria carrier can often be found as the conveyor of the infection. Such a one attending school would, of course, have more disastrous effect than if their associations were restricted to a few within the neighborhood. The epidemics are shown in the tables by a very decided increase in the number of diagnoses made during the month. The percentage of positive to negative run a little over 20 per cent. This is the average for the month. The percentages vary widely from month to month as is shown; in January 1912 only 13 per cent were positive; in November 41 per cent. It will be noticed also that in November only 150 examinations were made while in January 391, or a little over twice as many. This may be attributed to the fact that during an epidemic swabs are taken from throats of those who have been exposed. This being a routine procedure, many throats are swabbed which are not infectious and therefore, the number of positive at the Laboratory decreased.

The tabulations for 1912 show that 1,599 cultures were examined; in 1913 only 1,004. During the year 1912 the number of examinations were greatly increased owing to an epidemic at one of the state institutions. While the number of examinations made in 1912 exceed those made in 1913, nevertheless the laboratory shows an increase in the total amount of work done during 1913 over that done in 1912. It may further be seen that the percentage of positive to negative were greater in 1913 than 1912. This may be explained by the fact that during the epidemic in 1912 swabs were taken indiscriminately as a routine for the sake of precaution.

The number of reactions carried out for the diagnosis of typhoid does not indicate anything unusual. The number of Widals done fluctuates with the incidence of typhoid fever.

The decrease in the number of positives diagnoses of rabies made in the last year is very noticable, there being only 14 positive in 1913 while in 1912 there were 76. There is also a very noticable increase in the total number of diagnosis. The first is the result of the enforcing of the muzzling of all dogs in those sections where the disease was prevalent the year before. This is a striking example of what may be done to rid a community of this alarming infection. At the present time there is very little trouble in the State from this cause, and by the close and strict adherence to the law requiring all owners of dogs and cats to have a license for same and to prohibit these from running at large there is every reason to

believe that the State be made free from this disease. There is always an increase in the number of heads examined during the summer months while in the winter there are comparatively few. This is because the old idea still remains in many places that rabies is a disease of the summer. The season, however, has nothing to do with its occurence as is shown in the tables. In 1912 the highest mark for positive heads was reached in March, and there was equally as many positive during the winter months of that year as there were during the summer. In 1913 there were more positive diagnosis made in January than any other month save May. The confining of animals suspected of being rabid is the most certain and sure method to follow for a diagnosis, and is being learned by a great many throughout the State, so that this may account to some extent for the decrease in the number of examinations made during the last year.

The summary of the work is to a degree encouraging and is as follows:

That the Laboratory is being used in all parts of the State and its usefulness is increasing every year.

That the water supply of the State is being looked after more closely and in some cases monthly examinations are being made and that special investigation has been requested in certain instances.

That the usefulness of the Laboratory in the way of diagnosis in cases of suspected tuberculosis, diphtheria, typhoid fever, and many other diseases named as miscellaneous, and as a means of indicating the length of quarantine is rapidly growing.

The tables given are simply a tabulation of the routine work done in the Laboratory in the last two years. That is to say, they have taken into account only that work which was sent to the Laboratory requesting a diagnosis. Inasmuch as there is other work, and in particular one branch of the work, the making of typhoid vaccine, which has not been taken into account, and because it is esteemed so important a part of the Laboratory service, it is thought advisable to mention it here.

Until three years ago typhoid vaccine was not furnished free of charge to the physician. After the use of it in other places, and notably in the army, had proven beyond doubt that it was a reliable prevention against typhoid fever, the Laboratory decided that it could do no greater service than to offer free of charge this treatment. So that in 1911 typhoid vaccine could be had at the Laboratory without charge. Advantage of this has not been accepted as it should have nor as it seems it would have. The State has a great many cases of typhoid fever every year and usually a few epidemics. This can be avoided; and by very slight inconvenience to both the person taking the treatment and the physician who administers it. The time it would take to write a request for the amount of vaccine needed and to complete the treatment is indeed

a small matter when we consider that it is seldom that a patient going through a spell of typhold fever is able to be up within a month. Those who take this treatment are seldom so sick that if there is business to which attention must be given that they can not go about it the following morning after having received an injection in the afternoon.

The first injection is called No. 1 and is so made that suspended in one c. c. of the solution there are 500,000,000 dead typhoid bacilli. This should be taken late in the afternoon, no supper should be eaten, and before going to bed a purgative should be taken. During the evening there will in all probability be a feeling of lassitude and a slight headache. The worn-out feeling will persist throughout the next day but not so much so, as to prevent the attention being given to urgent matters. On the following morning, or twenty-four hours later, the effect will have worn off, and a feeling of perfect health restored.

Sometimes it happens that the reaction is much more severe than has been described and the patient may be quite sick for two or three days.

The second injection is twice the size of the first, and should be administered ten days later.

With such prevention so easily obtained it seems that everyone in the State would be eager to secure it. It is hoped that the value of this will be realized more fully, and especially by the physicians throughout the State, and that they will coöperate with the public health authorities in ridding the State of this infection. There is no doubt that the State can be freed from typhoid fever epidemics if everyone is made to realize the value of the typhoid vaccine. This, of course, can not be accomplished without the help of every physician in the State.

So important is this matter that although the figures which are given here are without the limit of this report, it is justifiable to use them to impress what has been said.

The Laboratory since beginning to furnish typhoid vaccine free of charge has sent out 13,585 doses. In the early part of this year, between March and May, 4,371 doses were requested.

TABLE NO. I.—LABORATORY REPORT FOR THE TWELVE MONTHS ENDING DEC. 31, 1912.

County	Diphtheria		Typhoid		Tuberculosis sputum		Water		Rabies		Miscellaneous	Total
	+	—	+	—	+	—	+	—	+	—		
Adams	5	16			1	3						25
Ashland		13	6	8	8	15	9	33			3	95
Barron	2	24	3	15	2	10	2	2	1		5	66
Bayfield	1	5			4	11	4	6		1		32
Brown	1	7	1	3	10	26		4		1	6	59
Buffalo		3		2	2	5					2	14
Burnett	3	10		1				4				18
Calumet		1	1	4	3	13		1	2		4	29
Chippewa	3	6	4	10	1	4		3			6	37
Clark	13	20		5	1	9	2	9		1	11	71
Columbia	6	36	4	10	24	77	6	5	2	2	14	186
Crawford			2	7	6	14		5				34
Dane	101	645	41	126	68	209	12	71	3	5	261	1,542
Dodge	23	51	2	16	14	36	1	4			5	152
Door	2	3	2	2	3	35		1		1	1	50
Douglas		2				8		2			1	13
Dunn		1	1	19	7	19		1			6	54
Eau Claire	3	8	10	10	4	12	2	10	1		26	86
Florence											1	1
Fond du Lac	4	4	5	10	12	48		6	6		10	105
Forest	1	5		2	4	7						19
Grant	5	13	4	18	16	53	2	11		1	6	129
Green	6	11	2	5	3	15	6	4	2		4	58
Green Lake		2		1	1	14					2	20
Iowa		3		2	2	4		9			4	24
Iron							9	11	1		1	22
Jackson		2				5						7
Jefferson	2	11	6	33	35	80				2	13	182
Juneau	1	14	3	6	7	30		4			4	69
Kenosha	6	22	8	11	1	4	35	36	4	1	8	136
Kewaunee	3	8		2	2	7		16				38
La Crosse	2	3	4	1			1	11			1	23
Lafayette	2	6	1	1	3	6	5	8			3	35
Langlade					3	1					2	6
Lincoln	2	2		2	4	20		8			3	41
Manitowoc	1	17	4	19	9	30	4	11		1	7	103
Marathon	9	30	25	33	18	18	14	21		1	17	186
Marinette	19	65	1	10	5	27	12	42	4	4	4	193
Marquette		2		4	3	9						18
Milwaukee			1	6	18	23	4	6	5	1	1	65
Monroe	2	10	9	22	6	17	7	20			3	96
Oconto		8			6	25			2	1		42
Oneida				5		3		2			2	12
Outagamie	2	3	7	25	11	31	5	14	5	1	8	112
Ozaukee		1		1	3	12		1	4	1	3	26
Pepin			1	2	2	22						27
Pierce	1	9	2	4	5	25		2			1	49
Polk	1	4	2	10	4	7		4	1	1		34
Portage		2		1	3	15		1	1		2	25
Price		1			8	18		6			1	34
Racine	1	8	7	16	36	64	3	14	3	1	10	163
Richland		1		1	4	12			1	1	1	21
Rock	13	36	5	14	8	56	1	9		4	14	160
Rusk		1	1	6	2	6	1	2			4	23
St. Croix	4	14	2	17	5	26	2	4			4	78
Sauk	11	18	5	27	8	50	3	11	1		8	142
Sawyer				3	1	1		1			2	8
Shawano	6			13	3	26	3	2	9	3	1	66
Sheboygan	1	4	5	10	8	20	2	5	5		1	61
Taylor						2						2
Trempealeau	2	4	1	4	8	17	1	5			4	46
Vernon	1			4	2	6		8			8	29

TABLE NO. I—Continued. LABORATORY REPORT FOR THE TWELVE MONTHS ENDING DEC. 31, 1912.

County	Diphtheria		Typhoid		Tuberculosis sputum		Water		Rabies		Miscellaneous	Total
	+	—	+	—	+	—	+	—	+	—		
Vilas	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Walworth	15	9	3	6	1	9	3	15	.....	.....	3	64
Washburn	.....	.....	.....	1	2	8	.....	.....	.....	.....	.....	11
Washington	17	48	10	19	12	21	5	6	5	1	3	147
Waukesha	4	12	4	9	10	41	7	29	3	2	6	127
Waupaca	3	14	1	3	24	40	.....	5	1	3	1	95
Waushara	22	42	.....	2	3	8	.....	8	.....	.....	2	87
Winnebago	17	18	6	15	5	17	38	59	2	1	5	183
Wood	3	9	4	13	10	57	2	16	2	1	24	141
Total	352	1,347	216	657	504	1,569	213	614	76	43	563	6,154

TABLE NO. II.—LABORATORY REPORT FOR THE TWELVE MONTHS ENDING DEC. 31, 1913.

County	Diphtheria		Tuberculosis sputum		Typhoid		Water		Rabies		Miscellaneous	Total
	+	—	+	—	+	—	+	—	+	—		
Adams	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	1
Ashland	1	5	6	12	2	15	26	40	.....	.....	3	110
Barron	6	16	1	19	1	20	.....	1	.....	.....	7	71
Bayfield	1	4	9	20	5	6	7	13	.....	.....	.....	65
Brown	1	2	14	56	1	5	.....	.....	1	1	16	97
Buffalo	.....	2	1	6	.....	1	2	5	.....	.....	2	19
Burnett	1	3	.....	4	.....	6	.....	3	.....	.....	4	21
Calumet	.....	3	9	25	5	10	.....	.....	.....	.....	.....	52
Chippewa	2	2	5	31	1	7	4	4	.....	.....	5	61
Clark	.....	7	2	12	.....	1	2	6	.....	1	2	33
Columbia	2	10	17	77	3	18	1	8	.....	.....	15	151
Crawford	3	5	8	27	2	10	1	1	.....	.....	.....	57
Dane	82	283	83	230	24	144	51	100	.....	3	272	1,272
Dodge	11	43	18	40	2	14	11	15	1	3	3	161
Door	.....	2	3	12	.....	4	.....	.....	.....	.....	1	22
Douglas	1	3	2	14	.....	3	.....	1	.....	.....	.....	24
Dunn	.....	1	4	28	3	16	10	3	.....	.....	6	71
Eau Claire	1	4	11	50	4	29	.....	.....	.....	.....	14	113
Florence	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fond du Lac	2	16	13	58	12	53	37	50	1	.....	21	263
Forest	5	11	6	21	.....	.....	5	7	.....	.....	1	56
Grant	7	16	20	70	2	11	3	9	.....	1	4	143
Green	.....	7	8	49	1	12	1	3	.....	1	11	93
Green Lake	2	6	5	16	3	5	11	3	.....	.....	2	53
Iowa	4	10	6	17	1	3	8	8	.....	.....	5	62
Iron	1	2	2	9	.....	.....	9	7	.....	.....	.....	30
Jackson	.....	1	2	4	.....	.....	.....	1	.....	.....	.....	8
Jefferson	.....	8	23	112	3	24	5	.....	.....	2	17	194
Juneau	5	10	5	18	2	7	1	1	1	.....	3	53
Kenosha	18	67	1	4	9	11	6	2	.....	3	10	131
Kewaunee	.....	1	10	11	.....	.....	.....	1	.....	.....	.....	23
La Crosse	4	2	1	.....	2	3	.....	1	.....	.....	5	18

TABLE NO. II—Continued. LABORATORY REPORT FOR THE TWELVE MONTHS ENDING DEC. 31, 1913.

County	Diphtheria		Tuberculosis sputum		Typhoid		Water		Rabies		Miscellaneous	Total
	+	—	+	—	+	—	+	—	+	—		
Lafayette	1	1	3	8	.....	8	2	1	.....	.....	.....	24
Langlade	1	1	6	15	.....	.....	1	7	.....	.....	.....	31
Lincoln	.....	6	4	19	1	10	7	8	.....	.....	.....	55
Manitowoc	1	18	13	45	5	23	4	3	.....	1	12	125
Marathon	4	31	10	58	15	32	15	25	.....	2	19	211
Marinette	2	18	4	33	2	7	15	37	1	1	16	136
Marquette	4	2	1	8	.....	1	.....	4	.....	1	.....	21
Milwaukee	3	3	18	29	2	4	9	7	.....	1	1	77
Monroe	11	14	4	28	4	22	5	12	.....	1	7	107
Oconto	.....	6	1	14	.....	1	.....	.....	.....	3	2	27
Oneida	1	4	1	6	1	3	3	4	.....	.....	.....	23
Outagamie	5	19	26	51	5	19	13	18	4	1	17	178
Ozaukee	.....	.....	1	16	.....	.....	1	.....	.....	.....	.....	18
Pepin	6	14	4	19	2	3	.....	.....	.....	.....	3	51
Pierce	4	15	6	18	1	2	.....	.....	.....	.....	1	47
Polk	3	16	4	23	1	10	2	3	.....	.....	1	63
Portage	.....	7	6	13	.....	2	6	12	.....	1	1	48
Price	.....	5	6	17	.....	1	1	1	.....	.....	.....	31
Racine	15	39	35	80	2	18	2	2	.....	2	5	200
Richland	1	1	6	27	1	4	4	4	.....	1	3	52
Rock	14	50	17	65	4	25	4	6	.....	.....	8	193
Rusk	.....	4	2	13	.....	3	4	3	.....	.....	2	31
St. Croix	9	19	9	40	1	39	.....	1	.....	.....	2	120
Sauk	19	32	7	43	1	10	.....	14	.....	.....	5	131
Sawyer	.....	.....	1	3	.....	1	2	4	.....	.....	.....	11
Shawano	.....	1	14	61	.....	7	4	1	3	3	2	96
Sheboygan	1	3	9	21	5	18	6	22	1	.....	2	88
Taylor	3	1	1	4	.....	.....	3	.....	.....	.....	3	15
Trempealeau	2	14	4	21	1	8	.....	3	.....	.....	6	59
Vernon	.....	.....	2	9	3	8	2	3	.....	.....	.....	27
Vilas	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Walworth	4	18	3	17	4	13	11	10	.....	1	6	87
Washburn	.....	.....	1	6	.....	.....	4	5	.....	.....	4	20
Washington	1	25	11	17	1	30	7	6	.....	.....	2	100
Waukesha	7	13	14	51	1	9	13	25	.....	.....	6	139
Waupaca	5	7	18	67	3	12	6	4	.....	1	3	126
Waushara	10	11	7	14	.....	1	.....	.....	1	1	9	54
Winnebago	5	21	6	38	5	26	10	13	.....	3	10	137
Wood	4	8	15	41	4	18	18	22	.....	.....	10	140
Total	306	999	595	2,111	163	836	385	583	14	38	597	6,627

TABLE NO. III—SHOWING SPECIMENS EXAMINED AT THE LABORATORY BY MONTHS DURING THE CALENDAR YEAR OF 1912.

Month.	Diphtheria.		Tuberculosis sputum.		Typhoid.		Water.		Rabies.		Miscellaneous.	Total.
	+	—	+	—	+	—	+	—	+	—		
January	54	337	39	102	17	37	11	26	8	4	42	677
February	47	196	38	103	12	49	5	32	7	3	30	522
March	25	180	38	123	8	52	9	33	12	3	79	562
April	14	101	33	139	7	37	4	39	6	6	59	445
May	2	51	37	142	5	44	2	49	4	5	39	380
June	7	42	47	141	10	44	21	57	7	5	42	423
July	24	36	42	171	13	57	35	103	6	3	42	532
August	26	48	45	129	23	78	38	65	6	4	50	512
September	29	70	39	101	55	81	50	40	10	5	39	519
October	41	110	54	145	33	75	22	54	2	3	53	592
November	62	88	43	112	13	49	5	40	5	2	47	466
December	21	88	49	161	20	54	11	76	3	.....	41	524
Total	352	1,347	504	1,569	216	657	213	614	76	43	563	6,154

TABLE NO. IV—SHOWING SPECIMENS EXAMINED AT THE LABORATORY BY MONTHS DURING THE CALENDAR YEAR OF 1913.

Month.	Diphtheria.		Tuberculosis sputum.		Typhoid.		Water.		Rabies.		Miscellaneous.	Total.
	+	—	+	—	+	—	+	—	+	—		
January	67	90	42	182	8	54	30	11	4	1	63	522
February	42	151	45	165	11	50	24	24	2	1	56	571
March	41	115	47	193	9	59	22	63	2	.....	59	610
April	29	83	50	219	16	75	22	71	1	6	73	645
May	26	55	44	191	18	58	64	36	4	7	58	561
June	11	43	46	193	12	89	22	70	.....	5	55	546
July	16	50	62	196	11	109	57	83	.....	3	59	646
August	22	57	52	159	11	89	41	44	.....	.....	63	538
September	14	84	45	153	27	75	51	48	.....	4	110	611
October	36	79	52	157	20	56	23	44	1	4	1	473
November	19	101	50	127	10	68	14	33	.....	4	.....	426
December	13	91	60	176	10	54	15	56	.....	3	.....	478
Total	306	999	595	2,111	163	836	385	583	14	38	597	6,627

REPORT

OF THE

Bureau of Vital Statistics

OF THE

STATE OF WISCONSIN

FOR THE PERIOD

From January 1, 1912, to December 31, 1913

STATE BOARD OF HEALTH AND BUREAU OF VITAL STATISTICS.

WM. F. WHYTE, President ..... Watertown

C. H. SUTHERLAND, M. D. ..... Janesville

C. H. STODDARD, M. D. ..... Milwaukee

E. S. HAYES, M. D. ..... Eau Claire

H. A. MEILIKE, M. D. ..... Clintonville

OTHO FIEDLER, M. D. ..... Sheboygan

C. A. HARPER, M. D., State Health Officer and Registrar of Vital Statistics ..... Madison

---

L. W. HUTCHCROFT, Chief Statistician ..... Madison

LETTER OF TRANSMITTAL.

OFFICE OF THE

STATE BOARD OF HEALTH AND BUREAU OF VITAL STATISTICS.

Madison, Wis., October, 1914.

To His Excellency, Francis McGovern,

Governor of the State of Wisconsin.

Sir: In compliance with the requirements of law, I have the honor to submit to you a detailed abstract of the Births, Deaths and Marriages that were registered in Wisconsin from January 1, 1912, to December 31, 1913. The report of Divorces covers the period from October 1, 1911, to September 30, 1913.

Very respectfully yours,

C. A. HARPER,

State Registrar of Vital Statistics.

GENERAL SUMMARY.

A SUMMARIZED STATEMENT OF BIRTHS, DEATHS, MARRIAGES AND DIVORCES.

Reported by the local registrars of the various townships, incorporated villages and cities from January 1, 1912, to December 31, 1913, and divorce statistics, reported by the clerks of the courts having jurisdiction in divorce actions for the period from October 1, 1911, to September 30, 1913.

BIRTHS REPORTED DURING CALENDAR YEAR 1912.

Sex:	
Males	28,087
Females	26,326
Sex not stated	80
Total births reported, including stillbirths	54,493
Annual birth rate per one thousand estimated population	22.8
Parentage:	
Both parents native born	33,503
Father native and mother foreign	2,829
Father foreign and mother native	6,355
Both parents foreign born	11,036
Birthplace of one, or both parents unknown	770
Total	54,493
Stillbirths:	
Males	607
Females	441
Sex not stated	25
Total	1,073

Twin Births:	
Males	634
Females	595
Sex not stated	4
Total	1,233
Illegitimate Births:	
Males	419
Females	415
Sex not stated	7
Total	841
Triplets	24

BIRTHS REPORTED DURING CALENDAR YEAR 1913.

Sex:	
Males	28,509
Females	26,663
Sex not stated	65
Total births reported, including stillbirths	55,237
Annual birth rate per one thousand estimated population	22.9
Parentage:	
Both parents native born	34,507
Father native and mother foreign	2,696
Father foreign and mother native	6,356
Both parents foreign born	10,942
Birthplace of one, or both parents unknown	736
Total	55,237
Stillbirths:	
Males	466
Females	366
Sex not stated	30
Total	862
Twin Births:	
Males	371
Females	363
Sex not stated	0
Total	734

Illegitimate Births:	
Males	427
Females	392
Sex not stated	3
Total	823
Triplets	12

DEATHS REPORTED DURING CALENDAR YEAR OF 1912.

(Exclusive of stillbirths)

Sex:	
Males	14,832
Females	12,167
Sex not stated	1
Total	27,000
Male excess	2,665
Annual death rate per thousand estimated population	11.3
Total stillbirths reported as deaths	1,699
Color:	
White	26,792
Black	57
Indian	138
Unknown	13
Total	27,000
Conjugal Condition:	
Single	11,212
Married	9,757
Widowed	5,550
Divorced	193
Not stated or unknown	288
Total	27,000

DEATHS REPORTED DURING CALENDAR YEAR OF 1913.

(Exclusive of stillbirths)

Sex:	
Males	15,656
Females	12,197
Sex not stated	3
Total	27,856

Male excess	3,459
Annual death rate per thousand estimated population	11.5
Total stillbirths reported as deaths	1,610

Color:

White	27,640
Black	57
Indian	152
Unknown	7
Total	27,856

Conjugal Condition:

Single	11,563
Married	10,183
Widowed	5,607
Divorced	208
Not stated or unknown	295
Total	27,856

Nativity of Deceased for 1912 and 1913:

Wisconsin	24,953
Other United States	8,244
German	10,300
Irish	1,535
Great Britain	1,312
Norwegian	2,206
Swedish	777
Polish	787
Welsh	2
Danish	390
Italian	138
French	65
Canadian	887
Bohemian	467
Russian	335
Austrian	515
Other foreign countries	1,188
Unknown	757
Total	54,858

Nativity of Father for 1912 and 1913:

Wisconsin	9,078
Other United States	7,328
Foreign born	34,803
Birthplace unknown or not stated	3,649
Total	54,858

Nativity of Mother for 1912 and 1913:

Wisconsin	10,626
Other United States	7,147
Foreign born	33,193
Birthplace unknown or not stated	3,892
Total	54,858

MARRIAGES REPORTED DURING THE CALENDAR YEAR OF 1912.

Both parties native born	14,672
Groom native, bride foreign	876
Groom foreign, bride native	2,038
Both parties foreign born	2,380
Birthplace of one or both unknown	159
Total marriages	20,125
Annual marriage rate per one thousand estimated population	16.9

MARRIAGES BY AGE GROUPS:

Brides:

Under 15 years	18
15 to 19 years	4,269
20 to 24 years	9,398
25 to 29 years	3,628
30 to 34 years	1,186
35 to 39 years	649
40 to 44 years	369
45 to 49 years	233
50 to 54 years	132
55 to 59 years	66
60 to 79 years	80
80 years of age or over	1
Age not stated	96
Total	20,125

Grooms:

Under 15 years	None
15 to 19 years	343
20 to 24 years	7,888
25 to 29 years	6,601
30 to 34 years	2,442
35 to 39 years	1,124

40 to 44 years	626
45 to 49 years	436
50 to 54 years	239
55 to 59 years	131
60 to 79 years	216
80 years of age or over	6
Age not stated	73
Total	20,125

MARRIAGES REPORTED DURING THE CALENDAR YEAR OF 1913

Both parties native born	15,533
Groom native, bride foreign	842
Groom foreign, bride native	1,961
Both parties foreign born	2,598
Birthplace of one or both unknown	118
Total marriages	21,052
Annual marriage rate per one thousand estimated population	17.4

MARRIAGES BY AGE GROUPS.

Brides:

Under 15 years	2
15 to 19 years	4,730
20 to 24 years	9,678
25 to 29 years	3,877
30 to 34 years	1,193
35 to 39 years	624
40 to 44 years	320
45 to 49 years	233
50 to 54 years	159
55 to 59 years	71
60 to 79 years	78
80 years of age or over	1
Age not stated	86
Total	21,052

Grooms:

Under 15 years	None
15 to 19 years	388
20 to 24 years	8,349
25 to 29 years	6,979
30 to 34 years	2,563

35 to 39 years	1,106
40 to 44 years	584
45 to 49 years	379
50 to 54 years	270
55 to 59 years	157
60 to 79 years	207
80 years of age or over	7
Age not stated	63
Total	21,052

DIVORCES.

Total divorces from Oct. 1, 1911, to Sept. 30, 1912	1,615
Annual divorce rate per one thousand marriages	80.2
Divorces granted to husband	342
Divorces granted to wife	1,273
By Causes:	
Drunkenness	162
Adultery	59
Cruelty	552
Desertion	558
Neglect to provide	214

DIVORCES.

Total divorces from Oct. 1, 1912, to Sept. 30, 1913	1,391
Annual divorce rate per one thousand marriages	66.07
Divorces granted to husband	292
Divorces granted to wife	1,099
By Causes:	
Drunkenness	117
Adultery	50
Cruelty	520
Desertion	454
Neglect to provide	181

TABLE NO. I. DEATHS RECORDED FROM CERTAIN DISEASES AND CAUSES BY CALENDAR YEARS SINCE 1908.

Name of Disease.	1908	1909	1910	1911	1912	1913
Typhoid fever	322	337	558	319	310	237
Smallpox	9	16	3	2	3	4
Measles	96	170	158	248	127	337
Scarlet fever	133	372	304	225	283	197
Whooping Cough	192	225	200	224	232	211
Diphtheria	417	416	429	332	279	293
Influenza	543	302	187	360	255	356
Erysipelas	38	66	71	95	69	68
Tuberculosis	2,509	2,546	2,404	2,405	2,362	2,328
Cancer	1,513	1,645	1,539	1,622	1,673	1,755
Meningitis	465	382	478	437	280	290
Apoplexy	1,182	1,232	1,351	1,428	1,466	1,448
Heart disease	2,200	2,337	1,916	1,778	2,408	2,370
Bronchitis	693	555	526	487	525	478
Pneumonia	1,622	1,615	2,253	2,227	2,066	2,172
Diarrhea (under 2 yrs.)	1,509	1,487	1,503	1,233	1,145	1,229
Bright's disease	1,198	1,302	1,337	1,429	1,371	1,358
Puerperal septicemia	112	101	110	155	77	96
Congenital debility	564	549	563	1,694	1,582	1,736
Old age	1,079	1,091	1,791	1,333	1,362	1,403
Suicide	291	304	318	281	306	317
Accidental deaths	1,655	1,629	1,150	1,490	1,632	1,707
Homicides	48	41	41	44	38	54

TABLE NO. 2. SHOWING TOTAL BIRTHS, DEATHS, MARRIAGES AND DIVORCES REPORTED DURING THE CALENDAR YEAR OF 1912.

County.	Estimated population 1912.	Births.		Deaths.		Stillbirths.	Marriages.		Divorces Oct. 1, 1911, to Sept. 30, 1912.
		Total births.	Birth rate per 1,000.	Total deaths exclusive of stillbirths.	Death rate per 1,000.		Total marriages.	Marriage rate per 1,000	
Adams	8,604	174	20.2	104	12.	6	53	12.3	.....
Ashland	21,965	477	21.7	268	12.2	12	153	13.9	.....
Barron	29,408	641	21.7	274	9.3	20	196	13.3	6
Bayfield	16,019	314	19.6	116	7.2	10	78	8.4	5
Brown	54,922	1,465	26.6	706	12.8	36	468	17.	24
Buffalo	16,006	367	22.9	139	8.6	3	91	11.3	1
Burnett	9,026	243	26.9	87	9.6	3	56	12.4	7
Calumet	16,701	396	23.7	133	7.9	5	116	13.8	2
Chippewa	32,143	626	19.4	362	11.2	14	253	15.7	5
Clark	30,047	720	23.9	230	7.6	7	198	13.1	14
Columbia	31,129	556	17.8	363	11.6	11	222	14.2	12
Crawford	16,288	368	22.5	182	11.1	4	155	19.	7
Dane	78,185	1,670	21.3	840	10.7	35	582	14.8	61
Dodge	48,100	1,046	21.7	484	10.6	13	330	13.7	23
Door	18,711	403	21.5	180	9.6	3	125	13.3	11
Douglas	48,990	844	17.2	446	9.1	12	392	16.	44
Dunn	25,260	546	21.6	222	8.7	14	206	16.3	1
Eau Claire	32,721	637	19.4	360	11.	14	263	16.	22
Florence	3,381	65	19.2	26	7.6	2	23	13.6	.....
Fond du Lac	51,924	1,145	22.0	678	13.	10	390	15.	46
Forest	7,108	189	26.5	71	9.9	3	48	11.4	3
Grant	39,007	837	21.4	423	10.8	17	255	13.4	31
Green	21,641	355	16.4	193	8.9	1	160	14.8	4
Green Lake	15,491	298	19.2	145	9.3	4	117	15.1	4
Iowa	22,497	443	19.6	225	10.	7	165	14.6	6
Iron	9,004	216	23.9	91	10.1	5	72	15.9	.....
Jackson	17,057	339	19.8	182	10.6	11	93	10.9	4
Jefferson	34,312	591	17.2	422	12.2	11	253	14.7	17
Juneau	19,569	352	17.9	218	11.1	10	131	13.3	10
Kenosha	35,149	1,064	30.2	485	13.7	19	477	27.1	37
Kewaunee	16,784	240	20.2	185	11.	6	124	14.8	4
La Crosse	44,454	902	20.2	538	12.1	11	407	18.3	38
Lafayette	20,075	396	19.7	210	10.4	9	128	12.7	5
Langlade	17,590	466	26.4	149	8.4	14	152	17.2	12
Lincoln	19,064	457	23.9	167	8.7	9	138	14.4	6
Manitowoc	45,050	1,075	23.8	490	10.8	21	375	16.6	15
Marathon	56,976	1,609	28.2	582	10.2	26	440	15.4	33
Marinette	33,844	774	22.8	373	11.	20	163	9.6	17
Marquette	10,741	223	20.7	100	9.3	2	100	18.6	2
Milwaukee	460,973	12,170	26.4	6,528	14.1	262	5,156	22.3	541
Monroe	28,881	574	19.8	262	9.	9	216	14.9	8
Oconto	26,087	651	24.9	229	8.7	18	152	11.6	8
Oneida	11,511	237	20.5	114	9.9	5	75	13.	8
Outagamie	49,136	1,163	23.6	484	9.9	22	353	14.3	19
Ozaukee	17,123	381	22.0	182	10.6	1	138	16.1	7
Pepin	7,581	154	20.3	82	10.8	.....	39	10.2	2
Pierce	22,079	389	17.6	220	9.9	11	99	8.9	7
Polk	21,559	543	25.1	200	9.2	13	113	10.4	8
Portage	30,979	780	25.1	332	10.7	14	276	17.8	16
Price	14,371	338	23.5	126	8.7	4	95	13.2	3

TABLE NO. 2.—Concluded. SHOWING TOTAL BIRTHS, DEATHS, MARRIAGES AND DIVORCES REPORTED DURING THE CALENDAR YEAR OF 1912.

County.	Estimated population 1912.	Births.		Deaths.		Stillbirths.	Marriages.		Divorces Oct. 1, 1911, to Sept. 30, 1912.
		Total births.	Birth rate per 1,000.	Total deaths exclusive of stillbirths.	Death rate per 1,000.		Total marriages.	Marriage rate per 1,000	
Racine	60,302	1,294	21.4	710	11.7	23	545	18.	67
Richland	18,809	531	28.2	221	11.7	8	148	15.7	17
Rock	56,296	1,195	21.2	697	12.3	35	412	14.6	50
Rusk	11,724	305	26.0	114	9.7	1	108	18.4	7
St. Croix	25,910	535	20.6	259	9.9	5	452	31.	14
Sauk	32,887	674	20.4	334	10.1	20	304	21.5	30
Sawyer	6,699	129	19.2	63	9.4	3	50	14.9	4
Shawano	32,222	948	29.4	316	9.8	23	237	14.7	12
Sheboygan	56,014	1,308	23.3	602	10.7	40	537	19.1	13
Taylor	14,105	369	26.1	139	9.8	6	86	12.1	12
Trempealeau	22,928	471	20.5	212	9.2	6	156	13.6	1
Vernon	28,116	615	21.8	285	10.1	7	209	14.8	16
Vilas	6,251	134	21.4	40	6.3	4	25	7.9	.....
Walworth	29,614	407	13.7	366	12.3	13	203	13.7	23
Washburn	8,625	218	25.4	73	8.4	2	57	10.8	6
Washington	23,970	495	20.6	258	10.7	6	219	10.8	1
Waukesha	37,868	602	15.8	458	12.	11	273	14.4	27
Waupaca	32,782	674	20.5	379	11.5	20	273	16.6	29
Waushara	19,630	478	24.3	177	9.	7	129	13.1	12
Winnebago	63,205	1,321	20.9	765	12.1	27	611	19.3	89
Wood	30,703	781	25.4	324	10.5	7	231	15.	19
Total	2,382,771	54,493	22.8	27,000	11.3	1,073	20,125	16.9	1,615

TABLE NO. 3. SHOWING BIRTHS, DEATHS, MARRIAGES AND DIVORCES REPORTED DURING THE CALENDAR YEAR OF 1913.

County.	Estimated population 1913.	Births.		Deaths.		Stillbirths.	Marriages.		Divorces Oct. 3, 1912, to Sept. 30, 1913.
		Total.	Rate per 1,000.	Total, exclusive stillbirths.	Rate per 1,000.		Total marriages.	Rate per 1,000	
Adams	8,604	240	27.9	103	11.9	11	59	12.4	1
Ashland	21,965	422	19.2	287	13.0	4	145	13.6	16
Barron	29,555	613	20.7	297	10.0	14	237	19.4	7
Bayfield	16,035	277	17.2	111	6.9	4	74	9.2	9
Brown	55,334	1,449	26.1	753	13.6	24	440	15.9	25
Buffalo	16,006	361	22.5	127	7.9	6	92	12.1	2
Burnett	9,026	210	23.2	92	10.1	3	59	13.0	2
Calumet	16,701	398	23.8	160	9.5	6	104	12.5	3
Chippewa	32,163	702	21.8	385	11.9	14	262	16.2	6
Clark	30,047	743	24.7	254	8.4	7	263	17.5	27
Columbia	31,129	619	19.8	382	12.2	15	267	16.7	.....
Crawford	16,288	311	19.0	203	12.4	11	134	16.4	17
Dane	78,560	1,836	23.3	928	11.9	32	653	17.8	54
Dodge	48,432	1,046	21.5	528	10.1	32	339	13.9	12
Door	18,711	484	25.8	158	8.4	16	158	16.8	3
Douglas	49,774	945	18.9	580	11.6	24	404	16.2	51
Dunn	25,260	558	22.0	235	9.2	5	204	16.3	14
Eau Claire	32,721	692	21.1	423	12.9	6	321	19.5	18
Florence	3,381	55	16.2	33	9.4	.....	19	11.5	2
Fond du Lac	52,081	1,045	20.6	631	12.1	5	479	18.3	19
Forest	7,271	221	30.3	62	8.5	4	33	9.0	.....
Grant	39,007	793	20.3	402	10.3	12	281	14.4	16
Green	21,641	418	19.3	434	10.8	5	161	14.8	13
Green Lake	15,491	286	18.4	193	12.4	6	108	13.9	7
Iowa	22,497	415	18.4	204	9.0	6	157	13.9	9
Iron	9,357	221	23.6	99	10.5	4	83	17.7	7
Jackson	17,057	330	19.3	170	9.9	3	112	13.1	6
Jefferson	34,315	599	17.4	406	11.8	6	289	16.8	26
Juneau	19,569	361	18.4	220	11.2	4	164	16.7	7
Kenosha	36,259	1,039	28.6	387	10.6	8	418	23.0	38
Kewaunee	16,784	369	21.9	177	10.5	2	151	17.9	1
La Crosse	44,683	937	20.9	579	12.9	17	432	19.3	23
Lafayette	20,075	427	21.2	167	8.3	9	156	15.5	9
Langlade	17,854	491	27.5	165	9.2	3	136	15.2	16
Lincoln	19,064	424	22.2	165	8.6	7	86	9.0	14
Manitowoc	45,086	1,079	23.9	494	10.9	15	427	18.9	14
Marathon	57,937	1,605	27.7	556	9.5	27	457	15.7	.....
Marinette	33,860	747	22.0	330	9.7	13	192	11.0	16
Marquette	10,741	204	18.9	119	11.0	2	88	16.4	1
Milwaukee	474,866	12,721	26.7	6,627	13.9	240	5,432	22.8	261
Monroe	28,881	580	20.2	317	10.9	7	238	16.4	11
Oconto	26,302	585	22.2	234	8.8	6	144	10.9	13
Oneida	11,550	236	20.3	64	5.5	2	69	11.9	9
Outagamie	49,153	1,105	22.4	584	11.8	23	420	17.0	54
Ozaukee	17,123	365	21.3	174	10.1	5	147	17.1	8
Pepin	7,583	135	17.2	87	11.4	1	58	15.2	1
Pierce	22,079	372	16.8	234	10.5	5	104	9.4	8
Polk	21,655	495	22.8	206	9.5	6	126	11.1	1
Portage	30,996	878	28.3	336	10.8	13	281	18.1	24
Price	14,659	332	22.6	115	7.8	5	74	10.0	9
Racine	61,741	1,396	22.6	714	11.5	20	482	15.5	140
Richland	18,809	452	24.0	165	8.7	7	150	15.9	21
Rock	56,675	1,168	20.6	662	11.6	18	472	16.6	71
Rusk	12,006	327	27.2	128	10.6	4	87	12.9	6
St. Croix	25,910	516	19.9	282	10.8	5	399	30.7	9

TABLE NO. 3.—Concluded. SHOWING BIRTHS, DEATHS, MARRIAGES AND DIVORCES REPORTED DURING THE CALENDAR YEAR OF 1913.

County.	Estimated population 1913.	Births.		Deaths.		Stillbirths.	Marriages.		Divorces Oct. 3, 1912, to Sept. 30, 1913.
		Total.	Rate per 1,000.	Total, exclusive stillbirths.	Rate per 1,000.		Total marriages.	Rate per 1,000.	
Sauk	32,896	644	19.6	336	10.2	5	267	16.0	29
Sawyer	6,935	128	18.4	74	10.6	1	33	9.6	2
Shawano	32,391	852	26.3	346	10.6	12	49	15.3	11
Sheboygan	56,577	1,304	23.0	680	12.0	11	546	19.2	.....
Taylor	14,337	408	28.4	145	10.1	3	110	15.3	5
Trempealeau	22,928	535	23.3	234	10.2	7	173	15.0	8
Vernon	28,116	583	20.7	244	8.6	6	230	16.3	.....
Vilas	6,367	118	18.5	35	5.4	2	16	5.0	.....
Walworth	29,614	430	14.5	392	13.2	3	216	14.5	14
Washburn	8,625	240	27.8	87	10.0	1	84	19.4	13
Washington	23,970	505	21.0	248	10.3	6	192	16.0	3
Waukesha	37,868	569	15.0	485	12.8	9	307	16.2	33
Waupaca	32,782	682	20.8	395	12.0	14	262	15.9	22
Waushara	19,630	444	22.9	192	9.7	3	109	11.1	3
Winnebago	63,205	1,376	21.7	856	13.5	15	654	20.6	69
Wood	30,703	789	25.6	371	12.0	5	277	18.0	22
Total	2,407,249	55,237	22.9	27,858	11.5	862	21,052	17.4	1,391

BIRTHS.

For the calendar year of 1912, 54,493 births including stillbirths were reported by the various local registrars throughout the state. This represents an annual birth rate for the state of 22.8 per thousand gross estimated population. For the calendar year of 1913, 55,237 births were reported. This represents a birth rate for 1913 of 22.9 per thousand population.

Based upon investigations made by the State Board of Health and also investigations by the Bureau of the Census, birth registration in Wisconsin is approximately 90 per cent correct. This means that out of every 100 births occurring in the state during the year, 90 or more of them are properly recorded as the law requires. This is a very satisfactory showing as compared with birth registration in other states but we hope during the next biennial period to increase the accuracy of birth registration very materially.

The greatest difficulty is encountered in cases where a physician or midwife is not employed. Some of the physicians are still negligent about reporting the births which they attend within 5 days after the date of birth, but such persons can be successfully dealt with through the penalty provision of the law. A much different situation presents itself in cases where a physician or midwife is not employed and the parents are responsible for filing the birth certificate. In most instances the parents do not know of the requirements of the law and have no knowledge of the value of the birth record in safeguarding the civil and property rights of helpless children.

Of the total births reported during 1912, 28,087 were males; 26,326 were females and in 80 cases the sex of the child was unknown or not stated.

During 1912, 1,073 stillbirths were reported as births; 841 illegitimate births were recorded; 1,233 twin births and 24 triplets.

Classifying the births reported for 1912 according to the nativity of the parents, it is shown that 33,503 were born of native parents; 2,829 had native fathers and foreign mothers; 6,355 had foreign fathers and native mothers; 11,036 were children with both parents foreign born; 770 were children where the nativity of one or both of the parents was unknown or not stated.

Table No. 5, shows the total number of births reported by counties arranged according to the sex and nativity of the parents.

Table No. 6, stillbirths, twin births and illegitmate births by counties arranged according to sex.

The classification of stillbirths by sex shows that 607 were males, 441 females and in 25 cases the sex was unknown or not stated.

Twin births arranged according to sex show that 634 were males, 595 females and in 4 cases the sex was not stated.

In the case of illegitimate births there were 419 males. 415 females and in 7 cases the sex was unknown or not stated.

Of the total births reported during the calendar year of 1913, 28,509 were males, 26,663 were females and in 65 cases the sex was unknown or not stated.

During 1913, 862 stillbirths were reported as births, 823 illegitimate births were reported, 734 twin births and 12 triplets.

Classifying the births reported during 1913 according to the nativity of the parents it is shown that 34,507 were born of native parents; 2,696 had native fathers and foreign mothers; 6,356 had foreign fathers and native mothers; 10,942 were born of foreign parents and 736 were children where the nativity of one or both parents was unknown or not stated.

Table No. 7, shows the total number of births reported by counties arranged according to the sex and nativity of parents.

Table No. 8, shows stillbirths, twin births and illegitimate births by counties arranged according to sex.

The classification of stillbirths by sex shows that 466 were males, 366 females and in 30 cases the sex was unknown or not stated.

Twin births arranged according to sex show 371 were males and 363 were females. In the case of illegitimate births there were 427 males, 392 females and in 3 cases the sex was unknown or not stated.

TABLE NO. 4. BIRTHS IN WISCONSIN BY CALENDAR YEARS.

Counties.	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913
Adams	115	137	123	142	154	197	201	173	168	174	240
Ashland	180	407	453	474	589	553	499	488	419	477	422
Barron	449	474	471	521	635	656	673	725	605	641	613
Bayfield	124	129	306	283	306	254	298	325	315	314	277
Brown	1,114	1,180	1,484	1,658	1,586	1,508	1,367	1,492	1,471	1,465	1,449
Buffalo	41	61	200	229	415	319	289	324	276	367	361
Burnett	103	98	129	148	166	207	173	187	170	243	210
Calumet	336	357	458	382	506	402	396	382	359	396	398
Chippewa	398	402	553	540	515	583	555	585	609	626	702
Clark	415	461	440	493	599	850	725	653	656	720	743
Columbia	343	486	530	542	623	598	573	610	509	556	619
Crawford	157	150	225	241	201	399	370	312	376	368	311
Dane	744	790	1,113	1,095	1,384	1,384	1,436	1,550	1,528	1,670	1,836
Dodge	604	818	817	829	961	974	950	1,003	977	1,046	1,046
Door	416	467	480	453	385	519	459	517	477	403	484
Douglas	676	681	558	725	1,025	1,018	922	816	859	844	945
Dunn	319	363	452	410	493	500	498	490	543	546	558
Eau Claire	361	494	533	499	678	582	541	590	599	637	692
Florence	56	55	56	105	68	57	57	64	62	65	55
Fond du Lac	556	907	1,000	897	1,254	1,216	1,063	1,126	1,121	1,145	1,045
Forest	48	65	100	111	168	229	188	162	188	189	221
Grant	535	550	655	723	903	906	835	846	787	837	793
Green	.....	312	339	457	352	409	451	407	403	355	418
Green Lake	163	168	211	246	274	310	311	324	311	298	286
Iowa	164	245	318	341	470	451	387	444	408	443	415
Iron	109	193	173	267	220	208	181	188	215	216	221
Jackson	282	291	340	291	349	330	326	292	317	339	330
Jefferson	480	543	551	519	715	687	568	576	600	591	599
Juneau	.....	387	346	301	330	342	342	329	309	352	361
Kenosha	536	611	624	702	710	867	903	959	939	1,064	1,039
Kewaunee	380	404	431	387	446	449	462	413	378	340	369
La Crosse	624	333	690	796	945	880	889	944	852	902	937
Lafayette	188	410	299	418	413	464	432	408	358	396	427
Langlade	286	289	378	389	345	455	432	451	474	466	491
Lincoln	237	156	430	495	507	527	450	461	473	457	424
Manitowoc	880	1,065	1,024	1,117	1,384	1,160	1,101	1,074	1,136	1,075	1,079
Marathon	802	.....	1,146	1,188	1,576	1,501	1,517	1,535	1,535	1,609	1,605
Marinette	.....	997	980	853	813	762	794	724	690	774	747
Marquette	101	179	118	146	238	189	190	204	206	223	204
Milwaukee	9,329	8,925	8,905	8,863	9,193	10771	10520	11033	12263	12170	12721
Monroe	348	341	598	598	551	626	580	587	540	574	580
Oconto	430	590	532	575	653	628	643	609	658	651	585
Oneida	152	167	137	213	250	214	194	208	237	237	238
Outagamie	1,172	1,152	1,342	1,265	1,334	1,134	1,183	1,262	1,200	1,163	1,105
Ozaukee	276	202	276	315	364	383	339	338	383	381	365
Pepin	86	78	127	122	172	170	140	152	156	154	131
Pierce	205	219	253	301	330	442	444	438	404	389	372
Polk	259	280	355	353	392	496	451	473	458	543	495
Portage	329	525	547	571	837	720	741	796	758	780	878
Price	188	261	180	156	174	290	238	289	294	338	332
Racine	998	1,133	1,013	1,060	1,347	1,299	1,211	1,285	1,349	1,294	1,396
Richland	193	269	360	350	451	487	435	459	465	531	452
Rock	666	726	939	952	1,148	1,172	1,112	1,043	1,053	1,195	1,168
Rusk	68	75	159	179	229	234	208	226	245	305	327
St. Croix	301	323	334	477	487	497	474	518	461	535	516
Sauk	.....	500	469	499	611	601	665	608	565	674	644
Sawyer	62	87	59	139	120	133	128	128	134	129	128
Shawano	410	601	324	432	679	830	854	802	774	948	852
Sheboygan	700	1,183	994	1,221	1,441	1,229	1,217	1,294	1,224	1,308	1,304
Taylor	162	208	222	183	242	353	353	348	364	369	408
Trempealeau	390	377	340	408	516	507	510	525	534	471	535
Vernon	307	357	333	331	439	610	601	551	569	615	583
Vilas	85	87	81	72	76	102	98	115	123	134	118
Walworth	320	507	484	356	443	502	466	419	413	407	430
Washburn	98	129	192	85	287	201	212	192	217	218	240
Washington	283	446	490	526	610	515	494	496	449	495	505
Waukesha	449	595	549	611	716	726	690	651	584	602	569
Waupaca	403	552	642	658	720	755	736	759	705	674	682
Waushara	144	231	316	327	422	447	416	483	433	478	444
Winnebago	1,036	1,163	1,115	1,471	1,275	1,238	1,323	1,212	1,198	1,321	1,376
Wood	398	428	520	677	712	780	732	809	761	781	789
Total	33,574	38,832	42,631	44,759	50,922	52,994	51,212	52,261	52,653	54,493	55,237

TABLE NO. 5. SHOWING BIRTHS REPORTED FROM JAN. 1, 1912, TO DEC. 31, 1912. CLASSIFIED BY COUNTY, SEX AND NATIONALITY OF PARENTS.

County.	Total births.	Sex.			Still-births.	Twin births.	Triplets.	Illegitimate.	Parentage.				
		Male.	Female.	Not stated.					Both parents native born.	Father native and mother foreign.	Mother native and father foreign.	Both parents foreign born.	Birthplace of one or both parents unknown.
Adams	174	89	84	1	6	.....	.....	.....	132	9	13	20	.....
Ashland	477	242	235	.....	12	12	.....	17	188	35	73	173	8
Barron	641	352	288	1	20	26	.....	7	332	48	108	150	3
Bayfield	314	159	153	2	10	6	.....	7	123	20	43	126	2
Brown	1,465	738	724	3	36	40	3	93	1,055	65	147	101	97
Buffalo	367	195	172	.....	3	4	.....	5	293	18	38	15	3
Burnett	243	118	125	.....	3	12	.....	3	146	16	41	38	2
Calumet	396	206	190	.....	5	8	.....	2	354	7	13	20	2
Chippewa	626	318	307	1	14	8	.....	5	427	37	78	80	4
Clark	720	367	352	1	7	8	.....	3	426	38	100	146	10
Columbia	556	277	278	1	11	10	.....	6	428	32	45	46	5
Crawford	368	190	178	.....	4	8	.....	6	325	8	18	9	8
Dane	1,670	857	806	7	35	26	6	7	1,139	95	157	267	12
Dodge	1,046	538	508	.....	13	34	.....	6	735	50	121	135	5
Door	403	198	205	.....	3	10	3	3	299	22	54	25	3
Douglas	844	422	422	.....	12	18	.....	7	264	40	111	412	17
Dunn	546	292	247	7	14	8	.....	6	391	27	75	45	8
Eau Claire	637	331	306	.....	14	10	.....	8	434	45	83	70	5
Florence	65	37	27	1	2	.....	.....	1	26	2	13	22	2
Fond du Lac	1,145	577	565	3	10	24	.....	14	880	49	100	101	15
Forest	189	106	83	.....	3	6	.....	2	144	11	20	13	1
Grant	837	443	392	2	17	16	.....	13	745	18	34	22	18
Green	355	186	166	3	1	4	.....	4	210	19	57	64	5
Green Lake	298	170	128	.....	4	8	.....	2	212	18	38	27	3
Iowa	443	218	223	2	7	12	.....	2	354	13	38	34	4
Iron	216	119	97	.....	5	8	.....	1	37	4	27	146	2
Jackson	339	179	157	3	11	12	.....	2	246	15	40	32	6
Jefferson	591	307	283	1	11	12	.....	4	428	31	66	60	6
Juneau	352	183	168	1	10	4	.....	1	257	21	38	32	4
Kenosha	1,064	527	535	2	19	16	.....	6	418	52	95	489	10

Kewaunee	**340**	**166**	**174**	.....	**6**	**8**	.....	**1**	**311**	**4**	**16**	**8**	**1**
La Crosse	**902**	**451**	**450**	**1**	**11**	**14**	.....	**17**	**659**	**49**	**104**	**80**	**10**
Lafayette	**396**	**203**	**193**	.....	**9**	**8**	.....	**4**	**320**	**10**	**28**	**35**	**3**
Langlade	**466**	**252**	**214**	.....	**14**	**8**	.....	**3**	**301**	**35**	**61**	**64**	**5**
Lincoln	457	236	220	1	9	16	.....	3	269	40	65	79	4
Manitowoc	1,075	544	529	2	21	24	.....	7	898	40	70	53	14
Marathon	1,609	778	826	5	26	26	.....	17	996	90	273	231	19
Marinette	774	395	379	.....	20	24	.....	8	394	56	121	198	5
Marquette	223	109	114	.....	2	6	.....	2	181	9	21	12	.....
Milwaukee	12,170	6,275	5,891	4	262	256	6	303	5,310	641	1,574	4,416	229
Monroe	574	292	282	.....	9	14	.....	11	469	14	55	28	8
Oconto	651	336	315	.....	18	30	.....	12	399	33	93	123	3
Oneida	237	126	111	.....	5	8	.....	4	127	16	36	53	5
Outagamie	1,163	618	543	2	22	38	3	14	869	72	118	95	9
Ozaukee	381	197	184	.....	1	8	.....	1	303	15	22	40	1
Pepin	154	82	72	.....	.....	4	.....	.....	117	8	23	6	.....
Pierce	389	193	196	.....	11	10	.....	8	295	22	39	28	5
Polk	543	283	260	.....	13	18	.....	7	274	45	99	120	5
Portage	780	385	395	.....	14	12	.....	8	529	34	109	93	15
Price	338	160	178	.....	4	12	.....	4	120	22	38	150	8
Racine	1,294	655	635	4	23	24	.....	10	535	77	152	517	13
Richland	531	268	262	1	8	9	.....	15	492	7	17	5	10
Rock	1,195	620	569	6	35	40	.....	37	814	60	124	179	18
Rusk	305	160	145	.....	1	8	.....	4	193	13	38	53	8
St. Croix	535	294	240	1	5	20	.....	4	361	26	79	67	2
Sauk	674	348	326	.....	20	24	.....	2	528	36	72	33	5
Sawyer	129	64	65	.....	3	2	.....	3	75	3	15	35	1
Shawano	948	507	441	.....	23	20	.....	6	673	54	137	82	2
Sheboygan	1,308	698	609	1	40	30	.....	6	736	46	139	370	17
Taylor	369	200	169	.....	6	10	.....	2	159	26	65	116	3
Trempealeau	471	257	213	1	6	4	.....	5	339	30	64	36	2
Vernon	615	319	294	2	7	18	3	10	478	26	73	31	7
Vilas	134	73	60	1	4	.....	.....	1	69	9	13	42	1
Walworth	407	216	190	1	13	2	.....	1	297	94	33	49	4
Washburn	218	128	90	.....	2	2	.....	1	141	15	26	33	3
Washington	495	249	246	.....	6	12	.....	7	436	10	30	19	.....
Waukesha	602	322	280	.....	11	10	.....	16	428	33	58	72	11
Waupaca	674	336	336	2	20	20	.....	6	488	42	86	53	5
Waushara	478	255	222	1	7	6	.....	5	331	28	46	70	3
Winnebago	1,321	701	618	2	27	28	.....	17	847	85	128	239	22
Wood	781	395	386	.....	7	30	.....	6	494	59	111	103	14
Total	54,493	28,087	26,326	80	1,073	1,233	24	841	33,503	2,829	6,355	11,036	770

TABLE NO. 6 SHOWING STILLBIRTHS, TWIN BIRTHS AND ILLEGITIMATE BIRTHS REPORTED FROM JAN. 1, 1912, TO DEC. 31, 1912, CLASSIFIED BY COUNTIES AND SEX.

County.	Stillbirths.				Twin births.				Illegitimate births.				Triplets.		
	Total.	Male.	Female.	Not stated.	Total.	Male.	Female.	Not stated.	Total.	Male.	Female.	Not stated.	Total.	Male.	Female.
Adams	6	4	2	....	....	....	....	....	....	....	....	....	....	....	....
Ashland	12	8	4	....	12	2	10	....	17	8	9	....	....	....	....
Barron	20	9	9	2	26	9	16	1	7	4	3	....	....	....	....
Bayfield	10	6	3	1	6	....	6	....	7	4	3	....	....	....	....
Brown	36	18	17	1	40	18	22	....	93	47	46	....	3	2	1
Buffalo	3	1	2	....	4	2	2	....	5	2	3	....	....	....	....
Burnett	3	3	....	....	12	3	9	....	3	1	2	....	....	....	....
Calumet	5	1	4	....	8	2	6	....	2	2	....	....	....	....	....
Chippewa	14	7	6	1	8	4	4	....	5	3	2	....	....	....	....
Clark	7	5	2	....	8	6	2	....	3	3	....	....	....	....	....
Columbia	11	5	7	1	10	4	6	....	6	5	1	....	....	....	....
Crawford	4	2	2	....	8	3	5	....	6	4	2	....	....	....	....
Dane	35	23	12	....	26	16	10	....	7	4	3	....	6	2	4
Dodge	13	6	7	....	34	13	21	....	6	4	2	....	....	....	....
Door	3	3	....	....	10	4	6	....	3	1	2	....	3	1	2
Douglas	12	7	5	....	18	13	5	....	7	2	5	....	....	....	....
Dunn	14	6	2	6	8	6	2	....	6	5	1	....	....	....	....
Eau Claire	14	9	5	....	10	6	4	....	8	5	3	....	....	....	....
Florence	2	1	....	1	....	....	....	....	....	....	....	1	....	....	....
Fond du Lac	10	6	4	....	24	17	7	....	14	8	6	....	....	....	....
Forest	3	2	1	....	6	5	1	....	2	....	2	....	....	....	....
Grant	17	8	9	....	16	8	8	....	13	5	8	....	....	....	....
Green	1	1	....	....	4	1	3	....	4	3	1	....	....	....	....
Green Lake	4	2	2	....	8	7	1	....	2	2	....	....	....	....	....
Iowa	7	4	3	....	12	7	5	....	2	....	2	....	....	....	....
Iron	5	5	....	....	8	5	3	....	1	1	....	....	....	....	....
Jackson	11	8	3	....	12	7	4	1	2	2	....	....	....	....	....
Jefferson	11	5	6	....	12	7	5	....	4	1	3	....	....	....	....
Juneau	10	6	3	1	4	4	....	....	1	....	1	....	....	....	....
Kenosha	19	11	8	....	16	10	6	....	6	4	2	....	....	....	....
Kewaunee	6	2	4	....	8	6	2	....	1	1	....	....	....	....	....
La Crosse	11	7	4	....	14	9	5	....	17	6	11	....	....	....	....
Lafayette	9	5	4	....	8	5	3	....	4	3	1	....	....	....	....
Langlade	14	11	3	....	8	4	4	....	3	2	1	....	....	....	....
Lincoln	9	6	3	....	16	8	8	....	3	1	2	....	....	....	....
Manitowoc	21	15	6	....	24	13	11	....	7	5	2	....	....	....	....
Marathon	26	11	13	2	26	14	12	....	17	9	8	....	....	....	....
Marinette	20	12	8	....	24	16	8	....	8	3	5	....	....	....	....
Marquette	2	1	1	....	6	3	3	....	2	1	1	....	....	....	....
Milwaukee	262	145	117	....	256	127	129	....	303	162	140	1	6	....	6
Monroe	9	1	8	....	14	6	8	....	11	6	5	....	....	....	....
Oconto	18	7	11	....	30	15	15	....	12	7	5	....	....	....	....
Oneida	5	4	1	....	8	4	4	....	4	1	3	....	....	....	....
Outagamie	22	10	10	2	38	20	16	2	14	2	9	3	3	1	2
Ozaukee	1	....	1	....	8	4	4	....	1	....	1	....	....	....	....
Pepin	....	....	....	....	4	2	2	....	....	....	....	....	....	....	....
Pierce	11	8	3	....	10	6	4	....	8	4	4	....	....	....	....
Polk	13	9	4	....	18	7	11	....	7	6	1	....	....	....	....
Portage	14	8	6	....	12	5	7	....	8	5	3	....	....	....	....
Price	4	2	2	....	12	6	6	....	4	....	4	....	....	....	....
Racine	23	9	10	4	24	8	16	....	10	4	6	....	....	....	....
Richland	8	5	3	....	9	6	3	....	15	6	9	....	....	....	....
Rock	35	19	14	2	40	24	16	....	37	15	22	....	....	....	....
Rusk	1	....	1	....	8	4	4	....	4	3	1	....	....	....	....
St. Croix	5	2	3	....	20	11	9	....	4	1	3	....	....	....	....

TABLE NO. 6.—Concluded. SHOWING STILLBIRTHS, TWIN BIRTHS AND ILLEGITIMATE BIRTHS REPORTED FROM JAN. 1, 1912, TO DEC. 31, 1912, CLASSIFIED BY COUNTIES AND SEX.

County.	Stillbirths.				Twin births.				Illegitimate births.				Triplets.		
	Total.	Male.	Female.	Not stated.	Total.	Male.	Female.	Not stated.	Total.	Male.	Female.	Not stated.	Total.	Male.	Female.
Sauk	20	12	8	....	24	11	13	....	2	2	....	....	....	....	....
Sawyer	3	3	....	....	2	....	2	....	3	....	3	....	....	....	....
Shawano	23	17	6	....	20	12	8	....	6	3	3	....	....	....	....
Sheboygan	40	27	12	1	30	18	12	....	6	2	4	....	....	....	....
Taylor	6	5	1	....	10	6	4	....	2	....	2	....	....	....	....
Trempealeau	6	4	2	....	4	2	2	....	5	2	3	....	....	....	....
Vernon	7	5	2	....	18	9	9	....	10	5	5	....	3	3	....
Vilas	4	....	4	....	....	....	....	....	1	....	....	1	....	....	....
Walworth	13	6	7	....	2	....	2	....	1	....	1	....	....	....	....
Washburn	2	2	....	....	2	2	....	....	1	....	1	....	....	....	....
Washington	6	3	3	....	12	4	8	....	7	3	4	....	....	....	....
Waukesha	11	7	4	....	10	7	3	....	16	10	6	....	....	....	....
Waupaca	20	10	10	....	20	7	13	....	6	3	3	....	....	....	....
Waushara	7	6	1	....	6	2	4	....	5	1	4	....	....	....	....
Winnebago	27	16	11	....	28	16	12	....	17	4	12	1	....	....	....
Wood	7	5	2	....	30	16	14	....	6	1	5	....	....	....	....
Total	1,073	607	441	25	1,233	634	595	4	841	419	415	7	24	9	15

TABLE NO. 7.—SHOWING BIRTHS REPORTED FROM JAN. 1, 1913, TO DEC. 31, 1913, CLASSIFIED BY COUNTY, SEX, AND NATIONALITY OF PARENTS.

County.	Total births.	Sex.			Still-births.	Twin births.	Triplets.	Illegiti-mate.	Parentage.				
		Male.	Female.	Not stated.					Both parents native born.	Father native and mother foreign.	Mother native and father foreign.	Both parents foreign born.	Birthplace of one or both parents unknown.
Adams	240	137	103	.....	11	12	.....	2	193	8	22	14	3
Ashland	422	228	194	.....	4	8	.....	9	178	33	65	140	6
Barron	613	305	308	.....	14	14	.....	5	359	35	92	121	6
Bayfield	277	143	134	.....	4	4	.....	5	359	35	92	121	6
Brown	1,449	755	690	4	24	42	3	88	1,116	57	117	77	82
Buffalo	361	179	180	2	6	10	.....	4	285	15	35	19	7
Burnett	210	111	99	.....	3	2	.....	2	115	15	29	51	.....
Calumet	398	232	166	.....	6	6	.....	4	350	10	15	22	1
Chippewa	702	365	336	1	14	20	.....	3	470	35	83	106	8
Clark	743	395	347	1	7	28	.....	5	452	43	84	155	9
Columbia	619	330	289	.....	15	14	.....	7	473	32	49	61	4
Crawford	311	176	131	4	11	.....	.....	4	280	5	14	8	4
Dane	1,833	926	895	12	32	46	.....	16	1,250	100	168	297	18
Dodge	1,046	548	495	3	32	30	.....	13	755	49	90	145	7
Door	484	255	228	1	16	12	.....	2	367	21	67	27	2
Douglas	945	527	416	2	24	18	.....	16	321	62	118	429	15
Dunn	558	285	273	.....	5	8	.....	7	393	30	69	45	21
Eau Claire	692	359	333	.....	6	2	.....	7	494	31	96	63	8
Florence	55	32	23	.....	.....	.....	.....	2	25	4	10	13	3
Fond du Lac	1,045	551	494	.....	5	2	.....	4	824	36	90	89	6
Forest	221	112	109	.....	4	10	.....	.....	169	5	25	22	.....
Grant	793	419	374	.....	12	12	.....	6	726	13	33	13	8
Green	418	205	213	.....	5	4	.....	2	275	19	56	68	.....
Green Lake	286	148	138	.....	6	2	.....	1	194	17	43	31	1
Iowa	415	217	198	.....	6	2	.....	1	345	7	33	28	2
Iron	221	102	119	.....	4	.....	.....	1	40	8	25	147	1
Jackson	330	173	157	.....	3	.....	.....	1	250	17	31	27	5
Jefferson	599	315	284	.....	6	6	.....	4	456	45	50	46	2
Juneau	361	185	175	1	4	4	....	3	260	17	36	44	4
Kenosha	1,039	520	519	.....	8	6	.....	2	392	61	88	489	9

Kewaunee	369	184	183	2	2	2	3	5	323	12	19	9	6
La Crosse	937	464	471	2	17	4	.....	30	696	45	105	64	27
Lafayette	427	202	223	2	9	2	.....	1	354	10	23	38	2
Langlade	491	256	232	3	3	6	.....	1	358	23	58	50	2
Lincoln	424	228	196	.....	7	.....	.....	8	265	31	63	62	3
Manitowoc	1,079	538	540	1	15	4	.....	10	908	29	67	61	14
Marathon	1,605	826	778	1	27	6	.....	15	1,001	102	262	222	18
Marinette	747	390	356	1	13	2	.....	6	390	48	111	192	6
Marquette	204	102	102	.....	2	.....	.....	.....	168	4	22	10	.....
Milwaukee	12,721	6,581	6,138	2	240	320	3	334	5,535	637	1,469	4,834	246
Monroe	580	295	285	.....	7	2	.....	5	481	13	44	31	11
Oconto	585	313	271	1	6	2	.....	4	379	37	75	91	3
Oneida	238	122	114	2	2	.....	.....	1	130	16	40	52	.....
Outagamie	1,105	580	524	1	23	2	.....	9	838	55	115	91	6
Ozaukee	365	199	166	.....	5	2	.....	1	296	10	15	41	3
Pepin	131	67	64	.....	1	.....	.....	.....	105	3	11	11	1
Pierce	372	168	204	.....	5	.....	.....	1	278	27	26	39	2
Polk	495	255	240	.....	6	.....	.....	4	284	26	84	98	3
Portage	878	446	432	.....	13	2	.....	9	630	35	114	84	15
Price	332	160	172	.....	5	.....	.....	4	124	24	46	134	4
Racine	1,396	727	668	1	20	4	.....	8	590	67	149	579	11
Richland	452	244	207	1	7	.....	.....	3	422	5	13	7	5
Rock	1,168	582	586	.....	18	.....	.....	34	849	53	103	152	11
Rusk	327	168	159	.....	4	4	.....	2	218	12	35	58	4
St. Croix	516	237	277	2	5	.....	.....	1	339	40	66	69	2
Sauk	644	344	300	.....	5	2	.....	5	512	32	56	30	14
Sawyer	128	65	62	1	1	.....	.....	5	88	4	14	20	2
Shawano	852	427	425	.....	12	.....	.....	7	615	33	120	76	8
Sheboygan	1,304	665	639	.....	11	.....	.....	6	737	61	130	373	3
Taylor	408	209	199	.....	3	6	.....	6	184	25	74	124	1
Trempealeau	535	285	250	.....	7	.....	.....	4	389	38	72	34	2
Vernon	583	296	286	1	6	4	.....	6	467	35	47	31	3
Vilas	118	61	55	2	2	.....	.....	4	178	9	23	28	2
Walworth	430	219	210	1	3	6	.....	1	66	6	14	32	.....
Washburn	240	108	132	.....	1	.....	.....	5	302	25	52	45	6
Washington	505	278	226	1	6	4	.....	1	427	12	26	39	1
Waukesha	569	291	278	.....	9	.....	.....	12	433	26	48	57	5
Waupaca	682	357	325	.....	14	16	.....	6	492	45	76	64	5
Waushara	444	235	208	1	3	.....	.....	5	330	12	41	57	4
Winnebago	1,376	705	668	3	15	6	3	21	885	85	141	242	23
Wood	789	395	392	2	5	2	.....	8	524	43	110	106	6
Total	55,237	28,509	26,663	65	862	734	12	823	34,507	2,696	6,356	10,942	736

TABLE NO. 8. SHOWING STILLBIRTHS, TWIN BIRTHS, TRIPLETS AND ILLEGITIMATE BIRTHS REPORTED FROM JAN. 1, 1913, TO DEC. 31, 1913. CLASSIFIED BY COUNTIES AND SEX.

County.	Stillbirths.				Twin births.			Illegitimate births.				Triplets.			
	Total.	Male.	Female.	Not stated.	Total.	Male.	Female.	Total.	Male.	Female.	Not stated.	Total.	Male.	Female.	Not stated.
Adams	11	5	6	....	12	10	2	2	2	....	....	....	....	....	....
Ashland	4	3	1	....	8	3	5	9	7	2	....	....	....	....	....
Barron	14	6	8	....	14	6	8	5	2	3	....	....	....	....	....
Bayfield	4	3	1	....	4	2	2	4	3	1	....	....	....	....	....
Brown	24	13	10	1	42	18	24	88	55	33	....	3	2	1	....
Buffalo	6	4	1	1	10	2	8	4	2	2	....	....	....	....	....
Burnett	3	.....	3	....	2	.....	2	2	.....	2	....	....	....	....	....
Calumet	6	3	3	....	6	3	3	4	3	1	....	....	....	....	....
Chippewa	14	8	6	....	20	9	11	3	1	2	....	....	....	....	....
Clark	7	3	3	1	28	17	11	5	4	1	....	....	....	....	....
Columbia	15	13	2	....	14	6	8	7	3	4	....	....	....	....	....
Crawford	11	5	5	1	.....	.....	.....	4	2	2	....	....	....	....	....
Dane	32	15	15	2	46	29	17	16	4	12	....	....	....	....	....
Dodge	32	17	15	....	30	9	21	13	8	5	....	....	....	....	....
Door	16	11	5	....	12	6	6	2	1	1	....	....	....	....	....
Douglas	24	17	5	2	18	12	6	16	8	8	....	....	....	....	....
Dunn	5	1	3	1	8	4	4	7	3	4	....	....	....	....	....
Eau Claire	6	2	4	....	2	1	1	7	3	4	....	....	....	....	....
Florence	.....	.....	.....	.....	.....	.....	.....	2	1	1	....	....	....	....	....
Fond du Lac	5	2	2	1	2	.....	2	4	2	2	....	....	....	....	....
Forest	4	2	.....	2	10	6	4	.....	.....	.....	....	....	....	....	....
Grant	12	5	7	....	12	7	5	6	2	4	....	....	....	....	....
Green	5	4	1	....	4	1	3	2	.....	2	....	....	....	....	....
Green Lake	6	4	2	....	2	2	.....	1	1	.....	....	....	....	....	....
Iowa	6	2	4	....	2	1	1	1	1	.....	....	....	....	....	....
Iron	4	4	.....	...	.....	.....	.....	1	.....	1	....	....	....	....	....
Jackson	3	.....	3	....	.....	.....	.....	1	.....	1	....	....	....	....	....
Jefferson	6	4	2	....	6	2	4	4	1	3	....	....	....	....	....
Juneau	4	2	2	....	4	2	2	3	1	2	....	....	....	....	....
Kenosha	8	6	2	....	6	.....	6	2	1	1	....	....	....	....	....
Kewaunee	2	1	1	....	2	1	1	5	1	4	....	3	....	2	1
La Crosse	17	10	6	1	4	3	1	30	14	15	1	....	....	....	....
Lafayette	9	5	3	1	2	1	1	1	.....	1	....	....	....	....	....
Langlade	3	2	1	....	6	3	3	1	.....	1	....	....	....	....	....
Lincoln	7	4	3	....	.....	.....	.....	8	3	5	....	....	....	....	....
Manitowoc	15	5	10	....	4	.....	4	10	2	8	....	....	....	....	....
Marathon	27	13	11	3	6	3	3	15	6	8	1	....	....	....	....
Marinette	13	9	4	....	2	2	.....	6	4	2	....	....	....	....	....
Marquette	2	2	....	....	.....	.....	.....	.....	.....	.....	....	....	....	....	....
Milwaukee	240	133	105	2	320	170	150	334	167	167	....	3	2	1	....
Monroe	7	5	2	....	2	1	1	5	1	4	....	....	....	....	....
Oconto	6	4	2	....	2	.....	2	4	2	2	....	....	....	....	....
Oneida	2	1	1	....	.....	.....	.....	1	1	.....	....	....	....	....	....
Outagamie	23	11	9	3	2	.....	2	9	6	3	....	....	....	....	....
Ozaukee	5	3	2	....	2	2	.....	1	1	.....	....	....	....	....	....
Pepin	1	.....	1	....	.....	.....	.....	.....	.....	.....	....	....	....	....	....
Pierce	5	.....	5	....	.....	.....	.....	1	.....	1	....	....	....	....	....
Polk	6	3	2	1	.....	.....	.....	4	2	2	....	....	....	....	....
Portage	13	7	6	....	2	.....	2	9	5	4	....	....	....	....	....
Price	5	2	3	....	.....	.....	.....	4	3	1	....	....	....	....	....
Racine	20	9	9	2	4	2	2	8	4	4	....	....	....	....	....
Richland	7	5	1	1	.....	.....	.....	3	2	.....	1	....	....	....	....
Rock	18	9	8	1	.....	.....	.....	34	19	15	....	....	....	....	....
Rusk	4	3	1	....	4	2	2	2	2	.....	....	....	....	....	....
St. Croix	5	3	2	....	.....	.....	.....	1	.....	1	....	....	....	....	....

TABLE NO. 8.—Concluded. SHOWING STILLBIRTHS, TWIN BIRTHS, TRIPLETS AND ILLEGITIMATE BIRTHS REPORTED FROM JAN. 1, 1913, TO DEC. 31, 1913, CLASSIFIED BY COUNTIES AND SEX.

County.	Stillbirths.				Twin births.			Illegitimate births.				Triplets.			
	Total.	Male.	Female.	Not stated.	Total.	Male.	Female.	Total.	Male.	Female.	Not stated.	Total.	Male.	Female.	Not stated.
Sauk	5	3	2	....	2	.....	2	5	5	.....	....	....	....	....	....
Sawyer	1	.....	1	....	.....	.....	.....	5	1	4	....	....	....	....	....
Shawano	12	4	8	....	.....	.....	.....	7	4	3	....	....	....	....	....
Sheboygan	11	5	4	2	.....	.....	.....	6	5	1	....	....	....	....	....
Taylor	3	1	2	....	6	5	1	6	4	2	....	....	....	....	....
Trempealeau	7	4	3	....	.....	.....	.....	4	2	2	....	....	....	....	....
Vernon	6	3	3	....	4	2	2	6	5	1	....	....	....	....	....
Vilas	2	1	1	....	.....	.....	.....	1	.....	1	....	....	....	....	....
Walworth	3	2	1	....	6	3	3	5	2	3	....	....	....	....	....
Washburn	1	.....	1	....	.....	.....	.....	4	2	2	....	....	....	....	....
Washington	6	4	2	....	4	2	2	1	.....	1	....	....	....	....	....
Waukesha	9	6	3	....	.....	.....	.....	12	10	2	....	....	....	....	....
Waupaca	14	10	4	....	16	6	10	6	5	1	....	....	....	....	....
Waushara	3	1	2	....	.....	.....	.....	5	2	3	....	....	....	....	....
Winnebago	15	8	6	1	6	3	3	21	13	8	....	3	1	2	....
Wood	5	1	4	....	2	2	.....	8	1	7	....	....	....	....	....
Total	862	466	366	30	734	371	363	823	427	393	3	12	5	6	1

MARRIAGES.

During the calendar year 1912, 20,125 marriages or 40,250 persons married were reported to the State Bureau of Vital Statistics. This represents an annual marriage rate of 16.9 persons married per one thousand gross estimated population. The marriage rate for each county is shown by Table No. 9.

In the classification of marriages for each county by calendar years since 1905, as shown by Table No. 9, the number of marriages has increased from 16,315 in 1905 to 21,052 in 1913.

Classifying the marriages reported according to the nativity of the bride and the groom, it is shown by Table No. 10, that there were 14,672 marriages where both parties were native born; 876 marriages where the groom was native and the bride foreign; 2,038 marriages where the groom was foreign and the bride native; 2,380 marriages where both parties were foreign born; and 159 marriages where the birthplace of one or both parties was unknown or not stated.

During the calendar year 1913 as shown by Table No. 9, 21,052 marriages or 42,104 persons married were reported by the various local registrars throughout the state. This represents an annual marriage rate of 17.4 persons married per one thousand gross estimated population. The rate for 1913 is higher than that for any preceding year since the adoption of the uniform registration law. This we believe is partly due to increased accuracy of registration.

Table No. 10, shows a classification of marriages by counties according to the nativity of the bride and groom. In this table we find that there were 15,533 marriages where both parties were native born; 842 marriages where the groom was native and the bride foreign; 1,961 marriages where the groom was foreign and the bride native; 2,598 marriages where both parties were foreign born; and 118 marriages where the birthplace of one or both parties was unknown or not stated.

Tables No. 11 and 13 show the total marriages reported from each county by age groups for both brides and grooms.

TABLE NO. 9. MARRIAGES IN WISCONSIN BY CALENDAR YEARS.

	1905	1906	1907	1908	1909	1910	1911	1912	1913
Adams	66	62	94	50	46	46	38	53	59
Ashland	202	176	199	139	156	137	140	153	145
Barron	202	174	206	205	206	194	197	196	237
Bayfield	100	99	50	62	66	58	76	78	74
Brown	387	480	437	380	418	408	358	468	440
Buffalo	133	121	93	85	90	96	82	91	92
Burnett	54	54	60	54	45	51	45	56	59
Calumet	128	116	129	120	105	97	133	116	104
Chippewa	248	248	252	204	238	259	225	253	262
Clark	194	196	214	238	188	182	181	198	263
Columbia	220	203	226	229	246	224	209	222	267
Crawford	135	141	107	107	135	123	130	155	134
Dane	398	499	540	514	529	512	548	582	653
Dodge	339	352	344	307	299	352	340	330	339
Door	136	122	154	129	115	152	153	125	158
Douglas	277	251	371	341	285	302	398	392	404
Dunn	195	179	185	200	186	190	184	206	204
Eau Claire	228	280	263	251	302	293	255	263	321
Florence	20	18	34	26	20	27	23	23	19
Fond du Lac	399	390	444	406	371	380	406	390	479
Forest	29	30	44	34	37	39	43	48	33
Grant	246	259	284	263	250	254	240	255	281
Green	189	166	188	156	153	184	185	160	161
Green Lake	116	95	115	167	120	129	122	117	108
Iowa	154	150	150	138	158	163	132	165	157
Iron	67	46	128	76	65	59	68	72	83
Jackson	116	104	137	103	103	85	88	93	112
Jefferson	264	253	310	254	281	245	242	253	289
Juneau	157	171	138	130	148	132	141	131	164
Kenosha	306	389	330	316	347	328	407	477	418
Kewaunee	140	141	125	129	126	121	133	124	151
La Crosse	348	385	358	347	400	365	401	407	432
Lafayette	130	128	119	112	130	113	125	128	156
Langlade	111	99	138	117	137	121	117	152	136
Lincoln	136	163	175	135	120	141	160	138	86
Manitowoc	352	351	388	329	373	374	350	375	427
Marathon	366	410	395	377	417	399	423	440	457
Marinette	153	171	200	168	170	152	169	163	192
Marquette	80	77	103	84	94	80	95	100	88
Milwaukee	3,097	3,512	4,675	3,747	4,178	4,689	4,568	5,156	5,432
Monroe	203	218	249	203	201	216	211	216	238
Oconto	155	146	148	107	123	153	156	152	144
Oneida	88	90	87	85	81	88	65	75	69
Outagamie	400	383	361	319	335	359	404	353	420
Ozaukee	120	127	113	115	117	89	163	138	147
Pepin	45	70	60	54	46	60	60	39	58
Pierce	130	111	129	100	108	112	111	99	104
Polk	157	132	126	111	110	121	118	113	126
Portage	230	241	303	239	227	235	246	276	281
Price	75	68	71	57	56	49	80	95	74
Racine	364	388	467	447	414	505	500	545	482
Richland	172	185	152	150	154	168	158	148	150
Rock	262	333	371	391	363	383	406	412	472
Rusk	62	73	103	67	68	80	96	108	87
St. Croix	228	277	301	259	266	274	284	452	399
Sauk	266	280	295	270	254	268	268	304	267
Sawyer	25	40	39	44	24	32	40	50	33
Shawano	177	198	250	283	253	270	263	237	249
Sheboygan	405	413	459	430	428	472	482	537	546
Taylor	72	86	100	95	83	84	76	86	110
Trempealeau	150	170	141	186	172	157	159	156	173
Vernon	205	205	230	207	181	172	207	209	230
Vilas	22	20	23	26	21	17	17	25	16
Walworth	209	206	188	167	177	162	201	203	216
Washburn	56	67	74	60	43	53	60	57	84
Washington	166	161	170	142	162	176	199	219	192
Waukesha	255	284	264	243	255	295	232	273	307
Waupaca	271	253	306	266	260	261	236	273	262
Waushara	109	143	131	102	146	162	120	129	109
Winnebago	465	472	463	439	499	535	576	611	654
Wood	223	227	255	229	236	265	256	231	277
Total	16,315	17,319	19,281	17,122	17,716	18,528	18,780	20,125	21,052

TABLE NO. 10. SHOWING MARRIAGES REPORTED TO THE STATE BUREAU OF VITAL STATISTICS FROM JAN. 1, 1912, TO DEC. 31, 1912, CLASSIFIED BY COUNTIES AND PLACE OF BIRTH.

County.	Total marriages.	Grooms.		Brides.		Both parties native born.	Groom native, bride foreign.	Groom foreign, bride native.	Both parties foreign born.	Birthplace of one or both unknown.	Native born.		Foreign born.		Unknown.	
		Widowed.	Divorced.	Widowed.	Divorced.						Male.	Female.	Male.	Female.	Male.	Female.
Adams	53	8	1	3	5	45	2	3	1	2	49	48	4	3	.....	2
Ashland	153	16	3	10	2	78	14	32	27	2	93	111	59	41	1	1
Barron	196	14	5	12	4	140	9	21	21	5	153	161	43	30	.....	5
Bayfield	78	5	2	7	1	50	3	14	11	.....	53	63	25	15	.....	.....
Brown	468	43	6	31	4	404	17	24	20	3	421	429	45	38	2	1
Buffalo	91	4	.....	1	2	80	5	3	2	1	86	83	5	7	.....	1
Burnett	56	7	.....	2	2	40	5	8	4	.....	108	111	8	5	.....	.....
Calumet	116	11	1	8	.....	107	1	4	3	.....	45	48	11	8	.....	.....
Chippewa	253	16	4	15	5	201	8	31	11	2	210	233	42	19	1	1
Clark	198	15	1	8	6	158	8	16	14	2	166	174	30	23	2	1
Columbia	222	10	10	5	11	181	7	22	11	1	189	203	33	18	.....	1
Crawford	155	10	11	5	7	139	4	10	1	1	144	149	11	5	.....	1
Dane	582	36	8	14	9	455	31	44	42	10	492	502	84	73	6	7
Dodge	330	27	8	18	4	265	14	26	24	1	281	291	49	38	.....	1
Door	125	8	1	6	1	105	2	14	3	1	107	120	17	5	1	.....
Douglas	392	20	5	15	9	203	27	59	100	3	235	270	156	119	1	3
Dunn	206	10	2	8	2	171	10	15	9	1	181	187	24	19	1	.....
Eau Claire	263	19	2	13	8	200	6	24	20	13	213	229	45	26	5	8
Florence	23	3	.....	.....	1	13	3	6	1	.....	16	19	7	4	.....	.....
Fond du Lac	390	12	6	11	7	338	15	22	12	3	355	360	35	27	.....	3
Forest	48	6	.....	3	2	39	.....	4	4	1	40	43	7	5	1	.....
Grant	255	15	7	9	6	233	2	13	4	3	237	247	17	6	1	2
Green	160	9	3	4	1	118	5	11	25	1	123	130	36	30	1	.....
Green Lake	117	9	.....	1	1	89	5	18	5	.....	94	107	23	10	.....	.....
Iowa	165	10	.....	5	.....	148	3	8	4	2	151	158	12	7	2	.....
Iron	72	4	.....	7	2	23	4	1[illegible]	34	.....	27	34	45	38	.....	.....
Jackson	93	5	2	4	2	83	3	5	2	.....	86	88	7	5	.....	.....
Jefferson	253	15	4	7	7	208	11	26	8	.....	218	235	35	18	.....	.....
Juneau	131	9	3	6	4	111	4	9	4	3	115	120	13	9	3	2
Kenosha	477	38	26	22	34	259	21	50	147	.....	280	310	197	167	.....	.....

Kewaunee	124	5	1	5	1	116	1	6	.....	1	118	122	6	1	.....	1
La Crosse	407	28	7	18	7	331	17	36	17	6	351	368	54	33	2	6
Lafayette	128	8	2	4	1	114	4	4	6	.....	118	118	10	10	.....	.....
Langlade	152	9	1	7	2	123	3	15	7	4	130	138	22	10	.....	4
Lincoln	138	7	3	5	1	113	3	16	6	.....	116	129	22	9	.....	.....
Manitowoc	375	16	2	10	3	326	13	27	8	1	339	354	36	20	.....	1
Marathon	440	35	2	27	6	353	19	43	22	3	370	399	68	40	2	1
Marinette	163	11	3	8	3	110	11	25	15	2	122	135	40	26	1	2
Marquette	100	6	2	4	.....	84	1	13	2	.....	85	97	15	3	.....	.....
Milwaukee	5,156	280	178	198	143	3,011	277	636	1,213	19	3,304	3,676	1,846	1,468	6	12
Monroe	216	11	4	11	3	180	8	14	7	7	190	195	21	15	5	6
Oconto	152	9	2	4	2	104	10	26	11	1	115	131	37	20	.....	1
Oneida	75	3	1	.....	3	54	4	8	8	1	59	62	16	12	.....	1
Outagamie	353	21	4	13	5	303	14	19	13	4	320	322	33	27	.....	4
Ozaukee	138	3	1	1	2	114	4	12	7	1	118	127	19	11	1	.....
Pepin	39	2	2	3	.....	32	1	6	.....	.....	33	38	6	1	.....	.....
Pierce	99	6	.....	3	.....	78	6	8	5	2	84	87	14	11	1	1
Polk	113	5	3	5	1	85	1	16	10	1	87	101	26	11	.....	1
Portage	276	11	4	9	3	233	10	19	12	2	243	254	32	22	1	.....
Price	95	4	3	3	1	51	4	7	31	2	56	58	39	35	.....	2
Racine	545	22	17	11	15	335	28	74	106	2	366	409	179	134	.....	2
Richland	148	11	4	3	2	141	1	4	1	1	142	145	5	2	1	1
Rock	412	22	15	12	11	336	18	31	26	1	355	369	57	42	.....	1
Rusk	108	8	1	4	1	76	3	17	12	.....	79	93	29	15	.....	.....
St. Croix	452	38	46	19	68	320	24	63	40	5	349	384	103	63	.....	5
Sauk	304	13	6	8	3	261	11	23	6	3	273	286	29	17	2	1
Sawyer	50	4	1	4	4	39	.....	6	3	2	40	46	9	3	1	1
Shawano	237	14	6	6	7	195	8	28	6	.....	208	223	34	14	.....	.....
Sheboygan	537	34	5	16	5	365	23	60	88	1	390	428	147	109	.....	.....
Taylor	86	4	1	2	2	54	4	14	14	.....	58	68	28	18	.....	.....
Trempealeau	156	8	1	7	2	123	8	18	7	.....	131	141	25	15	.....	.....
Vernon	209	6	3	4	2	176	9	11	3	10	192	189	15	12	2	8
Vilas	25	1	.....	3	1	16	1	3	4	1	17	19	7	5	1	1
Walworth	203	16	7	12	1	170	9	10	14	.....	177	182	26	21	.....	.....
Washburn	57	.....	1	.....	.....	48	3	3	3	.....	51	50	6	6	.....	1
Washington	219	6	.....	3	1	201	4	10	4	.....	205	211	14	8	.....	.....
Waukesha	273	18	6	8	5	226	13	24	7	3	240	250	32	20	1	3
Waupaca	273	20	7	18	3	218	11	31	12	1	230	251	42	22	1	.....
Waushara	129	4	.....	2	2	100	3	9	14	3	106	110	23	16	.....	3
Winnebago	611	38	28	26	20	500	23	56	27	5	525	559	84	49	2	3
Wood	231	17	5	8	6	173	12	34	9	3	187	208	43	21	1	2
Total	20,125	1,198	506	774	497	14,672	876	2,038	2,380	159	15,642	16,795	4,424	3,215	59	115

TABLE NO. 11. SHOWING MARRIAGES REPORTED FROM JAN. 1, 1912, TO DEC. 31, 1912, ARRANGED ACCORDING TO AGE GROUPS.

County.	Total marriages.	Age Grouping.											
		Under 15 years.	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-79	80+	Age not stated.
Adams	53													
Brides		1	16	21	6	2	2	....	1	....	1	2	....	1
Grooms		....	.....	20	12	9	2	2	4	....	....	3	....	1
Ashland	153													
Brides		....	42	63	26	9	3	3	....	2	....	1	....	4
Grooms		....	4	54	47	15	14	10	3	1	1	....	....	4
Barron	196													
Brides		....	54	86	28	12	5	5	2	2	....	....	....	2
Grooms		....	6	77	58	20	17	5	5	3	1	2	....	2
Bayfield	78													
Brides		1	29	31	9	3	2	2	....	1	....	....	....	....
Grooms		....	2	30	29	7	1	3	4	1	1	....	....	....
Brown	468													
Brides		2	85	215	83	31	14	5	4	2	1	5	....	21
Grooms		....	16	177	153	50	26	14	7	3	2	6	....	14
Buffalo	91													
Brides		....	26	40	19	4	.....	....	1	....	....	....	....	1
Grooms		....	.....	28	46	5	5	4	....	1	....	1	....	1
Burnett	56													
Brides		....	14	29	6	2	2	1	1	1	....	....	....	....
Grooms		....	1	20	17	10	5	....	....	....	....	3	....	....
Calumet	116													
Brides		....	14	63	17	9	5	3	....	3	....	1	....	1
Grooms		....	3	31	53	11	8	3	4	....	1	2	....	....
Chippewa	253													
Brides		....	69	111	44	7	8	6	2	4	2	....	....	....
Grooms		....	4	97	86	31	10	7	4	4	5	5	....	....
Clark	198													
Brides		....	58	99	23	8	3	2	1	3	1	....	....	....
Grooms		....	5	72	67	23	15	4	3	7	2	....	....	....
Columbia	222													
Brides		....	42	105	40	12	11	5	2	2	2	....	1	....
Grooms		....	1	86	67	24	18	12	5	3	3	....	3	....
Crawford	155													
Brides		....	37	70	20	12	6	4	4	....	....	2	....	....
Grooms		....	1	64	41	17	15	5	4	3	2	2	....	1
Dane	582													
Brides		3	100	263	126	42	20	8	8	4	2	....	....	6
Grooms		....	11	200	219	70	31	14	12	6	3	9	....	7
Dodge	330													
Brides		....	70	166	49	23	6	10	1	3	2	....	....	....
Grooms		....	2	145	109	34	13	11	7	3	4	2	....	....
Door	125													
Brides		....	26	58	22	8	3	4	....	1	2	....	....	1
Grooms		....	5	47	41	11	8	5	3	1	....	2	1	1
Douglas	392													
Brides		....	86	190	49	30	17	7	6	2	1	....	....	4
Grooms		....	1	167	119	54	19	16	9	2	2	2	....	1
Dunn	206													
Brides		....	41	105	35	11	8	1	2	....	1	1	....	1
Grooms		....	7	76	63	31	15	8	1	1	2	2	....	....
Eau Claire	263													
Brides		....	48	132	47	10	4	10	5	4	1	2	....	....
Grooms		....	4	105	82	28	16	7	6	5	5	5	....	....
Florence	23													
Brides		....	6	8	7	2	.....	....	....	....	....	....	....	....
Grooms		....	2	5	10	4	1	....	....	....	1	....	....	....
Fond du Lac	390													
Brides		....	66	188	86	24	11	4	3	....	3	2	....	3
Grooms		....	5	152	139	44	15	15	11	2	4	2	1	....
Forest	48													
Brides		1	23	15	3	1	2	1	1	1	....	....	....	....
Grooms		....	.....	23	12	5	4	2	....	2	....	....	....	....
Grant	255													
Brides		....	54	110	49	19	8	5	4	1	1	4	....	....
Grooms		....	8	97	88	21	15	8	9	1	2	6	....	....

TABLE NO. 11—Continued. SHOWING MARRIAGES REPORTED FROM JAN. 1, 1912, TO DEC. 31, 1912, ARRANGED ACCORDING TO AGE GROUPS.

County.	Total marriages.	Age Grouping.											
		Under 15 years.	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-79	80+	Age not stated.
Green	160													
Brides		....	36	80	28	6	4	2	2	1	....	1	....	....
Grooms		....	1	74	49	12	13	4	2	3	....	2	....	....
Green Lake	117													
Brides		....	19	61	26	4	2	3	1	....	....	1	....	....
Grooms		....	3	42	45	14	3	5	2	....	....	3	....	....
Iowa	165													
Brides		....	30	67	43	12	4	1	3	1	1	2	....	1
Grooms		....	1	62	57	20	8	6	1	1	4	2	....	3
Iron	72													
Brides		....	20	30	10	6	4	....	....	....	1	1	....	....
Grooms		....	1	26	28	8	3	3	....	1	1	....	....	1
Jackson	93													
Brides		....	34	28	17	8	3	1	1	....	....	1	....	....
Grooms		....	1	33	29	15	4	4	4	1	....	2	....	....
Jefferson	253													
Brides		....	44	119	53	13	9	6	2	4	....	....	....	3
Grooms		....	6	92	82	37	17	7	5	2	2	3	....	....
Juneau	131													
Brides		....	35	59	17	6	8	....	2	1	....	....	....	3
Grooms		....	3	49	42	17	6	3	5	2	....	3	....	1
Kenosha	477													
Brides		....	98	213	88	36	22	8	9	1	1	1	....	....
Grooms		....	4	177	146	66	28	23	17	5	5	6	....	....
Kewaunee	124													
Brides		....	29	62	22	7	2	....	....	....	....	....	....	2
Grooms		....	.....	50	51	17	3	1	1	....	....	....	....	1
La Crosse	407													
Brides		....	89	175	85	22	17	5	7	3	2	2	....	....
Grooms		....	5	153	139	48	29	13	7	5	2	6	....	....
Lafayette	128													
Brides		....	22	61	30	7	1	2	3	....	1	....	....	1
Grooms		....	2	57	33	16	6	8	5	1	....	....	....	....
Langlade	152													
Brides		....	51	61	25	6	5	1	1	....	....	2	....	....
Grooms		....	2	74	49	10	7	7	....	....	....	3	....	....
Lincoln	138													
Brides		....	44	64	17	7	2	2	1	1	....	....	....	....
Grooms		....	3	65	42	15	7	....	3	3	....	....	....	....
Manitowoc	375													
Brides		1	62	219	62	14	2	5	3	4	1	2	....	....
Grooms		....	4	152	151	29	16	5	8	4	2	4	....	....
Marathon	440													
Brides		1	121	208	66	15	14	5	4	2	1	2	....	1
Grooms		....	7	168	148	64	26	8	10	3	3	2	....	1
Marinette	163													
Brides		....	40	81	25	7	2	3	2	1	....	....	....	2
Grooms		....	3	60	60	21	6	2	2	4	1	2	....	2
Marquette	100													
Brides		....	20	58	14	3	1	....	2	....	1	....	....	1
Grooms		....	1	30	44	9	9	2	2	2	....	1	....	....
Milwaukee	5,156													
Brides		1	959	2,445	1,000	321	191	112	6	39	12	7	....	3
Grooms		....	64	2,001	1,721	647	290	181	114	62	28	40	....	8
Monroe	216													
Brides		1	55	103	37	5	7	1	4	....	1	2	....	....
Grooms		....	3	92	78	22	7	6	2	2	....	4	....	....
Oconto	152													
Brides		1	47	59	27	5	2	3	....	3	1	....	....	4
Grooms		....	2	62	52	18	5	4	2	1	1	1	....	4
Oneida	75													
Brides		....	17	38	7	6	1	1	4	....	1	....	....	....
Grooms		....	.....	34	18	10	2	4	1	2	4	....	....	....
Outagamie	3 3													
Brides		....	70	171	58	20	11	8	6	1	1	4	....	3
Grooms		....	5	144	120	36	11	15	4	7	....	6	....	5

TABLE NO. 11—Continued. SHOWING MARRIAGES REPORTED FROM JAN. 1, 1912, TO DEC. 31, 1912, ARRANGED ACCORDING TO AGE GROUPS.

County.	Total marriages.	Age Grouping.												
		Under 15 years.	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-79	80+	Age not stated.
Ozaukee	138													
Brides		....	19	69	32	12	3	....	2	....	....	....	....	1
Grooms		....	.....	52	54	19	6	1	4	1	....	....	....	1
Pepin	39													
Brides		....	10	15	7	5	1	....	....	1	....	....	....	....
Grooms		....	.....	10	11	8	6	1	1	1	....	....	....	1
Pierce	99													
Brides		....	18	54	9	8	3	5	1	....	....	1	....	....
Grooms		....	1	35	36	10	9	5	1	1	....	1	....	....
Polk	113													
Brides		....	30	55	14	5	2	4	2	....	....	....	....	1
Grooms		....	.....	45	34	17	5	4	6	2	....	....	....	....
Portage	276													
Brides		1	88	130	28	11	5	5	....	2	3	2	....	1
Grooms		....	6	146	70	22	10	6	2	3	1	7	....	3
Price	95													
Brides		1	30	33	20	2	3	2	4	....	....	....	....	....
Grooms		....	.....	39	34	6	8	4	2	....	2	....	....	....
Racine	545													
Brides		....	95	261	116	38	14	13	5	1	1	1	....	....
Grooms		....	5	221	187	69	33	7	11	7	1	4	....	....
Richland	148													
Brides		....	45	67	17	9	2	2	1	2	1	....	....	2
Grooms		....	7	70	35	13	10	7	1	2	1	1	....	1
Rock	412													
Brides		....	73	199	71	31	19	9	4	3	1	....	....	2
Grooms		....	12	167	122	46	29	13	12	4	5	2	....	....
Rusk	108													
Brides		....	56	34	11	1	3	1	....	....	1	1	....	....
Grooms		....	4	50	33	13	2	1	1	1	....	3	....	....
St. Croix	452													
Brides		....	78	152	105	58	39	11	4	2	....	2	....	1
Grooms		....	4	136	127	88	40	22	18	7	3	6	....	1
Sauk	304													
Brides		....	64	132	69	23	4	3	2	1	....	3	....	3
Grooms		....	4	118	86	55	14	16	3	3	1	4	....	....
Sawyer	50													
Brides		....	14	18	8	2	2	1	2	1	....	....	....	2
Grooms		....	.....	22	14	5	4	1	1	3	....	....	....	....
Shawano	237													
Brides		....	65	115	37	6	7	2	4	....	....	....	....	1
Grooms		....	6	94	79	28	15	4	5	3	1	1	....	1
Sheboygan	537													
Brides		....	83	306	87	26	18	7	4	1	1	4	....	....
Grooms		....	11	232	173	75	20	10	6	2	3	4	....	1
Taylor	86													
Brides		....	24	42	13	3	2	....	....	2	....	....	....	....
Grooms		....	25	35	17	5	2	....	....	....	2	....	....	....
Trempealeau	156													
Brides		....	37	68	29	10	3	2	5	....	2	....	....	....
Grooms		....	1	54	52	17	14	6	4	5	3	....	....	....
Vernon	209													
Brides		1	56	98	31	9	6	4	....	1	....	....	....	....
Grooms		....	7	88	56	28	13	5	4	3	....	2	....	3
Vilas	25													
Brides		....	13	7	2	1	1	1	....	....	....	....	....	....
Grooms		....	1	12	8	2	1	....	....	1	....	....	....	....
Walworth	203													
Brides		....	35	85	47	14	5	8	5	2	....	2	....	....
Grooms		....	5	82	53	27	13	5	9	3	2	3	1	....
Washburn	57													
Brides		1	23	21	6	1	3	....	1	1	....	....	....	....
Grooms		....	2	23	13	9	4	....	3	2	1	....	....	....
Washington	219													
Brides		....	26	126	41	12	8	2	3	....	1	....	....	....
Grooms		....	1	85	80	28	12	4	5	2	1	1	....	....

TABLE NO. 11.—Concluded. SHOWING MARRIAGES REPORTED FROM JAN. 1, 1912, TO DEC. 31, 1912, ARRANGED ACCORDING TO AGE GROUPS.

County.	Total marriages.	Age Grouping.											
		Under 15 years.	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-79	80+	Age not stated.
Waukesha	273													
Brides	.....	....	51	104	66	22	10	5	3	5	2	2	....	3
Grooms	.....	....	5	88	89	42	19	8	5	8	1	7	....	1
Waupaca	273													
Brides	.....	1	51	140	42	13	4	6	1	4	2	9	....	....
Grooms	.....	....	6	111	81	32	13	7	6	5	1	11	....	....
Waushara	129													
Brides	.....	....	38	57	26	3	1	2	....	1	....	....	....	1
Grooms	.....	....	3	56	43	17	4	2	....	....	2	1	....	1
Winnebago	611													
Brides	.....	....	142	267	106	35	23	17	4	2	5	4	....	6
Grooms	.....	....	18	263	181	61	30	15	19	9	4	10	....	1
Wood	231													
Brides	.....	....	57	113	37	9	4	2	5	2	1	1	....	....
Grooms	.....	....	.....	84	91	25	9	6	9	1	2	4	....	....
Total	20,125													
Brides ...	.....	18	4,269	7,398	3,628	1,195	619	369	233	132	66	80	1	96
Grooms ..	.....	....	343	7,888	6,601	2,442	1,124	626	436	239	131	216	6	73

TABLE NO. 12. SHOWING MARRIAGES REPORTED TO THE STATE BUREAU OF VITAL STATISTICS FROM JAN. 1, 1913, TO DEC. 31, 1913, CLASSIFIED BY COUNTIES AND PLACE OF BIRTH.

Conuty.	Total marriages.	Grooms.		Brides.		Both parties native born.	Groom native, bride foreign.	Groom foreign, bride native.	Both parties foreign born.	Birthplace of one or both unknown.	Native born.		Foreign born.		Unknown.	
		Widowed.	Divorced.	Widowed.	Divorced.						Male.	Female.	Male.	Female.	Male.	Female.
Adams	59	3	.....	2	.....	55	1	2	1	.....	56	57	3	2	.....	.....
Ashland	145	8	2	7	5	95	8	16	24	2	103	111	40	32	2	2
Barron	237	15	1	13	.....	177	9	29	21	1	186	206	50	30	1	1
Bayfield	74	3	1	4	.....	46	2	10	16	.....	48	56	26	18	.....	.....
Brown	440	20	4	12	5	381	16	26	13	4	397	407	39	29	4	4
Buffalo	92	4	.....	2	.....	84	3	3	2	.....	87	87	5	5	.....	.....
Burnett	59	1	1	1	1	42	4	9	4	.....	46	51	13	8	.....	.....
Calumet	104	3	1	3	1	94	.....	4	4	2	94	98	8	4	2	2
Chippewa	262	5	1	11	2	211	9	27	15	.....	220	238	42	24	.....	.....
Clark	263	3	.....	3	1	210	13	26	12	2	223	236	38	25	2	2
Columbia	267	2	3	5	3	226	8	15	18	.....	234	241	33	26	.....	.....
Crawford	134	2	4	4	9	122	.....	6	2	4	122	128	8	2	4	4
Dane	653	24	8	12	12	517	25	52	52	7	542	569	104	77	7	7
Dodge	339	5	2	4	3	279	13	22	24	1	292	301	46	37	1	1
Door	158	5	.....	5	1	141	5	9	3	.....	146	150	12	8	.....	.....
Douglas	404	6	3	9	.....	214	25	68	97	.....	239	282	165	122	.....	.....
Dunn	204	8	2	12	2	172	4	25	3	.....	176	197	28	7	.....	.....
Eau Claire	321	10	1	9	3	267	11	25	12	6	278	292	37	22	6	6
Florence	19	.....	.....	.....	.....	12	3	2	2	.....	14	15	5	4	.....	.....
Fond du Lac	479	8	3	8	3	423	13	28	14	1	436	451	42	27	1	1
Forest	33	.....	.....	.....	.....	32	1	.....	.....	.....	33	32	.....	1	.....	.....
Grant	281	3	3	3	4	263	3	12	1	2	266	275	13	4	2	2
Green	161	8	1	7	.....	118	5	10	27	1	123	128	37	32	1	1
Green Lake	108	1	1	1	.....	92	7	3	6	.....	99	95	9	13	.....	.....
Iowa	157	1	.....	1	.....	136	8	9	4	.....	145	145	12	12	.....	.....
Iron	83	11	3	8	.....	25	4	10	44	.....	29	35	54	48	.....	.....
Jackson	112	2	.....	3	2	99	4	9	.....	.....	105	106	7	6	.....	1
Jefferson	289	7	2	8	4	257	18	7	7	.....	274	264	15	25	.....	.....
Juneau	164	15	7	12	3	143	3	13	5	.....	148	157	16	7	.....	.....
Kenosha	418	23	14	15	23	198	14	41	165	.....	212	239	206	179	.....	.....

Kewaunee	151	3	1	2	2	143	3	4	1	.....	145	147	6	4	.....	.....
La Crosse	432	28	19	25	14	358	25	29	19	1	384	389	48	42	.....	1
Lafayette	156	4	.....	1	2	138	5	9	2	2	143	149	11	7	2	.....
Langlade	136	8	7	8	5	109	4	8	12	3	114	117	22	17	.....	2
Lincoln	86	3	2	3	3	68	5	9	4	.....	73	77	13	9	.....	.....
Manitowoc	427	18	2	16	5	371	9	26	20	1	381	405	46	21	.....	1
Marathon	457	28	8	19	11	364	15	52	26	.....	379	416	78	41	.....	.....
Marinette	192	12	6	11	4	132	11	35	13	1	144	168	48	23	.....	1
Marquette	88	4	.....	4	.....	79	1	5	2	1	81	84	7	3	.....	1
Milwaukee	5,432	388	141	327	165	3,145	254	644	1,362	27	3,403	3,793	2,017	1,620	12	19
Monroe	238	18	3	11	9	210	5	13	4	6	217	224	17	9	4	5
Oconto	144	13	2	7	2	108	6	16	14	.....	115	126	29	18	.....	.....
Oneida	69	10	1	4	2	44	8	7	6	4	56	51	13	14	.....	4
Outagamie	420	36	7	29	7	347	11	36	25	1	359	383	61	36	.....	1
Ozaukee	147	5	2	2	2	121	5	8	12	1	126	130	20	17	1	.....
Pepin	58	2	.....	2	1	53	3	1	1	.....	56	54	2	4	.....	.....
Pierce	104	6	.....	4	1	87	3	8	5	1	90	96	13	8	1	.....
Polk	126	11	6	9	6	84	7	21	13	1	91	106	34	20	1	.....
Portage	281	31	9	27	5	228	9	33	9	2	238	261	42	18	1	2
Price	74	4	2	6	.....	38	6	12	17	1	44	51	29	23	1	.....
Racine	482	20	14	21	13	256	30	58	130	8	286	314	196	161	.....	7
Richland	150	13	2	9	5	145	1	2	.....	2	147	148	2	1	1	1
Rock	472	24	21	17	16	381	16	33	41	1	398	415	74	56	.....	1
Rusk	87	13	1	8	4	66	4	8	9	.....	70	74	17	13	.....	.....
St. Croix	399	29	32	14	52	312	21	39	26	1	333	352	65	47	1	.....
Sauk	267	11	12	10	6	234	6	15	9	3	240	250	24	16	3	1
Sawyer	33	6	4	3	5	27	1	5	.....	.....	28	32	5	1	.....	.....
Shawano	249	13	4	13	4	204	12	21	12	.....	216	225	33	24	.....	.....
Sheboygan	546	28	11	28	8	390	29	43	83	1	421	440	125	105	.....	1
Taylor	110	4	1	3	5	65	7	19	18	1	72	85	37	25	1	.....
Trempealeau	173	9	1	5	1	147	5	16	5	.....	152	163	21	10	.....	.....
Vernon	230	18	4	8	11	202	6	18	2	2	209	221	20	8	1	1
Vilas	16	1	.....	3	.....	9	.....	2	5	.....	9	11	7	5	.....	.....
Walworth	216	8	8	9	4	180	7	18	10	1	187	199	28	17	1	.....
Washburn	84	5	2	7	2	68	2	9	5	.....	70	77	14	7	.....	.....
Washington	192	9	1	5	.....	171	3	11	6	1	175	183	17	8	.....	1
Waukesha	307	17	9	19	7	252	13	31	9	2	265	282	42	23	.....	2
Waupaca	262	20	6	16	8	226	5	19	9	3	231	246	28	14	3	2
Waushara	109	11	2	5	5	100	.....	5	3	1	100	106	8	3	1	.....
Winnebago	654	51	22	33	25	522	33	59	38	2	555	583	97	71	2	.....
Wood	277	18	5	12	11	218	7	36	13	3	227	254	50	20	.....	3
Total	21,052	1,166	448	949	525	15,533	842	1,961	2,598	118	16,403	17,536	4,579	3,425	70	91

TABLE NO. 13.—SHOWING MARRIAGES REPORTED FROM JAN. 1, 1913, TO DEC, 31, 1913, ARRANGED ACCORDING TO AGE GROUPS.

County.	Total marriages.	Age Grouping.											
		Under 15 years.	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-79	80+	Age not stated.
Adams	59													
Brides		....	27	17	8	4	3	....	....	....	....	....	....	....
Grooms		....	3	24	16	10	5	1	....	....	....	....	....	....
Ashland	145													
Brides		1	32	66	28	7	4	1	3	....	....	1	....	2
Grooms		....	3	52	51	24	3	3	4	....	1	2	....	2
Barron	237													
Brides		....	76	92	43	10	3	4	2	6	1	....	....	....
Grooms		....	9	88	85	23	10	6	4	5	2	4	....	1
Bayfield	74													
Brides		....	23	32	7	1	2	2	3	1	1	....	....	2
Grooms		....	1	31	19	6	4	2	4	2	1	2	....	2
Brown	440													
Brides		....	98	193	92	31	6	3	4	5	2	1	....	5
Grooms		....	12	198	123	59	13	11	6	4	3	5	....	6
Buffalo	92													
Brides		....	16	48	15	6	4	1	1	....	....	1	....	....
Grooms		....	2	38	18	20	6	1	3	2	....	2	....	....
Burnett	59													
Brides		....	20	22	8	6	2	....	....	1	....	....	....	....
Grooms		....	.....	15	20	13	5	4	....	1	....	1	....	....
Calumet	104													
Brides		....	17	59	21	2	2	....	3	....	....	....	....	....
Grooms		....	1	52	33	7	3	4	4	....	....	....	....	....
Chippewa	262													
Brides		....	63	122	46	11	9	2	4	2	....	3	....	....
Grooms		....	10	97	92	37	6	3	9	2	2	4	....	....
Clark	263													
Brides		1	95	107	40	12	2	1	2	1	1	....	....	1
Grooms		....	7	108	86	44	8	6	1	1	1	....	....	1
Columbia	267													
Brides		....	43	127	52	15	9	6	6	2	6	....	....	1
Grooms		....	1	98	83	37	20	8	10	5	5	....	....	....
Crawford	134													
Brides		....	30	57	18	14	4	4	5	1	....	....	....	1
Grooms		....	2	51	32	20	9	6	8	4	2	....	....	....
Dane	653													
Brides		....	115	298	144	44	26	8	5	4	2	1	....	6
Grooms		....	9	249	217	87	35	20	14	8	5	3	....	6
Dodge	339													
Brides		....	80	159	71	14	9	1	3	....	....	2	....	....
Grooms		....	4	140	128	29	17	8	8	....	3	1	....	1
Door	158													
Brides		....	33	80	26	8	3	3	3	1	....	1	....	....
Grooms		....	5	57	57	17	10	4	2	3	2	1	....	....
Douglas	404													
Brides		....	90	164	78	24	22	15	7	2	1	1	....	....
Grooms		....	1	127	143	62	27	19	9	8	2	6	....	....
Dunn	204													
Brides		....	62	77	37	11	10	2	2	1	....	1	....	1
Grooms		....	4	82	64	23	12	9	5	1	1	2	....	1
Eau Claire	321													
Brides		....	65	145	78	15	8	3	2	2	2	....	....	1
Grooms		....	5	121	113	45	20	4	3	3	1	5	1	....
Florence	19													
Brides		....	3	11	3	.....	1	....	....	1	....	....	....	....
Grooms		....	.....	8	8	1	.....	1	1	....	....	....	....	....
Fond du Lac	479													
Brides		....	92	209	109	36	11	10	6	3	....	3	....	....
Grooms		....	6	184	151	67	33	11	6	12	1	7	....	1
Forest	33													
Brides		....	13	13	3	3	1	....	....	....	....	....	....	....
Grooms		....	2	18	9	2	1	1	....	....	....	....	....	....
Grant	281													
Brides		....	70	129	58	7	8	2	2	1	2	....	1	1
Grooms		....	9	121	96	28	10	9	2	1	2	3	....	....

TABLE NO. 13—Continued. SHOWING MARRIAGES REPORTED FROM JAN. 1, 1913, TO DEC. 31, 1913, ARRANGED ACCORDING TO AGE GROUPS.

County.	Total marriages.	Age grouping.											
		Under 15 years.	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-79	80+	Age not stated.
Green	161													
Brides		....	45	78	20	8	4	2	2	1	....	1	....	....
Grooms		....	2	72	55	13	8	3	1	2	2	2	....	1
Green Lake	108													
Brides		....	23	51	22	6	1	....	1	1	....	3	....	....
Grooms		....	1	39	44	9	6	2	2	1	....	4	....	....
Iowa	157													
Brides		....	26	82	31	11	.....	1	1	....	....	3	....	2
Grooms		....	4	61	50	24	4	4	3	2	3	....	....	2
Iron	83													
Brides		....	24	37	9	2	3	2	1	3	....	....	....	2
Grooms		....	.....	27	27	17	4	4	....	2	....	....	1	1
Jackson	112													
Brides		....	31	50	20	5	1	3	2	....	....	....	....	....
Grooms		....	2	46	37	14	7	....	1	3	1	....	1	....
Jefferson	289													
Brides		....	55	137	61	18	5	3	1	2	3	....	....	4
Grooms		....	8	132	89	24	17	4	4	3	....	3	....	5
Juneau	164													
Brides		....	36	79	22	11	5	2	2	3	....	1	....	3
Grooms		....	11	51	57	21	6	5	3	3	2	3	....	2
Kenosha	418													
Brides		....	97	187	79	28	10	6	3	6	....	1	....	1
Grooms		....	10	160	136	49	28	19	6	4	4	2	....	....
Kewaunee	151													
Brides		....	45	80	20	5	1	....	....	....	....	....	....	....
Grooms		....	4	86	40	13	5	1	1	....	....	....	....	1
La Crosse	432													
Brides		....	85	176	104	25	15	10	5	7	2	3	....	....
Grooms		....	3	165	142	51	25	16	15	5	4	5	....	1
Lafayette	156													
Brides		....	30	80	24	13	8	....	....	....	1	....	....	....
Grooms		....	3	63	52	17	13	5	1	1	....	1	....	....
Langlade	136													
Brides		....	37	59	24	8	3	2	2	....	1	....	....	....
Grooms		....	5	63	34	19	7	3	2	2	....	....	....	1
Lincoln	86												....	....
Brides		....	23	47	9	1	3	2	1	....	....	....	....	....
Grooms		....	2	34	28	13	4	4	....	....	1	....	....	....
Manitowoc	427													
Brides		....	88	203	101	16	9	4	4	1	....	....	....	1
Grooms		....	4	173	156	47	26	3	10	3	3	1	....	1
Marathon	457													
Brides		....	137	206	74	23	4	5	3	1	1	1	....	2
Grooms		....	9	175	167	61	18	10	8	6	1	2	....	....
Marinette	192													
Brides		....	31	109	27	10	5	6	1	2	....	1	....	....
Grooms		....	4	63	75	24	10	7	3	2	1	2	....	1
Marquette	88													
Brides		....	19	47	16	2	2	1	1	....	....	....	....	....
Grooms		....	3	37	36	4	5	2	1	....	....	....	....	....
Milwaukee	5,432													
Brides		....	1,127	2,553	991	330	184	88	76	39	16	9	....	19
Grooms		....	83	2,179	1,828	653	288	142	92	75	45	41	....	6
Monroe	238													
Brides		....	60	109	48	7	8	2	1	....	2	....	....	1
Grooms		....	4	103	78	23	10	7	6	2	2	2	....	1
Oconto	144													
Brides		....	56	61	12	5	2	1	3	1	....	1	....	2
Grooms		....	3	64	43	19	6	3	....	2	2	2	....	....
Oneida	69													
Brides		....	23	27	10	4	.....	....	1	3	....	1	....	....
Grooms		....	4	27	14	11	6	....	1	3	1	1	....	1
Outagamie	420													
Brides		....	89	194	68	27	15	5	5	7	2	1	....	7
Grooms		....	7	167	140	39	24	10	4	10	4	8	....	7

TABLE NO. 13—Continued. SHOWING MARRIAGES REPORTED FROM JAN. 1, 1913, TO DEC. 31, 1913, ARRANGED ACCORDING TO AGE GROUPS.

County.	Total marriages.	Age Grouping.											
		Under 15 yrs.	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-79	80+	Age not stated.
Ozaukee	147													
Brides		....	26	79	26	7	4	....	2	2	....	1	....	....
Grooms		....	1	61	55	17	4	3	1	2	....	3	....	....
Pepin	58													
Brides		....	24	21	9	1	1	....	....	1	....	1	....	....
Grooms		....	1	22	23	7	3	1	....	....	....	1	....	....
Pierce	104													
Brides		....	22	42	23	10	1	1	1	1	....	3	....	....
Grooms		....	1	38	35	11	8	3	2	3	1	2	....	....
Polk	126													
Brides		....	27	55	24	11	3	3	....	1	1	1	....	....
Grooms		....	1	38	41	18	12	4	6	2	2	1	....	1
Portage	281													
Brides		....	86	125	29	14	8	4	5	4	4	1	....	1
Grooms		....	6	117	84	29	19	5	6	4	5	6	....	....
Price	74													
Brides		....	24	31	14	1	.....	1	1	1	1	....	....	....
Grooms		....	.....	29	27	10	4	....	1	....	1	2	....	....
Racine	482													
Brides		....	83	216	122	30	18	6	3	1	....	1	....	2
Grooms		....	.....	194	158	75	29	9	11	2	2	2	....	....
Richland	150													
Brides		....	43	64	20	7	3	4	2	2	2	2	....	1
Grooms		....	6	62	43	19	2	8	2	2	....	4	1	1
Rock	472													
Brides		....	105	202	98	34	15	8	4	2	....	2	....	2
Grooms		....	14	184	153	61	28	15	4	5	4	4	....	....
Rusk	87													
Brides		....	33	37	6	2	2	2	2	1	....	2	....	....
Grooms		....	6	34	18	13	6	3	....	....	2	4	....	1
St. Croix	399													
Brides		....	66	170	86	43	18	10	3	3	....	....	....	....
Grooms		....	2	112	137	68	30	25	17	5	2	1	....	....
Sauk	267													
Brides		....	49	135	42	16	13	3	1	1	1	3	....	3
Grooms		....	6	86	96	39	13	12	3	3	4	3	....	2
Sawyer	33													
Brides		....	7	12	4	2	1	4	....	2	....	1	....	....
Grooms		....	.....	10	7	3	5	1	5	1	....	....	1	....
Shawano	249													
Brides		....	69	116	35	12	10	1	....	3	1	1	....	1
Grooms		....	5	103	99	20	9	3	1	3	2	4	....	....
Sheboygan	546													
Brides		....	129	281	84	22	13	7	5	1	2	1	....	1
Grooms		....	12	253	179	45	26	11	5	8	3	3	1	....
Taylor	110													
Brides		....	35	43	20	4	2	2	3	....	....	....	....	1
Grooms		....	1	44	39	11	8	2	3	2	....	....	....	....
Trempe leau	173													
Brides		....	37	84	35	13	3	1	....	....	....	....	....	....
Grooms		....	1	66	58	26	10	10	1	1	....	....	....	....
Vernon	230													
Brides		....	67	101	32	8	9	8	1	2	....	....	....	2
Grooms		....	4	104	57	26	15	8	7	4	2	3	....	....
Vilas	16													
Brides		....	7	4	2	.....	1	1	....	....	....	1	....	....
Grooms		....	.....	8	3	2	1	....	1	....	....	1	....	....
Walworth	216													
Brides		....	33	111	40	17	5	3	4	....	2	1	....	....
Grooms		....	1	92	76	22	10	6	3	2	2	2	....	....
Washburn	84													
Brides		....	36	29	8	4	1	1	2	1	....	2	....	....
Grooms		....	6	32	25	11	2	....	3	2	1	2	....	....
Washington	192													
Brides		....	32	110	29	9	4	4	2	....	1	1	....	....
Grooms		....	2	78	71	24	7	6	....	2	....	2	....	....

TABLE NO. 12—Concluded. SHOWING MARRIAGES REPORTED FROM JAN. 1, 1913, TO DEC. 31, 1913, ARRANGED ACCORDING TO AGE GROUPS.

County.	Total marriages.	Age Grouping.												
		Under 15 yrs.	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-79	80+	Age not stated.
Waukesha	307													
Brides		....	38	144	76	23	11	6	3	3	1	2	....	....
Grooms		....	5	116	106	31	16	16	6	4	3	4	....	....
Waupaca	262													
Brides		....	74	111	40	13	9	6	....	4	3	2	....	....
Grooms		....	2	108	85	27	12	10	7	4	....	6	1	....
Waushara	109													
Brides		....	38	44	11	9	2	3	1	1	....	....	....	....
Grooms		....	3	40	36	13	4	4	5	3	1	....	....	....
Winnebago	654													
Brides		....	121	309	129	26	27	11	7	7	6	5	....	6
Grooms		....	24	262	196	76	30	21	11	11	7	10	....	6
Wood	277													
Brides		....	69	123	56	9	3	7	2	4	....	3	....	1
Grooms		....	6	110	100	33	9	3	1	3	3	9	....	....
Total	21,052													
Brides		2	4,730	9,678	3,877	1,193	624	320	233	159	71	78	1	86
Grooms		....	388	8,349	6,979	2,563	1,106	584	379	270	157	207	7	63

DIVORCES.

During the year ending Sept. 30, 1912, there were reported to the State Bureau of Vital Statistics 1,615 divorces; for 1913, 1,391 divorces. The number of marriages reported for 1912 was 20,125, giving a divorce rate per thousand marriages of 80.2. Marriages reported for 1913, 21,052; rate 66.0. A comparison of rates for the last five years shows a rate of 82.5 in 1909; 64.1 in 1910; 68.5 in 1911; 80.2 in 1912 and 66.0 in 1913. Our rate in the United States is twice that of Switzerland, thrice that of France, five times that of Germany and many times that of England and Canada.

We find the wife to be the plaintiff in more than half the divorce proceedings, and in about one-third of the cases to have had a gainful occupation. The inference is that women having a gainful occupation to which they may return more readily seek divorce than those who have no gainful occupation. Prof. Ross in his recent book entitled "Changing America" considers it safe to say that the majority of divorces would not be sought but for the access of women to the industrial field, advancing in substantiation of this statement the difference between the North and South in this matter, hinging on the difference in industrial opportunity for women in the two sections.

Comparatively few cases were contested. Alimony was granted in about one-third of the cases.

Studying the table with reference to the number of children in the family we find that the majority of divorces are granted to couples having no children, showing the tendency of children to hold the parties together. The greater number of divorces are secured by couples who have lived together from one to four, or five to nine, years.

In the great majority of cases the parties are native born and the marriage occurred in Wisconsin, although for 1912 we find the plaintiff to be foreign born in 331 cases and for 1913 in 328 cases. Ninety-five of the couples seeking divorce in 1912 were married outside of the state and 84 in 1913.

The principal causes for which divorces were granted were adultery, 59 in 1912, 50 in 1913; cruelty, 552 in 1912, 520 in 1913;

desertion, 558 in 1912, 454 in 1913; drunkenness, 162 in 1912, 117 in 1913; nonsupport, 214 in 1912, 181 in 1913.

In a paper given before the Fifteenth International Congress on Hygiene and Demography, the Rev. Samuel Dike, L. L. D., secretary of the National League for the Protection of the Family, made a strong plea for a more extended investigation into the real cause of divorce, saying among other things, "It is well known that the technical grounds on which divorces are granted are often very different from the real reasons for which they are sought. Then not only psychological conditions leading to incompatibility but physiological ones, especially those due to sex, are both frequent and powerful elements in the problem. Unwillingness to have children, or even to accept the duties of sex, are doubtless causes that operate very frequently. Especially does the influence of sexual vice on divorce need investigating. But this and some of the other factors in the problem are generally carefully concealed from the courts and of course escape record for obvious reasons. Many of the other points do not come within the range of judicial proceedings as these are now conducted.

Then, further, the influence of property, an institution which has grown up and which exists in the closest relation with the institution of the family, on divorce needs much attention. Inadequate wages, innutritious or badly cooked food, ambition for dress and for those social pleasures which money will buy, the distraction of social life among the rich, quarrels over the distribution of property in later married life, all tell more or less on the prevalence of divorce and should therefore be studied statistically in order that their size and influence be seen so far as possible. So, too, notice needs to be taken of the parallelism, where it may exist, of the movement of divorce to that of financial conditions and its relation to pauperism, crime and insanity. The number of children of the divorced in reform schools and other similar institutions needs to be known. The money cost of divorce, both direct and indirect, ought to be ascertained. In other words, all the varied and complex causes and conditions that enter into the problem should be brought, so far as they can be, within our reach by the statistician."

TABLE NO. 14. SHOWING DIVORCES FROM CERTAIN CAUSES ARRANGED BY COUNTIES AND SEX OF PLAINTIFF FROM OCTOBER 1, 1911 TO SEPT. 30, 1912.

County.	All causes.		Adultery.		Cruelty.		Desertion.		Drunkenness.		Non-support.		Cases pending.	Decree denied.
	Granted to husband.	Granted to wife.	Granted to husband.	Granted to wife.	Granted to husband.	Granted to wife	Granted to husband.	Granted to wife.	Granted to husband.	Granted to wife.	Granted to husband.	Granted to wife.		
Adams	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	....	....
Ashland	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	....	....
Barron	5	1	.....	.....	1	.....	4	.....	.....	1	.....	.....	....	....
Bayfield	1	4	.....	.....	.....	1	1	2	.....	.....	.....	.....	....	....
Brown	6	18	.....	.....	2	4	4	5	.....	4	.....	5	....	....
Buffalo	1	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	....	....
Burnett	2	5	.....	.....	.....	1	2	3	.....	.....	.....	.....	....	....
Calumet	....	2	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	....	....
Chippewa	2	3	.....	.....	.....	1	2	2	.....	.....	.....	.....	....	....
Clark	1	13	.....	1	.....	7	1	2	.....	1	.....	2	....	....
Columbia	3	9	.....	.....	.....	2	2	3	.....	2	.....	1	....	....
Crawford	1	6	.....	.....	.....	2	1	1	.....	3	.....	.....	....	....
Dane	5	56	1	.....	1	25	5	18	.....	8	.....	2	....	....
Dodge	6	17	1	.....	2	2	2	6	1	6	.....	3	....	1
Door	3	8	.....	1	2	5	1	2	.....	.....	.....	.....	....	....
Douglas	9	35	1	2	1	5	5	4	2	9	.....	14	....	....
Dunn	....	1	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	....	....
Eau Claire	3	19	.....	.....	1	5	3	10	.....	.....	.....	2	....	....
Florence	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	....	....
Fond du Lac	10	36	.....	.....	1	16	7	12	.....	6	.....	2	....	1
Forest	....	3	.....	.....	.....	.....	.....	2	.....	1	.....	.....	....	....
Grant	4	27	1	1	.....	7	4	9	.....	3	.....	6	....	....
Green	....	4	.....	.....	.....	2	.....	.....	.....	1	.....	1	....	....
Green Lake	1	3	1	.....	.....	3	.....	.....	.....	.....	.....	.....	....	....
Iowa	....	6	.....	.....	.....	4	.....	1	.....	1	.....	.....	....	....
Iron	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	....	....
Jackson	3	1	.....	.....	.....	.....	3	1	.....	.....	.....	.....	....	....
Jefferson	3	14	.....	.....	.....	7	3	2	.....	1	.....	1	....	....
Juneau	1	9	.....	.....	1	2	.....	4	.....	2	.....	1	....	....
Kenosha	11	26	4	.....	4	5	4	8	.....	1	.....	8	....	....
Kewaunee	1	3	.....	.....	.....	1	1	2	.....	.....	.....	.....	....	....
La Crosse	6	32	2	3	2	6	2	10	.....	4	.....	7	....	....
Lafayette	3	2	1	.....	1	.....	1	1	.....	1	.....	.....	....	....
Langlade	7	5	2	.....	4	4	1	1	.....	.....	.....	.....	....	....
Lincoln	....	6	.....	.....	.....	3	.....	2	.....	1	.....	.....	....	....
Manitowoc	1	14	1	.....	.....	5	.....	6	.....	2	.....	1	....	....
Marathon	5	28	.....	.....	1	18	4	4	.....	3	.....	2	....	....
Marinette	3	14	2	.....	1	5	.....	3	.....	3	.....	2	....	....
Marquette	....	2	.....	1	.....	.....	.....	.....	.....	.....	.....	1	....	....
Milwaukee	109	432	11	6	18	127	54	131	4	58	.....	105	2	1
Monroe	1	7	.....	.....	.....	1	1	2	.....	3	.....	1	....	....
Oconto	2	6	.....	.....	1	4	1	1	.....	.....	.....	1	....	1
Oneida	1	7	.....	.....	1	1	.....	3	.....	1	.....	1	....	....
Outagamie	5	14	.....	.....	2	6	2	2	.....	4	.....	.....	....	....
Ozaukee	1	6	.....	.....	.....	2	.....	2	.....	1	.....	1	....	....
Pepin	1	1	.....	.....	.....	1	1	.....	.....	.....	.....	.....	....	....
Pierce	2	5	.....	.....	.....	1	1	3	.....	.....	.....	2	....	....
Polk	2	6	.....	.....	.....	3	2	1	.....	.....	.....	2	....	....
Portage	1	15	.....	.....	.....	12	1	.....	.....	.....	.....	3	....	....
Price	1	2	.....	.....	.....	1	1	1	.....	.....	.....	.....	....	....
Racine	19	48	2	.....	6	24	10	13	.....	1	.....	7	....	5
Richland	1	16	.....	1	.....	4	2	3	.....	2	.....	5	....	....
Rock	9	41	1	4	2	18	6	12	1	1	.....	2	....	2
Rusk	3	4	1	....	.....	.....	2	2	.....	.....	.....	1	....	....
St. Croix	2	12	.....	.....	.....	3	2	3	.....	4	.....	2	....	1

TABLE NO. 14—Concluded. SHOWING DIVORCES FROM CERTAIN CAUSES ARRANGED BY COUNTIES AND SEX OF PLAINTIFF FROM OCTOBER 1, 1911 TO SEPT. 30, 1912.

County.	All causes.		Adultery.		Cruelty.		Desertion.		Drunkenness.		Non-support.		Cases pending.	Decree denied.
	Granted to husband.	Granted to wife.	Granted to husband.	Granted to wife.	Granted to husband.	Granted to wife.	Granted to husband.	Granted to wife.	Granted to husband.	Granted to wife.	Granted to husband.	Granted to wife.		
Sauk	7	23	1	.....	2	12	4	7	.....	3	.....	.....	....	....
Sawyer	2	2	.....	.....	1	1	.....	.....	.....	.....	.....	.....	....	1
Shawano	3	9	.....	.....	2	5	1	4	.....	.....	.....	.....	....	....
Sheboygan	6	7	1	.....	1	3	3	2	.....	1	.....	.....	....	....
Taylor	4	8	.....	.....	.....	4	3	3	.....	.....	.....	1	....	....
Trempealeau	....	1	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	....	....
Vernon	4	12	.....	1	1	3	2	5	1	2	.....	.....	....	....
Vilas	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	....	....
Walworth	7	16	.....	.....	2	7	5	6	.....	2	.....	1	....	....
Washburn	1	5	.....	.....	.....	2	1	2	.....	.....	.....	1	....	....
Washington	....	1	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	....	....
Waukesha	9	18	1	.....	5	7	2	9	.....	.....	.....	2	....	....
Waupaca	7	22	.....	.....	6	10	1	5	.....	4	.....	3	....	....
Waushara	3	9	.....	1	1	2	2	5	.....	1	.....	.....	....	....
Winnebago	19	70	.....	1	12	38	9	17	.....	.....	.....	11	....	....
Wood	3	16	1	.....	.....	11	1	3	.....	.....	.....	1	....	....
Total	342	1,273	36	23	88	464	184	374	9	153	.....	214	2	13

TABLE NO. 15. SHOWING DIVORCES FROM EACH CAUSE TABULATED BY COUNTIES FROM OCT. 1, 1911, TO SEPT. 30, 1912.

County.	Adultery.				Bigamy.	Cruelty.				Desertion.			Drunkenness.		Fraud in marriage	Insanity.	Imprisonment.	Impotency.	Nonsupport.	Refusal to cohabit.	Voluntary separation.	Other causes or cause not stated.	Cases pending.	Decree denied.
	Adultery.	Adultery and cruelty.	Adultery, cruelty and nonsupport.	Adultery and desertion.		Cruel and inhuman treatment.	Cruelty and desertion.	Cruelty, desertion and drunkenness.	Cruelty, desertion and nonsupport.	Desertion.	Desertion and drunkenness.	Desertion and nonsupport.	Drunkenness.	Drunkenness and nonsupport.										
Adams																								
Ashland																								
Barron						1				4			1											
Bayfield						1				2		1					1							
Brown						5			1	8		1	3	1					5					
Buffalo										1														
Burnett						1				5												1		
Calumet						2																		
Chippewa						1				3		1												
Clark	1					7				3			1						2					
Columbia						1		1		2		3		2					1			2		
Crawford						2				2			3											
Dane	1					19	1	2	4	21		2	4	4					2		1			
Dodge	1					4				8			5	2					3					1
Door	1					4	2		1	2		1												
Douglas	1	1		1		6				7	2		4	7					14			1		
Dunn												1												
Eau Claire						6				6		7					1		2					
Florence																								
Fond du Lac						16	1			17	1	1	5	1	1				2			1		1
Forest										1	1			1										
Grant	1		1			7				6		7	1	2					6					
Green						2							1						1					
Green Lake				1		3																		
Iowa						4				1			1											
Iron																								
Jackson										4														
Jefferson						7				5			1		1		1		1		1			
Juneau						3				4			2						1					
Kenosha	4				1	8	1			6		6	1						8			2		

Kewaunee						1				3														
La Crosse	2	1	1	1	1	8				7		5	2	2					7		1			
Lafayette	1						1			2			1											
Langlade	2					8				2														
Lincoln								1	2	1		1		1										
Manitowoc	1					5				5		1		2					1					
Marathon						19				7		1	3						2			1		
Marinette	2					6				1		2	2	1	1				2					
Marquette			1																1					
Milwaukee	9	2	2	4	4	141	4			119	3	63	30	32	3		2	1	105		14	3	2	1
Monroe						1				2		1	2	1					1					
Oconto						5				2									1					1
Oneida					1	2				1		2	1						1					
Outagamie						8				2	1	1	3	1	1		1				1			
Ozaukee						2				2			1						1		1			
Pepin						1				1														
Pierce						1				2		2							2					
Polk						2	1			3									2					
Portage						12				1									3					
Price						1				2														
Racine	2					29	1			16		7		1					7		3	1		5
Richland	1					4				5			1	1					5					
Rock	1	1	3		1	13	1	2	4	13		5	1	1					2		1	1		2
Rusk				1						4							1		1					
St. Croix						3				4		1	4						2					1
Sauk	1					14				10		1	3									1		
Sawyer						2																2		1
Shawano						7				4		1												
Sheboygan	1					4				5			1									2		
Taylor						4				5		1							1		1			
Trempealeau						1																		
Vernon	1					4				7			3									1		
Vilas																								
Walworth						9				10		1	1	1					1					
Washburn									2	3									1					
Washington													1											
Waukesha	1					11	1			6		5					1		2					
Waupaca						16				5		1	2	2					3					
Waushara	1					3				7			1											
Winnebago	1					50				25		1							11		1			
Wood	1					11				4									1		2			
Total	38	5	8	8	8	518	14	6	14	416	8	134	96	66	7		8	1	214		27	19	2	13

TABLE NO. 16.—SHOWING DIVORCES IN WISCONSIN FROM OCT. 1, 1911, TO SEPT. 30, 1912, ARRANGED ACCORDING TO CAUSE, SEX, NATIVITY, PLACE OF MARRIAGE, NUMBER OF CHILDREN AND DURATION OF MARRIAGE.

County.	Sex of complainant.	No. of divorces.	Nativity of plaintiff.			Nativity of defendant.		
			Native born.	Foreign born.	Unknown.	Native born.	Foreign born.	Unknown.
Adultery	Total	38	18	11	9	20	6	12
	Male	30	15	10	5	4	.....	4
	Female	8	3	1	4	16	6	8
Adultery and cruelty	Total	5	3	2	.....	3	1	1
	Male	1	.....	1	.....	3	.....	1
	Female	4	3	1	.....	.....	1	.....
Adultery, cruelty and nonsupport	Total	8	6	2	.....	6	2	.....
	Male	.....	.....	.....	.....	6	2	.....
	Female	8	6	2	.....	.....	.....	.....
Adultery and desertion	Total	8	3	3	2	4	1	3
	Male	5	1	2	2	2	.....	1
	Female	3	2	1	.....	2	1	2
Bigamy	Total	8	7	.....	1	4	1	3
	Male	1	1	.....	.....	4	.....	3
	Female	7	6	.....	1	.....	1	1
Cruel and inhuman treatment	Total	518	290	107	121	265	121	132
	Male	84	46	17	21	218	106	110
	Female	434	244	90	100	47	15	22
Cruelty and desertion	Total	14	8	4	2	9	3	2
	Male	4	2	1	1	7	2	1
	Female	10	6	3	1	2	1	1
Cruelty, desertion and drunkenness	Total	6	4	1	1	3	1	2
	Male	.....	.....	.....	.....	3	1	2
	Female	6	4	1	1	.....	.....	.....
Cruelty, desertion and nonsupport	Total	14	12	2	.....	10	1	3
	Male	.....	.....	.....	.....	11	1	3
	Female	14	12	2	.....	.....	.....	.....
Desertion	Total	416	229	94	93	240	74	102
	Male	183	93	53	37	137	34	62
	Female	233	136	41	56	103	40	40
Desertion and drunkenness	Total	8	6	1	1	4	3	1
	Male	1	1	.....	.....	3	3	1
	Female	7	5	1	1	1	.....	.....
Desertion and nonsupport	Total	134	86	29	19	78	31	25
	Male	.....	.....	.....	.....	78	31	25
	Female	134	86	29	19	.....	.....	.....
Drunkenness	Total	96	65	17	14	60	20	16
	Male	9	7	2	.....	53	18	16
	Female	87	58	15	14	7	2	.....
Drunkenness and nonsupport	Total	66	45	15	6	42	17	7
	Male	.....	.....	.....	.....	42	17	7
	Female	66	45	15	6	.....	.....	.....
Fraud in marriage	Total	7	3	2	2	4	.....	3
	Male	2	.....	2	.....	3	.....	2
	Female	5	3	.....	2	1	.....	1
Insanity	Total	.....	.....	.....	.....	.....	.....	.....
	Male	.....	.....	.....	.....	.....	.....	.....
	Female	.....	.....	.....	.....	.....	.....	.....

Table No. 16—Continued. SHOWING DIVORCES IN WISCONSIN FROM OCT. 1, 1911, TO SEPT. 30, 1912, ARRANGED ACCORDING TO CAUSE, SEX, NATIVITY, PLACE OF MARRIAGE, NUMBER OF CHILDREN, AND DURATION OF MARRIAGE.

County.	Sex of complainant.	No. of divorces.	Nativity of plaintiff.			Nativity of defendant.		
			Native born.	Foreign born.	Unknown	Native born.	Foreign born.	Unknown
Imprisonment	Total	8	4	3	1	4	3	1
	Male	.....	.....	.....	.....	4	3	1
	Female	8	4	3	1	.....	.....	.....
Impotency	Total	1	1	.....	.....	1	.....	.....
	Male	.....	.....	.....	.....	1	.....	.....
	Female	1	1	.....	.....	.....	.....	.....
Nonsupport	Total	214	163	25	26	159	33	22
	Male	.....	.....	.....	.....	159	33	22
	Female	214	163	25	26	.....	.....	.....
Refusal to cohabit	Total	.....	.....	.....	.....	.....	.....	.....
	Male	.....	.....	.....	.....	.....	.....	.....
	Female	.....	.....	.....	.....	.....	.....	.....
Voluntary separation	Total	27	17	8	2	17	6	4
	Male	15	8	6	1	9	1	2
	Female	12	9	2	1	8	5	2
Other causes or cause not stated	Total	19	7	5	7	8	4	7
	Male	8	1	2	5	7	2	2
	Female	11	6	3	2	1	2	5
	Total	1,615	977	331	307	941	328	346

TABLE NO. 16—Concluded. SHOWING DIVORCES IN WISCONSIN FROM OCT. 1, 1911, TO SEPT. 30, 1912, ARRANGED ACCORDING TO CAUSE, SEX, NATIVITY, PLACE OF MARRIAGE, NUMBER OF CHILDREN AND DURATION OF MARRIAGE.

Causes.	Place of marriage.				Gainful occupation of plaintiff.	Case contested.	Alimony.		Number of children in family.											Duration of marriage.							
	Wisconsin.	United States.	Foreign countries.	Unknown.			Alimony asked.	Alimony granted.	No children.	1	2	3	4	5	6	7	8	9	10+	Not stated.	Under six months.	Under one year.	1—4 years.	5—9 years.	10—19 years.	20—29 years.	30+	Not stated.
Adultery	25	9	4	....	29	4	6	5	25	4	3	3	....	1	1	....	1	....	....	....	2	2	12	14	6	2	....	....
Adultery and cruelty	2	1	2	....	2	....	2	2	2	1	1	....	....	1	....	....	....	....	....	....	....	1	....	3	....	1	....	....
Adultery, cruelty and nonsupport	4	3	1	....	1	1	5	3	4	3	....	1	....	....	....	....	....	....	....	....	....	1	1	2	1	3	....	....
Adultery and desertion	5	2	1	....	5	3	4	3	5	2	....	....	....	1	....	....	....	....	....	....	....	....	1	4	....	3	....	....
Bigamy	5	3	....	....	4	....	1	1	6	1	1	....	....	....	....	....	....	....	....	....	....	1	3	4	....	....	....	....
Cruel and inhuman treatment	392	96	24	6	173	90	223	208	219	125	58	43	25	11	14	8	7	3	3	2	14	23	149	140	105	71	15	1
Cruelty and desertion	7	5	2	....	6	2	5	3	8	2	3	....	....	1	....	....	....	....	....	....	....	....	5	4	5	....	....	....
Cruelty, desertion and drunkenness	3	2	....	1	....	1	3	3	2	1	....	1	....	1	....	....	1	....	....	....	....	....	1	2	1	2	....	....
Cruelty, desertion and nonsupport	10	4	....	....	3	....	4	3	5	3	3	....	2	....	....	1	....	....	....	....	....	....	5	3	5	1	....	....
Desertion	330	27	38	21	191	28	87	73	204	100	58	21	9	10	6	1	3	1	....	3	1	3	128	129	100	46	9	....
Desertion and drunkenness	4	3	....	1	3	....	2	1	4	3	....	....	....	....	1	....	....	....	....	....	....	....	3	3	1	....	1	....
Desertion and nonsupport	92	29	10	3	51	5	56	45	62	26	24	11	5	1	3	1	....	1	....	....	2	....	35	49	31	12	5	....
Drunkenness	80	15	1	....	27	22	58	46	32	25	13	7	6	6	1	1	1	2	2	....	....	1	13	34	30	13	4	1
Drunkenness and nonsupport	50	13	3	....	26	4	40	32	22	15	13	7	3	3	1	....	....	....	2	....	1	....	12	19	25	9	....	....
Fraud in marriage	....	7	....	....	2	1	2	2	6	1	....	....	....	....	....	....	....	....	....	....	1	1	3	2	....	....	....	....
Insanity	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Imprisonment	6	1	1	....	4	....	1	....	4	1	2	....	....	....	....	1	....	....	....	....	....	....	2	3	1	1	1	....
Impotency	....	1	....	....	1	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....
Nonsupport	163	49	2	....	97	22	103	74	112	58	14	7	10	4	4	....	2	....	1	2	6	10	79	53	35	26	5	....
Refusal to cohabit	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Voluntary separation	18	6	3	....	23	1	3	2	12	5	6	2	1	1	....	....	....	....	....	....	....	....	....	7	10	7	3	....
Other causes or cause not stated	10	5	3	1	9	2	6	5	7	4	2	2	....	....	....	....	....	....	....	4	1	1	6	2	4	1	....	4
Total	1206	281	95	33	657	186	681	511	742	380	201	105	61	41	31	13	15	7	8	11	28	44	459	477	360	198	43	6

TABLE NO. 17. SHOWING DIVORCES IN WISCONSIN BY COUNTIES FROM OCT. 1, 1911, TO SEPT. 30, 1912, ARRANGED ACCORDING TO SEX, NATIVITY, PLACE OF MARRIAGE, NUMBER OF CHILDREN, AND DURATION OF MARRIAGE.

County.	Sex of complainant.	No. of divorces.	Nativity of plaintiff.			Nativity of defendant.		
			Native born.	Foreign born.	Unknown	Native born.	Foreign born.	Unknown
Adams	Total	.....	.....	.....	.....	.....	.....	.....
	Male	.....	.....	.....	.....	.....	.....	.....
	Female	.....	.....	.....	.....	.....	.....	.....
Ashland	Total	.....	.....	.....	.....	.....	.....	.....
	Male	.....	.....	.....	.....	.....	.....	.....
	Female	.....	.....	.....	.....	.....	.....	.....
Barron	Total	6	5	1	.....	5	1	.....
	Male	5	4	1	.....	1	.....	.....
	Female	1	1	.....	.....	4	1	.....
Bayfield	Total	5	.....	1	4	.....	1	4
	Male	1	.....	.....	1	.....	1	3
	Female	4	.....	1	3	.....	.....	1
Brown	Total	24	20	4	.....	17	6	1
	Male	6	6	.....	.....	11	6	1
	Female	18	14	4	.....	6	.....	.....
Buffalo	Total	1	1	.....	.....	1	.....	.....
	Male	1	1	.....	.....	.....	.....	.....
	Female	.....	.....	.....	.....	1	.....	.....
Burnett	Total	7	5	2	.....	4	3	.....
	Male	2	1	1	.....	3	2	.....
	Female	5	4	1	.....	1	1	.....
Calumet	Total	2	.....	.....	2	.....	.....	2
	Male	.....	.....	.....	.....	.....	.....	2
	Female	2	.....	.....	2	.....	.....	.....
Chippewa	Total	5	4	1	.....	3	1	1
	Male	2	1	1	.....	1	1	1
	Female	3	3	.....	.....	2	.....	.....
Clark	Total	14	10	4	.....	9	4	1
	Male	1	1	.....	.....	8	4	1
	Female	13	10	3	.....	1	.....	.....
Columbia	Total	12	.....	.....	12	.....	.....	12
	Male	3	.....	.....	3	.....	.....	9
	Female	9	.....	.....	9	.....	.....	3
Crawford	Total	7	.....	.....	7	.....	.....	7
	Male	1	.....	.....	1	.....	.....	6
	Female	6	.....	.....	6	.....	.....	1
Dane	Total	61	52	9	.....	48	13	.....
	Male	5	4	1	.....	44	12	.....
	Female	56	47	9	.....	4	1	.....
Dodge	Total	23	17	6	.....	16	7	.....
	Male	6	3	3	.....	13	4	.....
	Female	17	14	3	.....	3	3	.....
Door	Total	11	5	1	5	5	.....	6
	Male	3	1	.....	2	4	.....	4
	Female	8	4	1	3	1	.....	2
Douglas	Total	44	25	19	.....	31	12	1
	Male	9	4	5	.....	25	10	.....
	Female	35	22	13	.....	6	2	1

TABLE NO. 17—Continued. SHOWING DIVORCES IN WISCONSIN BY COUNTIES FROM OCT. 1, 1911, TO SEPT. 30, 1912, ARRANGED ACCORDING TO SEX, NATIVITY, PLACE OF MARRIAGE, NUMBER OF CHILDREN, AND DURATION OF MARRIAGE.

County.	Sex of complainant.	No. of divorces.	Nativity of plaintiff.			Nativity of defendant.		
			Native born.	Foreign born.	Unknown.	Native born.	Foreign born.	Unknown.
Dunn	Total	1	.....	.....	1	.....	.....	1
	Male	.....	.....	.....	.....	.....	.....	1
	Female	1	.....	.....	1	.....	.....	.....
Eau Claire	Total	22	16	5	1	13	6	3
	Male	3	3	.....	.....	11	4	4
	Female	19	13	4	2	3	.....	.....
Florence	Total	.....	.....	.....	.....	.....	.....	.....
	Male	.....	.....	.....	.....	.....	.....	.....
	Female	.....	.....	.....	.....	.....	.....	.....
Fond du Lac	Total	46	8	1	37	5	2	39
	Male	10	2	1	7	4	1	31
	Female	36	6	.....	30	2	1	7
Forest	Total	3	2	.....	1	2	.....	1
	Male	.....	.....	.....	.....	2	.....	1
	Female	3	2	.....	1	.....	.....	.....
Grant	Total	31	29	1	1	28	2	1
	Male	4	4	.....	.....	24	2	1
	Female	27	25	1	1	4	.....	.....
Green	Total	4	3	1	.....	4	.....	.....
	Male	.....	.....	.....	.....	4	.....	.....
	Female	4	3	1	.....	.....	.....	.....
Green Lake	Total	4	.....	.....	4	.....	.....	4
	Male	1	.....	.....	1	.....	.....	3
	Female	1	.....	.....	3	.....	.....	1
Iowa	Total	6	5	.....	1	6	.....	.....
	Male	.....	.....	.....	.....	6	.....	.....
	Female	6	5	.....	1	.....	.....	.....
Iron	Total	.....	.....	.....	.....	.....	.....	.....
	Male	.....	.....	.....	.....	.....	.....	.....
	Female	.....	.....	.....	.....	.....	.....	.....
Jackson	Total	4	1	3	.....	2	2	.....
	Male	3	1	2	.....	.....	1	.....
	Female	1	.....	1	.....	2	1	.....
Jefferson	Total	17	13	4	.....	12	4	1
	Male	3	2	1	.....	10	4	.....
	Female	14	11	3	.....	2	.....	1
Juneau	Total	10	9	1	.....	6	2	2
	Male	1	1	.....	.....	6	2	1
	Female	9	8	1	.....	.....	.....	1
Kenosha	Total	37	16	9	12	14	7	16
	Male	11	1	4	6	12	5	9
	Female	26	15	5	6	2	2	4
Kewaunee	Total	4	4	.....	.....	3	.....	1
	Male	1	1	.....	.....	2	.....	1
	Female	3	3	.....	.....	1	.....	.....
La Crosse	Total	38	35	3	.....	35	3	.....
	Male	6	6	.....	.....	29	3	.....
	Female	32	29	3	.....	6	.....	.....

TABLE NO. 17—Continued. SHOWING DIVORCES IN WISCONSIN BY COUNTIES FROM OCT. 1, 1911, TO SEPT. 30, 1912, ARRANGED ACCORDING TO SEX, NATIVITY, PLACE OF MARRIAGE, NUMBER OF CHILDREN, AND DURATION OF MARRIAGE.

County.	Sex of complainant.	No. of Divorces.	Nativity of plaintiff.			Nativity of defendant.		
			Native born.	Foreign born.	Unknown	Native born.	Foreign born.	Unknown
Lafayette	Total	5	5	.....	.....	4	1	.....
	Male	3	3	.....	.....	1	1	.....
	Female	2	2	.....	.....	3	.....	.....
Langlade	Total	12	9	1	2	9	.....	3
	Male	7	4	1	2	4	.....	1
	Female	5	5	.....	.....	5	.....	2
Lincoln	Total	6	2	1	3	2	2	2
	Male	.....	.....	.....	.....	2	2	2
	Female	6	2	1	3	.....	.....	.....
Manitowoc	Total	15	11	1	3	12	.....	3
	Male	1	1	.....	.....	11	.....	3
	Female	14	10	1	3	1	.....	.....
Marathon	Total	33	22	11	.....	23	10	.....
	Male	5	5	.....	.....	18	10	.....
	Female	28	17	11	.....	5	.....	.....
Marinette	Total	17	.....	.....	17	.....	.....	17
	Male	3	.....	.....	3	.....	.....	14
	Female	14	.....	.....	14	.....	.....	3
Marquette	Total	2	.....	2	.....	.....	2	.....
	Male	.....	.....	.....	.....	.....	2	.....
	Female	2	.....	2	.....	.....	.....	.....
Milwaukee	Total	541	361	159	21	347	155	39
	Male	109	58	49	2	282	116	34
	Female	432	303	110	19	65	39	5
Monroe	Total	8	8	.....	.....	8	.....	.....
	Male	1	1	.....	.....	7	.....	.....
	Female	7	7	.....	.....	1	.....	.....
Oconto	Total	8	.....	.....	8	.....	.....	8
	Male	2	.....	.....	2	.....	.....	6
	Female	6	.....	.....	6	.....	.....	2
Oneida	Total	8	7	1	.....	7	.....	1
	Male	1	1	.....	.....	6	.....	1
	Female	7	6	1	.....	1	.....	.....
Outagamie	Total	19	16	3	.....	15	4	.....
	Male	5	3	2	.....	12	2	.....
	Female	14	13	1	.....	3	2	.....
Ozaukee	Total	7	6	1	.....	5	2	.....
	Male	1	.....	1	.....	5	1	.....
	Female	6	6	.....	.....	.....	1	.....
Pepin	Total	2	.....	.....	2	1	.....	1
	Male	1	.....	.....	1	.....	.....	1
	Female	1	.....	.....	1	1	.....	.....
Pierce	Total	7	4	2	1	4	2	1
	Male	2	1	1	.....	3	1	1
	Female	5	3	1	1	1	1	.....
Polk	Total	8	5	2	1	4	4	.....
	Male	2	2	.....	.....	2	4	.....
	Female	6	3	2	1	2	.....	.....

TABLE NO. 17—Continued. SHOWING DIVORCES IN WISCONSIN BY COUNTIES FROM OCT. 1, 1911, TO SEPT. 30, 1912, ARRANGED ACCORDING TO SEX, NATIVITY, PLACE OF MARRIAGE, NUMBER OF CHILDREN, AND DURATION OF MARRIAGE.

County.	Sex of complainant.	No. of Divorces.	Nativity of plaintiff.			Nativity of defendant.		
			Native born.	Foreign born.	Unknown	Native born.	Foreign born.	Unknown
Portage	Total	16	13	.....	3	11	1	4
	Male	1	13	.....	2	11	1	3
	Female	15	.....	.....	1	.....	.....	1
Price	Total	3	.....	2	1	1	1	1
	Male	1	.....	1	.....	1	.....	1
	Female	2	.....	1	1	.....	1	.....
Racine	Total	67	42	25	.....	43	24	.....
	Male	19	13	6	.....	29	19	.....
	Female	48	29	19	.....	14	5	.....
Richland	Total	17	7	.....	10	4	.....	13
	Male	2	.....	.....	2	4	.....	11
	Female	15	7	.....	8	.....	.....	2
Rock	Total	50	42	8	7	.....	.....	7
	Male	9	8	1	.....	35	6	.....
	Female	41	34	7	.....	8	1	.....
Rusk	Total	7	.....	.....	7	.....	.....	7
	Male	3	.....	.....	3	.....	.....	4
	Female	4	.....	.....	4	.....	.....	3
St. Croix	Total	14	11	3	.....	10	4	.....
	Male	2	2	.....	.....	8	4	.....
	Female	12	9	3	.....	2	.....	.....
Sauk	Total	30	23	6	1	23	6	1
	Male	7	5	2	.....	19	4	.....
	Female	23	18	4	1	4	2	1
Sawyer	Total	4	.....	.....	4	.....	.....	4
	Male	2	.....	.....	2	.....	.....	2
	Female	2	.....	.....	2	.....	.....	2
Shawano	Total	12	10	2	.....	10	2	.....
	Male	3	3	.....	.....	8	1	.....
	Female	9	7	2	.....	2	1	.....
Sheboygan	Total	13	1	1	11	1	1	11
	Male	6	1	.....	5	.....	1	6
	Female	7	.....	1	6	1	.....	5
Taylor	Total	12	5	3	4	4	2	6
	Male	4	2	2	.....	2	1	5
	Female	8	3	1	4	2	1	1
Trempealeau	Total	1	1	.....	.....	1	.....	.....
	Male	.....	.....	.....	.....	1	.....	.....
	Female	1	1	.....	.....	.....	.....	.....
Vernon	Total	16	12	3	1	11	3	2
	Male	4	2	1	1	9	2	1
	Female	12	10	2	.....	2	1	1
Vilas	Total	.....	.....	.....	.....	.....	.....	.....
	Male	.....	.....	.....	.....	.....	.....	.....
	Female	.....	.....	.....	.....	.....	.....	.....
Walworth	Total	23	16	6	1	18	5	.....
	Male	7	7	.....	.....	11	5	.....
	Female	16	9	6	1	7	.....	.....

TABLE NO. 17—Continued. SHOWING DIVORCES IN WISCONSIN BY COUNTIES FROM OCT. 1, 1911, TO SEPT. 30, 1912, ARRANGED ACCORDING TO SEX, NATIVITY, PLACE OF MARRIAGE, NUMBER OF CHILDREN, AND DURATION OF MARRIAGE.

County.	Sex of complainant.	No. of divorces.	Nativity of plaintiff.			Nativity of defendant.		
			Native born.	Foreign born.	Unknown.	Native born.	Foreign born.	Unknown.
Washburn	Total	6	3	.....	3	3	.....	3
	Male	1	.....	.....	1	3	.....	2
	Female	5	3	.....	2	.....	.....	1
Washington	Total	1	1	.....	.....	1	.....	.....
	Male	.....	.....	.....	.....	1	.....	.....
	Female	1	1	.....	.....	.....	.....	.....
Waukesha	Total	27	20	7	.....	20	7	.....
	Male	9	7	2	.....	13	5	.....
	Female	18	13	5	.....	7	2	.....
Waupaca	Total	29	25	4	.....	23	5	1
	Male	7	5	2	.....	18	4	.....
	Female	22	20	2	.....	5	1	1
Waushara	Total	12	1	.....	11	1	1	10
	Male	3	.....	.....	3	1	1	7
	Female	9	1	.....	8	.....	.....	3
Winnebago	Total	89	.....	.....	89	.....	.....	89
	Male	19	.....	.....	19	.....	.....	70
	Female	70	.....	.....	70	.....	.....	19
Wood	Total	19	3	1	15	3	1	15
	Male	3	.....	1	2	3	.....	13
	Female	16	3	.....	13	.....	1	2
Total	.....	1,615	977	331	307	941	328	346

TABLE NO. 17—Concluded. SHOWING DIVORCES IN WISCONSIN BY COUNTIES FROM OCT. 1, 1911, TO SEPT 30, 1912, ARRANGED ACCORDING TO SEX, NATIVITY, PLACE OF MARRIAGE, NUMBER OF CHILDREN, AND DURATION OF MARRIAGE.

County.	Place of marriage				Gainful occupation of plaintiff.	Case contested.	Alimony.		Number of children in family.											Duration of marriage,							Cases pending.	Decree denied.
	Wisconsin.	United States.	Foreign countries.	Unknown.			Alimony asked.	Alimony granted.	No children.	1	2	3	4	5	6	7	8	9	10+	Not stated.	Under six months.	Under one year.	1-4 years.	5-9 years.	10-19 years.	20-29 years.	30+	Not stated.		
Adams																													
Ashland																													
Barron	5	1			5	2	4	1	2	1	2			1									1	4	1				
Bayfield	1		1	3	1		1	1	2		2	1											4	1					
Brown	21	3			11		11	11	8	5	5	2	2	1		1					2		3	13	5	1			
Buffalo	1				1				1														1						
Burnett	6	1			3		2	2	3	2	1				1								3	2	1			1	
Calumet	1			1						2													1			1			
Chippewa	4	1			3				1	2	2												1	1	2	1			
Clark	12	2			1	2	8	6	3	4	3			1	2		1						1	5	2	2	3	1		
Columbia	11			1	4		5	5	5	4	1	1	1										5	1	3	2	1		
Crawford	3			4	1		4	4	2	1	2			1									3	1	1	2			
Dane	45	15	1		17	4	13	10	29	11	12	1	4	2	1	1					1		16	17	14	11	2		
Dodge	21	1	1		7	9	15	15	9	6	1	2	1		3			1					8	5	6	4			1
Door	9	2			2		2	1	4	3	1	1	1	1									5	4	2				
Douglas	17	24	3		28	3	17	15	22	13	5	1	1				2				1		17	12	10	4			
Dunn				1			1		1															1					
Eau Claire	16	6			6		8	3	8	9	1	2	2										4	6	5	5	2		
Florence																													
Fond du Lac	33	8	1	4	12	15	26	12	22	11	8	1	1	1	1		1						2	15	13	8	7	1		1
Forest	3						1	1	1	1		1												1	1	1				
Grant	21	9	1		2		20	13	8	9	5	2	1	2	2			1	1					7	9	7	7	1		
Green	2	1		1			2	2	1			2		1									1			1	2			
Green Lake	4				1	2	4	4	1	2			1											1	1	2				
Iowa	5			1			2	1	2	1		2					1							1	3		2			
Iron																													
Jackson	4				3	2	1	1	1	1	1				1								1	1	1	1			
Jefferson	10	7			6	1	2	1	8	3	1	4				1							1	6	4	3	3			
Juneau	9	1			2		1	1	5	2	2			1									1	4	5					
Kenosha	26	6	5		20	2	8	7	21	4	5	5	1	1							1	1	14	8	13					

Kewaunee	3	1	....	....	2	4	....	....	2	1	1	....	....	....	....	....	....	....	....	....	....	....	3	1	....	....	....	....	....	....
La Crosse	28	8	2	....	16	5	16	12	18	4	9	....	1	2	2	1	....	....	1	....	....	3	8	12	9	4	2	....	....	....
Lafayette	5	....	....	....	3	1	2	2	2	3	....	....	....	....	....	....	....	....	....	....	....	1	2	1	....	1	....	....	....	....
Langlade	9	3	....	....	8	....	4	3	6	3	....	....	2	1	....	....	....	....	....	....	....	....	4	1	3	4	....	....	....	....
Lincoln	4	1	....	1	....	1	3	3	1	1	2	....	....	....	....	....	1	....	1	....	....	....	3	1	....	2	....	....	....	....
Manitowoc	11	4	....	....	2	2	9	5	4	6	2	2	1	....	....	....	....	....	....	....	....	....	6	5	3	1	....	....	....	....
Marathon	30	3	....	....	15	5	10	8	11	7	6	5	1	....	1	1	....	....	1	....	2	1	7	8	9	6	....	....	....	....
Marinette	7	6	1	3	6	....	5	4	8	4	1	1	2	1	....	....	....	....	....	....	1	2	5	3	5	1	....	....	....	....
Marquette	1	....	1	....	....	1	2	2	2	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1	....	....	....	....
Milwaukee	437	43	59	2	308	61	256	198	278	129	65	28	17	9	7	3	2	....	1	2	12	11	149	182	124	53	8	2	2	1
Monroe	8	....	....	....	3	1	4	4	2	3	1	2	....	....	....	....	....	....	....	....	....	....	3	2	2	1	....	....	....	....
Oconto	5	1	1	1	3	4	6	6	2	2	3	....	....	1	....	....	....	....	....	....	....	2	....	2	1	1	2	....	....	1
Oneida	6	2	....	....	3	2	3	3	1	4	2	1	....	....	....	....	....	....	....	....	....	....	1	4	2	....	1	....	....	....
Outagamie	15	4	....	....	7	5	10	9	10	2	2	1	1	1	1	....	....	....	1	....	1	....	1	9	4	2	2	....	....	....
Ozaukee	6	1	....	....	1	1	2	....	4	2	....	....	1	....	....	....	....	....	....	....	1	....	1	2	2	....	1	....	....	....
Pepin	2	....	....	....	1	1	1	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....
Pierce	5	2	....	....	2	....	....	....	2	1	1	....	1	....	....	1	....	1	....	....	....	....	1	1	3	1	1	....	....	....
Polk	7	1	....	....	2	2	4	3	6	2	....	....	....	....	....	....	....	....	....	....	....	....	3	4	1	....	....	....	....	....
Portage	11	4	....	1	2	....	10	10	7	2	....	4	1	....	....	2	....	....	....	....	2	....	3	5	4	....	2	....	....	....
Price	2	1	....	....	1	....	1	1	1	1	1	....	....	....	....	....	....	....	....	....	....	....	2	1	....	....	....	....	....	....
Racine	40	22	5	....	32	8	21	11	32	19	9	2	1	3	....	....	1	....	....	....	....	2	23	16	13	12	1	....	....	5
Richland	12	2	....	3	1	4	7	7	5	7	2	1	1	....	....	....	1	....	....	....	....	....	6	4	2	4	1	....	....	....
Rock	22	25	2	1	11	3	19	16	27	12	2	6	1	1	1	....	....	....	....	....	1	2	16	13	13	4	1	....	....	2
Rusk	2	4	1	....	1	....	....	....	3	2	1	....	....	....	1	....	....	....	....	....	....	....	1	3	2	1	....	....	....	....
St. Croix	10	3	1	....	3	2	4	4	7	2	2	1	1	....	1	....	....	....	....	....	....	....	3	5	2	3	1	....	....	1
Sauk	22	7	1	....	15	4	12	10	13	6	4	1	2	1	....	....	1	1	1	....	....	1	8	7	5	7	2	....	....	....
Sawyer	2	....	....	2	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	2	....	....	....	2	....	....	....	2	....	1
Shawano	11	1	....	....	6	2	5	3	4	4	....	2	....	1	1	....	....	....	....	....	....	2	1	3	4	1	1	....	....	....
Sheboygan	9	1	2	1	....	....	5	....	5	....	....	2	2	....	....	....	....	....	....	4	....	2	3	2	5	....	....	1	....	....
Taylor	8	3	....	1	5	3	6	6	2	3	1	2	3	1	....	....	....	....	....	....	....	....	4	2	4	2	....	....	....	....
Trempealeau	1	....	....	....	1	....	1	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....
Vernon	14	1	1	....	15	2	5	5	7	4	1	1	1	1	....	....	....	1	....	....	....	....	8	4	2	1	1	....	....	....
Vilas	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Walworth	16	6	1	....	15	3	2	2	10	7	1	4	....	....	....	....	....	....	....	1	....	....	5	8	6	3	1	....	....	....
Washburn	4	2	....	....	1	....	3	1	2	2	....	....	....	....	....	1	....	....	....	1	....	....	1	3	2	....	....	....	....	....
Washington	1	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....
Waukesha	22	4	1	....	12	4	9	7	14	4	5	2	....	2	....	....	....	....	....	....	....	2	6	12	2	4	1	....	....	....
Waupaca	26	3	....	....	7	....	9	8	18	5	....	3	1	....	1	....	1	....	....	....	1	1	10	4	10	2	1	....	....	....
Waushara	10	2	....	....	2	2	7	6	4	1	2	....	....	2	1	....	2	....	....	....	....	....	4	1	2	4	1	....	....	....
Winnebago	66	20	3	....	8	10	46	21	46	20	11	4	4	1	1	1	1	....	....	....	2	4	27	20	23	10	3	....	....	....
Wood	16	2	....	1	1	1	14	13	4	6	3	1	....	....	2	....	....	1	1	1	....	1	4	5	2	6	1	....	....	....
Total	1,206	281	95	33	657	186	681	511	742	380	201	105	61	41	31	13	15	7	8	11	28	44	459	477	360	198	43	6	2	13

TABLE NO. 18.—SHOWING DIVORCE FROM CERTAIN CAUSES ARRANGED BY COUNTIES AND SEX OF PLAINTIFF FROM OCT. 1, 1912, TO SEPT. 30, 1913.

County.	All causes.		Adultery.		Cruelty.		Desertion.		Drunkenness.		Nonsupport.		Cases pending.	De-cree de-nied.
	Granted to husband.	Granted to wife.	Granted to husband.	Granted to wife.	Granted to husband.	Granted to wife.	Granted to husband.	Granted to wife.	Granted to husband.	Granted to wife.	Granted to husband.	Granted to wife.		
Adams		1				1								
Ashland	2	14				4	1	2		1		6		
Barron	2	5				2	2	2						
Bayfield	3	6			2	1	1	1		2				
Brown	3	22	1			10	2	4		3		4		
Buffalo		2				1								
Burnett	1	1					1					1		
Calumet	1	2			1	2								
Chippewa	1	5				3	1	2						
Clark	7	20			2	2	5	7		7		3		
Columbia														
Crawford	3	14		2		5	3	4		3				
Dane	18	36	1	1	6	12	11	9		3		8		1
Dodge	6	6	2			1	3	4		1				
Door	1	2				1	1	1						
Douglas	5	46	2			7	3	11		12		13		
Dunn	5	9			1	5	3	2	1			1		
Eau Claire	3	15			1	7	2	5		1		2		
Florence		2										2		
Fond du Lac	6	13			1	8	3	4						
Forest														
Grant	3	13				4	3	8		1				
Green		13				5		4		2		1		
Green Lake	3	4	1			3	2	1						
Iowa	1	8		1		4	1	2				1		
Iron		7		1		2		3						
Jackson		6				1		1		1		3		
Jefferson	3	23	1	1		7	2	10		4				
Juneau	4	3			2	2	1			1				
Kenosha	10	28	2		3	10	4	4	1	1		11		
Kewaunee		1				1								
La Crosse	2	21		1		6	2	7		6		1		

La Fayette	1	8				5	1	3						
Langlade	5	11			2	4	2	4		3			5	1
Lincoln	3	11		1	1	6	2	1		1		1		
Manitowoc	6	8	1			8	3		1					
Marathon														
Marinette	8	8	1	1	2	2	4	2		2		1		
Marquette		1						1						
Milwaukee	47	214	4	1	12	105	26	52	3	6		40		
Monroe	3	8				1	2	2		4		1		
Oconto	2	11			2	6		2				3		
Oneida	4	5			3		1	3		2				
Outagamie	10	44	2		2	19	5	11		5		5		
Ozaukee	3	5			2	3	1	1		1				
Pepin		1										1		
Pierce	4	4				1	3	1		1		1		
Polk		1						1						
Portage	7	17			2	8	5	6		1		1		
Price		9				3		4				2		
Racine	25	115	1	3	9	39	15	27		7		33		
Richland	4	17	1		1	5	1	5		1		6		
Rock	17	54	2		2	18	12	17		9		9		
Rusk		6		1		2				1		1		
St. Croix	1	8			1	3		2		2		1		
Sauk	3	26		1		12	3	6		4		3		
Sawyer		2						1				1		
Shawano	6	5			3	4	3					1		
Sheboygan														
Taylor	5		2		1		2							
Trempealeu		8				3		1		1				
Vernon														
Vilas														
Walworth	2	12				6	2	1		4		1		
Washburn	3	10	1			2	2	3		2		2	2	1
Washington	1	2	1					2						
Waukesha	6	27			2	12	4	7		1		4		
Waupaca	3	19	1	2	1	9	1	5		2		1		
Waushara	1	2		1			1	1						
Winnebago	13	56	2	2	4	39	6	9		1		4		
Wood	6	16	1		1	6	3	8		1		1		
Total	232	1,099	30	20	72	448	167	287	6	111		181	7	3

TABLE NO. 19.—SHOWING DIVORCES FROM EACH CAUSE TABULATED BY COUNTIES FROM OCT. 1, 1912 TO Sept. 30, 1913.

County.	Adultery.				Bigamy.	Cruelty.				Desertion.			Drunkenness.		Fraud in marriage.	Insanity.	Imprisonment.	Impotency.	Nonsupport.	Refusal to cohabit.	Voluntary separation.	Other causes or cause not stated.	Cases pending.	Decree denied.
	Adultery.	Adultery and cruelty.	Adultery, cruelty and nonsupport.	Adultery and desertion.		Cruel and inhuman treatment.	Cruelty and desertion.	Cruelty, desertion and drunkenness.	Cruelty, desertion and no support.	Desertion.	Desertion and drunkenness.	Desertion and nonsupport.	Drunkenness.	Drunkenness and non support.										
Adams						1																		
Ashland					1	3			1	2		1	1						6		1			
Barron						2				3		1									1			
Bayfield						3				2				2			1				1			
Brown	1					8			2	6			2	1					4		1			
Buffalo						1															1			
Burnett										1									1					
Calumet						3																		
Chippewa						3				1	1	1												
Clark						3	1			11		1	6	1				1	3					
Columbia																								
Crawford	2					4	1			4		3	3											
Dane	2				2	15	2		1	17		3	1	2					8		1			1
Dodge	2					1				4	1	2	1			1								
Door						1				1		1												
Douglas	2					7				9		5	7	5				1	13		2			
Dunn						6				5			1				1		1					
Eau Claire						7			1	5		2	1						2					
Florence																			2					
Fond du Lac						6	3			7							1				2			
Forest																								
Grant						4				4		7		1										
Green						5				2		2	2						1		1			
Green Lake	1					3				2	1													
Iowa		1				4				1	1	1							1					
Iron				1		2				3											1			
Jackson						1				1				1					3					
Jefferson	2					7				12			4								1			
Juneau						4				1			1								1			
Kenosha	1			1		11	2			5		3	2						11		1	1		

Kewaunee						1																			
La Crosse			1			6				3		6	3	3					1						
La Fayette						4	1			4															
Langlade						6				6			2	1							1		5	1	
Lincoln			1			6	1			3			1				1		1						
Manitowoc		1			1	5	3			3			1												
Marathon																									
Marinette	1	1				4				6			1	1	1				1						
Marquette										1															
Milwaukee	3			2	1	76	2	5	34	53	1	24	4	5	2		1	1	40		5	2			
Monroe								1		3		1	2	2					1		1				
Oconto						8				1		1							3						
Oneida						3				2		2	1	1											
Outagamie	2					21				10	1	5	4	1	2		1		5		2				
Ozaukee						4	1			2				1											
Pepin																			1						
Pierce						1				3		1	1						1			1			
Polk										1															
Portage						10				8		3	1						1		1				
Price						3				3		1							2						
Racine	3	1			3	47			1	29		13	2	5	2				33		1				
Richland	1					5	1			6				1		1			6						
Rock	2					17	1		2	26		3	9						9		2				
Rusk	1							2						1			1		1						
St. Croix						4						2	2						1						
Sauk			1			11		1		8		1	4						3						
Sawyer										1									1						
Shawano						7				3									1						
Sheboygan																									
Taylor	1			1		1				2															
Trempealeau						3				1				1			1				2				
Vernon																									
Vilas																									
Walworth						6				2		1	4						1						
Washburn	1					1	1			5			2		1				2				2	1	
Washington	1									1	1														
Waukesha					1	14				5		6	1					1	4			1			
Waupaca	2	1				10				3		3	2						1						
Waushara		1								2															
Winnebago	4					43				15			1						4		2				
Wood	1					7				10		1		1					1		1				
Total	36	6	3	5	9	449	20	9	42	340	7	107	80	37	8	2	8	4	181		33	5	7	3	

TABLE NO. 20.—SHOWING DIVORCES IN WISCONSIN FROM OCT. 1, 1912, TO SEPT. 30, 1913, ARRANGED ACCORDING TO CAUSE, SEX, NATIVITY, PLACE OF MARRIAGE, NUMBER OF CHILDREN AND DURATION OF MARRIAGE.

Causes.	Sex of complainant.	No. of divorces.	Nativity of plaintiff.			Nativity of defendant.		
			Native born.	Foreign born.	Unknown	Native born.	Foreign born.	Unknown
Adultery	Total	36	19	6	11	18	5	13
	Male	23	13	5	5	6	1	6
	Female	13	6	1	6	12	4	7
Adultery and cruelty	Total	6	3	1	2	3	1	2
	Male	3	1	1	1	1	1	1
	Female	3	2	.....	1	2	.....	1
Adultery, cruelty and nonsupport	Total	3	2	1	.....	3	.....	.....
	Male	.....	.....	.....	.....	3	.....	.....
	Female	3	2	1	.....	.....	.....	.....
Adultery and desertion	Total	5	.....	3	2	.....	3	2
	Male	4	.....	3	1	.....	.....	1
	Female	1	.....	.....	1	.....	3	1
Bigamy	Total	9	7	.....	2	6	1	2
	Male	1	.....	.....	1	6	1	1
	Female	8	7	.....	1	.....	.....	1
Cruel and inhuman treatment	Total	449	294	79	76	265	95	89
	Male	72	36	17	19	232	79	66
	Female	377	258	62	57	33	16	23
Cruelty and desertion	Total	20	12	3	5	8	6	6
	Male	.....	.....	.....	.....	8	6	6
	Female	20	12	3	5	.....	.....	.....
Cruelty, desertion and drunkenness	Total	9	5	2	2	5	2	2
	Male	.....	.....	.....	.....	5	2	2
	Female	9	5	2	2	.....	.....	.....
Cruelty, desertion and nonsupport	Total	42	27	11	4	23	14	5
	Male	.....	.....	.....	.....	23	14	5
	Female	42	27	11	4	.....	.....	.....
Desertion	Total	340	200	62	78	185	60	95
	Male	167	96	36	35	84	33	56
	Female	173	104	26	43	101	27	39
Desertion and drunkenness	Total	7	6	1	.....	7	.....	.....
	Male	.....	.....	.....	.....	7	.....	.....
	Female	7	6	1	.....	.....	.....	.....
Desertion and nonsupport	Total	107	78	17	12	73	19	15
	Male	.....	.....	.....	.....	73	19	15
	Female	107	78	17	12	.....	.....	.....
Drunkenness	Total	80	49	20	11	46	23	11
	Male	5	2	3	.....	44	21	10
	Female	75	47	17	11	2	2	1
Drunkenness and nonsupport	Total	37	22	9	6	18	13	6
	Male	1	1	.....	.....	17	13	6
	Female	36	21	9	6	1	.....	.....
Fraud in marriage	Total	8	6	.....	2	6	.....	2
	Male	2	1	.....	1	5	.....	1
	Female	6	5	.....	1	1	.....	1
Insanity	Total	2	1	.....	1	1	.....	1
	Male	1	.....	.....	1	1	.....	.....
	Female	1	1	.....	.....	.....	.....	1
Imprisonment	Total	8	4	1	3	3	2	3
	Male	.....	.....	.....	.....	3	2	3
	Female	8	4	1	3	.....	.....	.....
Impotency	Total	4	3	1	.....	3	1	.....
	Male	.....	.....	.....	.....	3	1	.....
	Female	4	3	1	.....	.....	.....	.....
Nonsupport	Total	181	112	38	31	112	37	32
	Male	.....	.....	.....	.....	112	37	32
	Female	181	112	38	31	.....	.....	.....
Refusal to cohabit	Total	.....	.....	.....	.....	.....	.....	.....
	Male	.....	.....	.....	.....	.....	.....	.....
	Female	.....	.....	.....	.....	.....	.....	.....
Voluntary separation	Total	33	17	10	6	13	11	9
	Male	11	3	4	4	11	6	5
	Female	22	14	6	2	2	5	4
Other causes or cause not stated	Total	5	4	1	.....	4	1	.....
	Male	2	1	1	.....	3	.....	.....
	Female	3	3	.....	.....	1	1	.....
	Total	1,391	871	266	254	802	294	295

TABLE NO. 20—Concluded. SHOWING DIVORCES IN WISCONSIN FROM OCT. 1, 1912, TO SEPT. 30, 1913, ARRANGED ACCORDING TO CAUSE, SEX, NATIVITY, PLACE OF MARRIAGE, NUMBER OF CHILDREN AND DURATION OF MARRIAGE.

Causes.	Place of marriage.				Gainful occupation of plaintiff.	Case contested.	Alimony.		Number of children in family.												Duration of marriage.							
	Wisconsin.	United States.	Foreign countries.	Unknown.			Alimony asked.	Alimony granted.	No. children.	1	2	3	4	5	6	7	8	9	10+	Not stated.	Under six months.	Under one year.	1–4 years.	5–9 years.	10–19 years.	20–29 years.	30+	Not stated.
Adultery	27	5	4	....	9	5	6	4	17	6	9	1	2	....	....	....	....	....	....	1	2	1	6	12	9	2	....	4
Adultery and cruelty	5	1	....	....	3	1	3	3	2	1	....	1	....	1	1	....	....	....	....	....	1	....	1	....	2	2	....	....
Adultery, cruelty and nonsupport	....	3	....	....	1	2	3	1	2	....	....	1	....	....	....	....	....	....	....	....	1	....	1	....	....	1	....	....
Adultery and desertion	3	....	2	....	....	....	....	....	1	2	....	1	1	....	....	....	....	....	....	....	....	....	2	1	2	....	....	....
Bigamy	5	4	....	....	4	1	4	1	7	1	1	....	....	....	....	....	....	....	....	....	4	1	1	2	....	....	....	1
Cruel and inhuman treatment	318	99	26	6	68	66	258	226	178	107	65	36	20	16	8	4	5	1	3	6	30	17	105	97	96	59	8	37
Cruelty and desertion	16	4	....	....	6	4	8	4	9	5	2	2	2	....	....	....	....	....	....	....	2	2	7	4	4	....	1	....
Cruelty, desertion and drunkenness	5	3	1	....	3	....	3	2	2	2	4	....	....	....	....	....	1	....	....	....	....	1	2	4	1	1	....	....
Cruelty, desertion and nonsupport	31	7	3	1	20	5	24	12	21	9	3	3	3	....	....	1	....	1	1	9	2	11	9	8	2	1	....
Desertion	202	105	23	10	60	19	68	53	169	81	42	14	12	7	3	4	2	....	....	6	58	24	108	61	60	14	8	7
Desertion and drunkenness	6	1	....	....	3	....	4	4	3	2	....	2	....	....	....	....	....	....	....	....	....	2	2	2	....	1	....	....
Desertion and nonsupport	69	34	3	1	43	3	36	34	43	39	10	6	5	....	3	....	....	1	....	....	17	9	40	20	15	5	1	....
Drunkenness	63	12	4	1	19	12	33	33	27	14	13	9	5	6	3	....	1	1	1	....	3	1	13	18	16	19	5	5
Drunkenness and nonsupport	24	11	2	....	15	2	20	14	9	12	7	4	3	....	1	....	1	....	....	....	2	1	9	6	13	5	....	1
Fraud in marriage	2	6	....	....	2	....	....	....	8	....	....	....	....	....	....	....	....	....	....	....	5	....	2	1	....	....	....	....
Insanity	1	....	....	1	....	1	....	....	1	....	....	....	1	....	....	....	....	....	....	....	....	....	1	....	....	....	....	1
Imprisonment	7	....	....	1	1	....	2	....	3	2	1	1	....	1	....	....	....	....	....	....	....	1	3	3	1	....	....	....
Impotency	2	1	1	....	2	....	1	1	4	....	....	....	....	....	....	....	....	....	....	....	2	....	....	2	....	....	....	....
Nonsupport	120	47	10	4	71	12	82	68	74	46	23	12	8	8	5	2	....	....	....	3	24	13	44	38	39	11	2	10
Refusal to cohabit	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Voluntary separation	22	5	4	2	8	2	2	8	11	6	8	4	2	1	....	....	1	....	....	....	3	2	7	7	9	5	....	....
Other causes or cause not stated	2	2	1	....	....	1	2	2	4	....	1	....	....	....	....	....	....	....	....	....	1	2	1	....	....	....	....	1
Total	930	350	84	27	338	136	559	470	595	335	189	97	64	40	24	11	11	3	5	17	164	79	366	287	275	127	26	67

TABLE NO. 21.—SHOWING DIVORCES IN WISCONSIN BY COUNTIES FROM OCT. 1, 1912, TO SEPT. 30, 1913, ARRANGED ACCORDING TO SEX, NATIVITY, PLACE OF MARRIAGE, NUMBER OF CHILDREN, AND DURATION OF MARRIAGE.

County.	Sex of complainant.	No. of divorces.	Nativity of plaintiff.			Nativity of defendant.		
			Native born.	Foreign born.	Unknown.	Native born.	Foreign born.	Unknown.
Adams	Total	1	1	.....	.....	1	.....	.....
	Male	.....	.....	.....	.....	1	.....	.....
	Female	1	1	.....	.....	.....	.....	.....
Ashland	Total	16	3	.....	13	2	1	13
	Male	2	.....	.....	2	2	1	11
	Female	14	3	.....	11	.....	.....	2
Barron	Total	7	5	2	.....	4	3	.....
	Male	2	2	.....	.....	2	3	.....
	Female	5	3	2	.....	2	.....	.....
Bayfield	Total	9	5	3	1	6	2	1
	Male	3	1	1	1	4	2	.....
	Female	6	4	2	.....	2	.....	1
Brown	Total	25	24	1	.....	21	4	.....
	Male	3	3	.....	.....	18	4	.....
	Female	22	21	1	.....	3	.....	.....
Buffalo	Total	2	2	.....	.....	1	.....	1
	Male	.....	.....	.....	.....	1	.....	1
	Female	2	2	.....	.....	.....	.....	.....
Burnett	Total	2	2	.....	.....	2	.....	.....
	Male	1	1	.....	.....	1	.....	.....
	Female	1	1	.....	.....	1	.....	.....
Calumet	Total	3	1	.....	2	2	.....	1
	Male	1	.....	.....	1	2	.....	.....
	Female	2	1	.....	1	.....	.....	1
Chippewa	Total	6	5	.....	1	4	1	1
	Male	1	1	.....	.....	3	1	1
	Female	5	4	.....	1	1	.....	.....
Clark	Total	27	21	6	.....	17	9	1
	Male	7	6	1	.....	13	6	1
	Female	20	15	5	.....	4	3	.....
Columbia	Total	.....	.....	.....	.....	.....	.....	.....
	Male	.....	.....	.....	.....	.....	.....	.....
	Female	.....	.....	.....	.....	.....	.....	.....
Crawford	Total	17	.....	.....	17	.....	.....	17
	Male	3	.....	.....	3	.....	.....	14
	Female	14	.....	.....	14	.....	.....	3
Dane	Total	54	46	8	.....	39	9	6
	Male	18	16	2	.....	25	7	4
	Female	36	30	6	.....	14	2	2
Dodge	Total	12	9	3	.....	9	3	.....
	Male	6	5	1	.....	4	2	.....
	Female	6	4	2	.....	5	1	.....
Door	Total	3	1	.....	2	2	.....	1
	Male	1	1	.....	.....	1	.....	1
	Female	2	.....	.....	2	1	.....	.....
Douglas	Total	51	33	18	.....	29	22	.....
	Male	5	4	1	.....	25	21	.....
	Female	46	29	17	.....	4	1	.....

TABLE NO. 21—Continued. SHOWING DIVORCES IN WISCONSIN BY COUNTIES FROM OCT. 1, 1912, TO SEPT. 30, 1913, ARRANGED ACCORDING TO SEX, NATIVITY, PLACE OF MARRIAGE, NUMBER OF CHILDREN, AND DURATION OF MARRIAGE.

County.	Sex of complainant.	Number of divorces.	Nativity of plaintiff.			Nativity of defendant.		
			Native born.	Foreign born.	Unknown.	Native born.	Foreign born.	Unknown.
Dunn	Total	14	10	2	2	10	1	3
	Male	5	3	2	.....	6	1	2
	Female	9	7	.....	2	4	.....	1
Eau Claire	Total	18	11	2	5	11	1	6
	Male	3	2	1	.....	8	1	6
	Female	15	9	1	5	3	.....	.....
Florence	Total	2	.....	1	1	.....	.....	2
	Male	.....	.....	.....	.....	.....	.....	2
	Female	2	.....	1	1	.....	.....	.....
Fond du Lac	Total	19	4	1	14	4	1	14
	Male	6	.....	1	5	4	.....	9
	Female	13	4	.....	9	.....	1	5
Forest	Total	.....	.....	.....	.....	.....	.....	.....
	Male	.....	.....	.....	.....	.....	.....	.....
	Female	.....	.....	.....	.....	.....	.....	.....
Grant	Total	16	16	.....	.....	16	.....	.....
	Male	3	3	.....	.....	13	.....	.....
	Female	13	13	.....	.....	3	.....	.....
Green	Total	13	10	2	1	10	3	.....
	Male	.....	.....	.....	.....	10	3	.....
	Female	13	10	2	1	.....	.....	.....
Green Lake	Total	7	5	2	.....	5	2	.....
	Male	3	1	2	.....	4	.....	.....
	Female	4	4	.....	.....	1	2	.....
Iowa	Total	9	9	.....	.....	9	.....	.....
	Male	1	1	.....	.....	8	.....	.....
	Female	8	8	.....	.....	1	.....	.....
Iron	Total	7	7	.....	.....	7	.....	.....
	Male	.....	.....	.....	.....	7	.....	.....
	Female	7	7	.....	.....	.....	.....	.....
Jackson	Total	6	5	1	.....	2	4	.....
	Male	.....	.....	.....	.....	2	4	.....
	Female	6	5	1	.....	.....	.....	.....
Jefferson	Total	26	23	3	.....	21	5	.....
	Male	3	2	1	.....	18	5	.....
	Female	23	21	2	.....	3	.....	.....
Juneau	Total	7	6	1	.....	5	1	1
	Male	4	3	1	.....	2	.....	1
	Female	3	3	.....	.....	3	1	.....
Kenosha	Total	38	26	11	1	23	13	2
	Male	10	4	6	.....	20	8	.....
	Female	28	22	5	1	3	5	2
Kewaunee	Total	1	1	.....	.....	.....	.....	1
	Male	.....	.....	.....	.....	.....	.....	1
	Female	1	1	.....	.....	.....	.....	.....
La Crosse	Total	23	17	.....	6	17	.....	6
	Male	2	.....	.....	2	16	.....	5
	Female	21	17	.....	4	1	.....	1

TABLE NO. 21—Continued. SHOWING DIVORCES IN WISCONSIN BY COUNTIES FROM OCT. 1, 1912, TO SEPT. 30, 1913, ARRANGED ACCORDING TO SEX, NATIVITY, PLACE OF MARRIAGE, NUMBER OF CHILDREN, AND DURATION OF MARRIAGE.

County.	Sex of complainant.	Number of divorces.	Nativity of plaintiff.			Nativity of defendant.		
			Native born.	Foreign born.	Unknown.	Native born.	Foreign born.	Unknown.
La Fayette	Total	9	8	.....	1	7	1	1
	Male	1	.....	.....	1	7	1	.....
	Female	8	8	.....	.....	.....	.....	1
Langlade	Total	16	13	3	.....	12	3	1
	Male	5	4	1	.....	9	2	.....
	Female	11	9	2	.....	3	1	1
Lincoln	Total	14	7	5	2	4	4	6
	Male	3	1	1	1	3	3	5
	Female	11	6	4	1	1	1	1
Manitowoc	Total	14	10	1	3	10	1	3
	Male	6	5	.....	1	5	1	2
	Female	8	5	1	2	5	.....	1
Marathon	Total	.....	.....	.....	.....	.....	.....	.....
	Male	.....	.....	.....	.....	.....	.....	.....
	Female	.....	.....	.....	.....	.....	.....	.....
Marinette	Total	16	.....	.....	16	.....	.....	16
	Male	8	.....	.....	8	.....	.....	8
	Female	8	.....	.....	8	.....	.....	8
Marquette	Total	1	1	.....	.....	1	.....	.....
	Male	.....	.....	.....	.....	1	.....	.....
	Female	1	1	.....	.....	.....	.....	.....
Milwaukee	Total	261	154	88	19	148	91	22
	Male	47	19	25	3	122	74	18
	Female	214	135	63	16	26	17	4
Monroe	Total	11	8	2	1	8	2	1
	Male	3	1	1	1	7	.....	1
	Female	8	7	1	.....	1	1	1
Oconto	Total	13	13	.....	.....	13	.....	.....
	Male	2	2	.....	.....	11	.....	.....
	Female	11	11	.....	.....	2	.....	.....
Oneida	Total	9	7	2	.....	6	3	.....
	Male	4	3	1	.....	4	1	.....
	Female	5	4	1	.....	2	2	.....
Outagamie	Total	54	47	7	.....	41	13	.....
	Male	10	9	1	.....	32	12	.....
	Female	44	38	6	.....	9	1	.....
Ozaukee	Total	8	8	.....	.....	3	1	4
	Male	3	3	.....	.....	3	1	1
	Female	5	5	.....	.....	.....	.....	3
Pepin	Total	1	.....	.....	1	.....	.....	1
	Male	.....	.....	.....	.....	.....	.....	1
	Female	1	.....	.....	1	.....	.....	.....
Pierce	Total	8	7	1	.....	8	.....	.....
	Male	4	4	.....	.....	4	.....	.....
	Female	4	3	1	.....	4	.....	.....
Polk	Total	1	1	.....	.....	.....	.....	1
	Male	.....	.....	.....	.....	.....	.....	1
	Female	1	1	.....	.....	.....	.....	.....

TABLE NO. 21—Continued. SHOWING DIVORCES IN WISCONSIN BY COUNTIES FROM OCT. 1, 1912, TO SEPT. 30, 1913, ARRANGED ACCORDING TO SEX, NATIVITY, PLACE OF MARRIAGE, NUMBER OF CHILDREN, AND DURATION OF MARRIAGE.

County.	Sex of complainant.	Number of divorces.	Nativity of plaintiff.			Nativity of defendant.		
			Native born.	Foreign born.	Unknown	Native born.	Foreign born.	Unknown
Portage	Total	24	17	3	4	15	1	8
	Male	7	4	.....	3	12	1	4
	Female	17	13	3	1	3	.....	4
Price	Total	9	7	2	.....	6	2	1
	Male	.....	.....	.....	.....	6	2	1
	Female	9	7	2	.....	.....	.....	.....
Racine	Total	140	86	49	5	83	49	8
	Male	25	14	8	3	69	41	5
	Female	115	72	41	2	14	8	3
Richland	Total	21	1	.....	20	.....	.....	21
	Male	4	.....	.....	4	.....	.....	17
	Female	17	1	.....	16	.....	.....	4
Rock	Total	71	61	10	.....	60	11	.....
	Male	17	13	4	.....	47	7	.....
	Female	54	48	6	.....	13	4	.....
Rusk	Total	6	1	.....	5	.....	.....	6
	Male	.....	.....	.....	.....	.....	.....	6
	Female	6	1	.....	5	.....	.....	.....
St. Croix	Total	9	5	3	1	5	3	1
	Male	1	1	.....	.....	4	3	1
	Female	8	4	3	1	1	.....	.....
Sauk	Total	29	23	5	1	21	5	3
	Male	3	2	1	.....	19	4	3
	Female	26	21	4	1	2	1	.....
Sawyer	Total	2	.....	.....	2	.....	.....	2
	Male	.....	.....	.....	.....	.....	.....	2
	Female	2	.....	.....	2	.....	.....	.....
Shawano	Total	11	10	1	.....	9	2	.....
	Male	6	5	1	.....	4	1	.....
	Female	5	5	.....	.....	5	1	.....
Sheboygan	Total	.....	.....	.....	.....	.....	.....	.....
	Male	.....	.....	.....	.....	.....	.....	.....
	Female	.....	.....	.....	.....	.....	.....	.....
Taylor	Total	5	.....	1	4	.....	1	4
	Male	5	.....	1	4	.....	.....	.....
	Female	.....	.....	.....	.....	.....	1	4
Trempealeau	Total	8	6	.....	2	4	.....	4
	Male	.....	.....	.....	.....	4	.....	4
	Female	8	6	.....	2	.....	.....	.....
Vernon	Total	.....	.....	.....	.....	.....	.....	.....
	Male	.....	.....	.....	.....	.....	.....	.....
	Female	.....	.....	.....	.....	.....	.....	.....
Vilas	Total	.....	.....	.....	.....	.....	.....	.....
	Male	.....	.....	.....	.....	.....	.....	.....
	Female	.....	.....	.....	.....	.....	.....	.....
Walworth	Total	14	12	2	.....	13	1	.....
	Male	2	2	.....	.....	11	1	.....
	Female	12	10	2	.....	2	.....	.....

TABLE NO. 21—Continued. SHOWING DIVORCES IN WISCONSIN BY COUNTIES FROM OCT. 1, 1912, TO SEPT. 30, 1913, ARRANGED ACCORDING TO SEX, NATIVITY, PLACE OF MARRIAGE, NUMBER OF CHILDREN, AND DURATION OF MARRIAGE.

County.	Sex of complainant.	Number of divorces.	Nativity of plaintiff.			Nativity of defendant.		
			Native born.	Foreign born.	Unknown	Native born.	Foreign born.	Unknown
Washburn	Total	13	3	2	8	4	.....	9
	Male	3	1	1	1	2	.....	8
	Female	10	2	1	7	2	.....	1
Washington	Total	3	2	1	.....	2	.....	1
	Male	1	.....	1	.....	2	.....	.....
	Female	2	2	.....	.....	.....	.....	1
Waukesha	Total	33	30	3	.....	27	5	1
	Male	6	4	2	.....	22	4	1
	Female	27	26	1	.....	5	1	.....
Waupaca	Total	22	15	7	.....	13	9	.....
	Male	3	2	1	.....	11	8	.....
	Female	19	13	6	.....	2	1	.....
Waushara	Total	3	.....	.....	3	.....	.....	3
	Male	1	.....	.....	1	.....	.....	2
	Female	2	.....	.....	2	.....	.....	1
Winnebago	Total	69	.....	.....	69	.....	.....	69
	Male	13	.....	.....	13	.....	.....	56
	Female	56	.....	.....	56	.....	.....	13
Wood	Total	22	.....	1	21	.....	1	21
	Male	6	.....	1	5	.....	.....	16
	Female	16	.....	.....	16	.....	1	5
Total	.....	1,391	871	266	254	802	294	295

TABLE NO. 21—Continued. SHOWING DIVORCES IN WISCONSIN BY COUNTIES FROM OCT. 1, 1912, TO SEPT. 30, 1913, ARRANGED ACCORDING TO SEX, NATIVITY, PLACE OF MARRIAGE, NUMBER OF CHILDREN AND DURATION OF MARRIAGE.

County.	Place of marriage.				Gainful occupation of plaintiff.	Case contested.	Alimony.		Number of children in family.											Duration of marriage.									
	Wisconsin.	United States.	Foreign countries.	Unknown.			Alimony asked.	Alimony granted.	No children.	1	2	3	4	5	6	7	8	9	10+	Not stated.	Under 6 mos.	Under 1 yr.	1-4 yrs.	5-9 yrs.	10-19 yrs.	20-29 yrs.	30+	Not stated.	Cases pending.	Decree denied.
Adams	1	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....
Ashland	11	5	....	....	3	....	8	4	8	3	4	....	....	1	....	....	....	....	....	....	3	2	3	4	3	....	....	1	....	....
Barron	4	2	....	1	....	1	....	....	2	1	2	1	1	....	....	....	....	....	....	....	....	....	3	1	3	....	....	....	....	....
Bayfield	5	4	....	....	2	....	....	....	3	3	2	1	....	....	....	....	....	....	....	....	2	1	2	2	2	....	....	....	....	....
Brown	20	5	....	....	7	2	11	11	9	8	1	1	5	1	....	....	....	....	....	....	2	....	11	4	6	2	....	....	....	....
Buffalo	2	....	....	....	1	....	1	1	1	....	....	....	1	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....
Burnett	1	1	....	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....
Calumet	3	....	....	....	....	2	1	1	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	1	....	....
Chippewa	5	1	....	....	4	....	3	3	2	3	1	....	....	....	....	....	....	....	....	....	....	....	1	2	....	1	....	2	....	....
Clark	23	2	2	....	7	2	8	5	11	5	3	3	1	2	2	....	....	....	....	....	5	1	6	2	5	7	1	....	....	....
Columbia	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Crawford	15	1	....	1	7	1	5	7	7	2	2	1	2	2	....	....	....	1	....	....	1	2	1	6	6	1	....	....	....	....
Dane	39	14	1	....	11	8	20	15	26	12	7	3	4	1	....	....	....	....	....	1	7	3	16	10	8	4	1	5	....	1
Dodge	9	3	....	....	2	3	5	4	8	....	1	....	2	....	1	....	....	....	....	....	1	2	2	4	2	1	....	....	....	....
Door	3	....	....	....	....	....	....	....	1	1	....	....	....	....	....	1	....	....	....	....	....	....	....	....	3	....	....	....	....	....
Douglas	24	22	5	....	31	7	18	15	23	14	7	2	1	3	1	....	....	....	....	....	6	1	13	19	10	2	....	....	....	....
Dunn	9	2	....	3	1	5	5	2	4	4	2	1	....	2	1	....	....	....	....	....	....	2	....	2	1	5	1	3	....	....
Eau Claire	11	4	1	2	3	....	8	4	6	4	2	....	2	....	1	1	....	....	....	2	1	1	6	4	1	2	3	....	....	....
Florence	....	....	2	....	2	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....
Fond du Lac	14	3	....	2	3	3	8	5	10	4	1	....	3	....	....	1	....	....	....	....	2	4	4	2	6	1	....	....	....	....
Forest	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Grant	11	5	....	....	13	2	7	7	5	8	1	2	....	....	....	....	....	....	....	....	3	....	9	2	2	....	....	....	....	....
Green	9	4	....	....	....	....	5	5	5	4	....	1	....	....	1	....	1	....	....	1	1	....	5	2	3	2	....	....	....	....
Green Lake	6	....	1	....	....	....	5	5	2	2	....	3	....	....	....	....	....	....	....	....	....	....	2	3	....	1	....	1	....	....
Iowa	7	2	....	....	2	....	9	9	2	4	1	1	....	....	....	....	....	....	1	....	....	....	3	1	4	1	....	....	....	....

TABLE NO. 21—Concluded. SHOWING DIVORCES IN WISCONSIN BY COUNTIES FROM OCT. 1, 1912, TO SEPT. 30, 1913, ARRANGED ACCORDING TO SEX, NATIVITY, PLACE OF MARRIAGE, NUMBER OF CHILDREN AND DURATION OF MARRIAGE.

County.	Place of marriage.				Guilty occupation of plaintiff.	Case contested.	Alimony.		Number of children in family.											Duration of marriage.									
	Wisconsin.	United States.	Foreign countries.	Unknown.			Alimony asked.	Alimony granted.	No. children.	1	2	3	4	5	6	7	8	9	10+	Not stated.	Under 6 months.	Under 1 year.	1-4 years.	5-9 years.	10-19 years.	20-29 years.	30+	Not stated.	Cases pending.	Decree denied.
Iron	4	2	1	....	....	1	2	1	1	3	1	1	1	....	....	....	....	....	....	....	....	....	2	1	2	....	....	2	....	....
Jackson	5	1	....	....	4	....	1	1	3	1	1	....	....	....	1	....	....	....	....	....	....	....	2	2	2	....	....	....	....	....
Jefferson	19	4	3	....	18	2	8	6	15	3	4	1	2	1	....	....	....	....	....	....	5	....	7	7	5	1	1	....	....	....
Juneau	5	1	1	....	....	1	2	1	1	3	3	....	....	....	....	....	....	....	....	....	....	1	3	2	....	1	....	....	....	....
Kenosha	23	11	4	....	10	2	12	12	19	10	4	1	1	1	1	....	....	....	....	1	6	3	7	10	5	4	1	2	....	....
Kewaunee	1	....	....	....	1	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....
La Crosse	15	7	....	1	7	5	10	10	15	1	3	3	1	....	....	....	....	....	....	....	3	....	7	5	3	5	....	....	....	....
La Fayette	5	4	....	....	6	1	6	4	3	4	1	1	....	....	....	....	....	....	....	....	2	....	3	2	1	....	....	1	....	....
Langlade	14	2	....	....	4	1	6	5	10	2	4	....	....	....	....	....	....	....	....	....	4	....	5	3	2	1	1	....	5	1
Lincoln	13	1	....	....	....	3	8	9	6	2	3	1	....	....	....	1	1	....	....	....	2	1	5	1	1	4	....	....	....	....
Manitowoc	9	5	....	....	3	4	4	3	6	3	1	3	1	....	....	....	....	....	....	....	....	....	3	5	5	....	....	1	....	....
Marathon	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Marinette	6	9	....	1	4	....	6	6	6	2	2	1	2	1	1	....	....	....	....	1	4	....	4	2	4	1	....	1	....	....
Marquette	1	....	....	....	....	....	1	1	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....
Milwaukee	172	58	30	1	88	23	127	114	123	66	36	14	8	3	3	2	3	....	1	2	44	16	68	66	46	18	3	....	....	....
Monroe	9	2	....	....	3	....	2	2	5	2	1	2	1	....	....	....	....	....	....	....	1	1	2	1	4	2	....	....	....	....
Oconto	7	4	....	2	2	4	7	7	6	2	2	2	....	....	....	....	1	....	....	....	2	....	1	1	4	1	....	4	....	....
Oneida	8	1	....	....	3	1	3	3	4	2	2	1	....	....	....	....	....	....	....	....	....	1	4	2	2	....	....	....	....	....
Outagamie	43	10	1	....	7	9	26	23	25	8	10	2	3	3	1	....	....	1	1	....	4	3	16	14	9	7	1	....	....	....
Ozaukee	6	2	....	....	....	....	3	1	3	3	....	1	1	....	....	....	....	....	....	....	3	....	....	1	1	....	1	2	....	....
Pepin	....	1	....	....	....	....	1	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....
Pierce	5	3	....	....	....	1	1	....	3	3	....	....	....	1	1	....	....	....	....	....	1	....	3	....	1	2	....	1	....	....
Polk	....	1	....	....	....	1	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....
Portage	21	2	1	....	....	5	10	9	12	7	2	....	....	2	....	....	....	....	1	....	3	2	8	2	8	....	1	....	....	....
Price	7	2	....	....	2	....	1	1	3	3	1	1	1	....	....	....	....	....	....	....	4	....	2	....	1	2	....	....	....	....

Racine	71	53	16	....	45	14	48	39	65	34	16	12	4	5	1	1	1	....	....	1	17	13	39	31	31	9	....	....	....	....
Richland	13	1	....	7	2	3	13	12	7	6	3	2	3	....	....	....	....	....	....	....	....	1	6	2	3	....	....	9	....	....
Rock	37	31	3	....	1	2	20	13	23	20	10	9	2	....	2	1	1	1	....	2	2	5	20	13	20	7	....	4	....	....
Rusk	5	1	....	....	1	....	4	3	....	4	1	....	....	....	....	....	1	....	....	....	1	....	2	1	1	1	....	....	....	....
St. Croix	6	2	1	....	....	2	4	5	4	1	1	....	....	2	....	....	1	....	....	....	....	1	2	3	1	1	1	....	....	....
Sauk	21	5	3	....	12	3	8	6	11	5	7	1	2	....	2	1	....	....	....	....	4	1	8	2	6	3	3	2	....	....
Sawyer	1	....	....	1	....	....	2	2	....	1	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	1	....	....
Shawano	9	2	....	....	2	1	3	3	5	2	3	....	....	1	....	....	....	....	....	....	1	....	4	1	3	2	....	....	....	....
Sheboygan	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Taylor	3	....	1	1	....	1	1	....	3	1	1	....	....	....	....	....	....	....	....	....	....	....	1	1	1	1	1	....	....	....
Trempealeau	4	4	....	....	1	....	2	3	....	3	2	2	....	1	....	....	....	....	....	....	....	....	1	3	1	1	....	2	....	....
Vernon	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Vilas	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Walworth	7	6	1	....	....	1	3	3	3	3	3	2	....	....	....	....	....	....	....	3	....	2	4	1	3	3	....	1	....	....
Washburn	9	3	1	....	2	....	3	2	5	4	....	....	1	1	1	1	....	....	....	....	3	....	2	3	2	....	....	3	2	1
Washington	2	1	....	....	....	1	1	....	....	2	....	1	....	....	....	....	....	....	....	....	....	....	....	1	1	1	....	....	....	....
Waukesha	27	5	1	....	6	5	15	13	17	9	3	2	1	1	....	....	....	....	....	....	6	4	9	5	4	4	1	....	....	....
Waupaca	18	2	1	1	1	....	10	10	7	3	4	4	4	....	....	....	....	....	....	....	2	....	5	6	5	3	1	....	....	....
Waushara	2	1	....	....	....	....	2	2	....	1	....	1	....	1	....	....	....	....	....	....	1	....	....	....	....	2	....	....	....	....
Winnebago	60	15	2	2	....	2	36	24	28	20	11	5	2	2	....	....	1	....	....	....	3	5	16	8	13	6	1	17	....	....
Wood	15	5	1	1	4	1	10	8	6	3	5	1	....	1	2	1	....	....	1	2	1	....	6	6	5	3	....	1	....	....
Total	930	350	84	27	338	136	559	470	595	335	189	97	64	40	24	11	11	3	5	17	164	79	366	287	275	127	26	67	7	3

DEATHS.

During the calendar year of 1912, 27,000 deaths were reported to the State Bureau of Vital Statistics; for 1913, 27,858 deaths were recorded. This gives a death rate per one thousand gross estimated population of 11.3 for 1912 and 11.5 for 1913.

Investigations prove that the registration of deaths in Wisconsin is more than 98 per cent correct. We therefore feel that we have reasons to congratulate ourselves on the very low death rate for this biennial period. Only four states in the registration area for the period of time covered by this report show a lower death rate than Wisconsin. These are comparatively new states and we might naturally expect a lower death rate on account of the age grouping of the population.

Table No. 22, shows the total deaths reported in Wisconsin by calendar years since 1903. In studying this table we should constantly keep in mind that the very material increase in the number of deaths registered is due entirely to increased accuracy of registration and not to any increase in the prevalence of any of the so-called preventable diseases.

Table No. 23, shows the deaths reported by counties, arranged according to color, sex, conjugal condition and age grouping for 1912.

Table No. 24, shows the deaths by counties according to color, sex, conjugal condition and age groups for 1913.

From an examination of the tables showing deaths by age groups for each county, we find that for the calendar year of 1912, 6,573 deaths under four years of age were recorded; for 1913 there were 6,773 deaths under four years of age. This constitutes about 25 per cent of the total deaths reported and emphasizes the necessity for a more vigorous campaign in preventing this great loss in child life.

Table No. 25, shows deaths reported for 1912 and 1913, arranged according to the month in which death occurred.

Table No. 26, shows causes of death arranged according to age groups for 1912 and 1913.

Table No. 27, shows the total deaths for each county from Jan. 1, 1912 to Dec. 31, 1913, arranged according to causes.

Tuberculosis leads the list in the number of deaths reported, with the total of 4,690 deaths. Organic heart disease is second with a total of 4,279; pneumonia third with a total of 4,238; apoplexy fourth with a total of 2,914 and senility fifth with a total of 2,765.

Table No. 28, shows causes of death in Wisconsin for 1912 and 1913, arranged according to color, sex, conjugal condition and nativity.

The table showing causes of death classified by months will reveal at a glance the seasonal variation of the various diseases, particularly the various communicable diseases. Scarlet fever, measles and diphtheria are most prevalent during the school months which proves that the schools are an important factor in the spread of these diseases. Influenza and pneumonia are most prevalent during the winter and spring months and diarrhea and enteritis under two years of age during the months of August and September. The deaths from tuberculosis by age groups as shown in Table No. 26, should be carefully studied to understand the great economic loss from this easily preventable disease. Practically 90 per cent of the deaths from tuberculosis occur between the ages of 20 and 40 years.

Tables No. 29, 30 and 31, show deaths reported in cities by important age groups and certain causes of deaths for the calendar years of 1911, 1912 and 1913.

Table No. 29, was inadvertently omitted from the 1911 and 1912 biennial report and is therefore published now for the first time.

The death rate for the cities of the state is somewhat higher than the rate for the state as a whole but a considerable part of this increase is due to deaths among nonresidents who come to the city for treatment on account of the hospital facilities.

The following table shows death rates for the 5 largest cities in Wisconsin during the last 3 years:

	1911	1912	1913
Milwaukee	12.6	14.0	13.9
Superior	11.9	9.8	12.5
Racine	12.2	13.3	13.4
Oshkosh	14.2	12.9	13.5
La Crosse	13.8	13.8	14.5

TABLE NO. 22.—DEATHS IN WISCONSIN BY CALENDAR YEARS.

	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913
Adams	70	77	60	72	89	91	77	90	91	104	103
Ashland	318	312	318	332	373	313	376	355	298	268	287
Barron	250	204	247	227	252	310	288	316	277	274	297
Bayfield	18	49	107	108	99	108	135	169	143	116	111
Brown	737	579	640	741	712	883	801	789	818	706	753
Buffalo	69	72	79	99	159	178	150	158	154	139	127
Burnett	75	72	72	71	95	107	94	89	87	87	92
Calumet	162	140	177	153	208	166	178	162	162	133	160
Chippewa	263	226	370	367	363	413	436	436	394	362	385
Clark	170	168	198	207	243	296	273	261	234	230	254
Columbia	325	288	334	362	389	324	367	395	356	363	382
Crawford	81	92	152	110	111	211	201	190	170	182	203
Dane	882	744	773	782	858	909	868	935	912	840	938
Dodge	515	444	503	505	471	504	466	522	532	484	528
Door	183	173	204	204	189	182	186	186	203	180	158
Douglas	389	440	433	474	469	441	461	518	514	446	580
Dunn	225	188	254	255	235	315	264	249	255	222	235
Eau Claire	345	342	432	255	364	367	371	400	380	360	423
Florence	34	29	24	21	33	21	24	26	26	26	33
Fond du Lac	516	510	567	544	617	629	635	615	652	678	631
Forest	18	22	30	43	49	58	55	63	76	71	62
Grant	339	320	357	350	410	434	435	436	422	423	402
Green	233	233	256	231	226	253	224	214	252	193	234
Green Lake	126	105	139	142	169	200	198	172	165	145	193
Iowa	179	163	223	240	279	246	243	233	208	225	204
Iron	88	97	102	97	106	103	113	80	83	91	99
Jackson	197	185	172	142	185	227	200	167	162	182	170
Jefferson	413	413	397	388	343	392	377	400	383	422	406
Juneau	234	234	164	208	218	265	236	239	201	218	220
Kenosha	288	277	340	381	407	384	348	381	416	485	387
Kewaunee	196	224	197	193	194	219	211	189	219	185	177
La Crosse	542	523	522	535	560	570	509	594	578	538	579
Lafayette	214	176	135	191	205	201	226	198	204	210	167
Langlade	99	113	180	110	138	156	136	161	168	149	165
Lincoln	155	131	167	229	242	211	230	217	184	167	165
Manitowoc	600	600	600	574	548	541	507	479	462	490	494
Marathon	.....	418	438	464	567	624	567	686	636	582	556
Marinette	322	268	404	451	323	373	391	356	326	373	330
Marquette	129	71	114	107	134	122	123	135	121	100	119
Milwaukee	5,638	4,740	5,284	5,659	6,641	6,002	3,134	6,570	5,967	6,528	6,627
Monroe	252	232	304	269	292	323	298	366	342	262	317
Oconto	218	181	208	233	210	285	263	254	243	229	234
Oneida	101	109	109	109	115	145	127	112	115	114	64
Outagamie	508	454	583	566	674	564	534	601	542	484	584
Ozaukee	171	150	172	169	205	205	197	151	161	182	174
Pepin	83	73	61	81	71	64	67	73	84	82	87
Pierce	134	121	141	146	178	243	234	250	253	220	234
Polk	144	114	181	200	222	234	196	185	208	200	206
Portage	361	304	361	383	407	481	372	375	354	332	336
Price	56	56	78	68	72	121	79	99	113	126	115
Racine	756	641	687	688	744	625	658	756	687	710	714
Richland	177	163	179	203	230	238	222	182	201	221	165
Rock	449	437	674	530	611	684	684	672	689	697	662
Rusk	32	31	41	35	92	88	96	98	97	114	128
St. Croix	142	140	170	216	284	278	269	278	282	259	282
Sauk	375	353	325	325	378	356	391	371	380	334	336
Sawyer	19	18	36	68	62	63	66	70	63	63	74
Shawano	242	212	155	239	293	361	321	310	295	316	346
Sheboygan	623	432	507	626	708	654	616	650	626	602	680
Taylor	87	91	79	68	88	168	121	113	102	139	145
Trempealeau	191	172	204	198	252	281	242	229	229	212	234
Vernon	149	134	160	140	208	332	278	310	291	285	244
Vilas	30	35	26	14	15	43	29	37	54	40	35
Walworth	402	322	361	329	427	393	381	362	371	366	392
Washburn	50	36	66	42	78	79	80	84	72	73	87
Washington	247	220	249	276	271	274	249	243	227	258	248
Waukesha	430	328	454	490	457	453	484	507	522	458	485
Waupaca	362	244	425	388	385	414	405	407	394	379	395
Waushara	113	100	127	132	119	214	215	178	153	177	192
Winnebago	711	548	715	721	731	861	769	782	856	765	856
Wood	221	232	182	263	262	348	323	277	288	324	371
Total	23,673	21,142	24,178	24,734	27,514	28,222	27,380	28,213	27,185	27,000	27,858

TABLE NO. 23. SHOWING DEATHS BY COUNTIES DURING CALENDAR YEAR OF 1912, ARRANGED ACCORDING TO COLOR, SEX, CONJUGAL CONDITION AND AGE GROUPS.

Counties.	Total.	Color.				Sex.			Conjugal condition.				
		White.	Black.	Indian.	Unknown.	Male.	Female.	Unknown.	Single.	Married.	Widowed.	Divorced.	Unknown.
Adams	104	104	.....	.....	.....	62	42	.....	39	43	20	.....	2
Ashland	268	247	1	20	.....	174	94	.....	156	84	16	.....	12
Barron	274	273	.....	1	.....	139	135	.....	119	98	54	.....	3
Bayfield	116	109	.....	7	.....	68	48	.....	63	36	15	2	.....
Brown	706	683	3	20	.....	390	316	.....	350	231	114	7	4
Buffalo	139	139	.....	.....	.....	82	57	.....	45	64	29	.....	1
Burnett	87	85	.....	2	.....	50	37	.....	34	41	12	.....	.....
Calumet	133	132	.....	1	.....	76	57	.....	56	45	28	4	.....
Chippewa	362	362	.....	.....	.....	207	155	.....	169	117	62	1	13
Clark	230	230	.....	.....	.....	122	108	.....	94	90	45	.....	1
Columbia	363	362	1	.....	.....	204	159	.....	104	139	112	6	2
Crawford	182	181	.....	.....	1	94	88	.....	65	75	40	.....	2
Dane	840	834	6	.....	.....	448	392	.....	280	349	193	9	9
Dodge	484	482	2	.....	.....	269	215	.....	190	178	109	1	6
Door	180	180	.....	.....	.....	88	92	.....	74	71	31	2	2
Douglas	446	440	4	2	.....	264	182	.....	236	147	45	3	15
Dunn	222	222	.....	.....	.....	109	113	.....	82	92	44	1	3
Eau Claire	360	359	1	.....	.....	192	168	.....	113	161	80	3	3
Florence	26	26	.....	.....	.....	15	11	.....	13	6	6	1	.....
Fond du Lac	678	677	1	.....	.....	353	325	.....	226	275	161	5	11
Forest	71	70	.....	1	.....	48	23	.....	48	17	5	.....	1
Grant	423	421	2	.....	.....	233	190	.....	127	186	104	4	2
Green	193	192	1	.....	.....	106	87	.....	62	85	42	1	3
Green Lake	145	145	.....	.....	.....	72	73	.....	40	63	41	1	.....
Iowa	225	225	.....	.....	.....	119	106	.....	72	83	68	.....	2
Iron	91	91	.....	.....	.....	58	33	.....	55	29	6	1	.....
Jackson	182	178	2	2	.....	98	84	.....	73	69	40	.....	.....
Jefferson	422	422	.....	.....	.....	228	194	.....	130	186	102	3	1
Juneau	218	218	.....	.....	.....	124	94	.....	64	100	54	.....	.....
Kenosha	485	485	.....	.....	.....	267	218	.....	272	130	79	3	1

TABLE NO. 23.—Continued. SHOWING DEATHS BY COUNTIES DURING CALENDAR YEAR OF 1912, ARRANGED ACCORDING TO COLOR, SEX CONJUGAL CONDITION AND AGE GROUPS.

Counties.	Total.	Color.				Sex.			Conjugal condition.				
		White.	Black.	Indian.	Unknown.	Male.	Female.	Unknown.	Single.	Married.	Widowed.	Divorced.	Unknown.
Kewaunee	185	185	.....	.....	.....	103	82	.....	70	59	54	1	1
La Crosse	538	538	.....	.....	.....	311	227	.....	190	217	122	2	7
La Fayette	210	210	.....	.....	.....	122	88	.....	65	75	62	2	6
Langlade	149	148	1	.....	.....	87	62	.....	69	58	25	2	1
Lincoln	167	167	.....	.....	.....	96	71	.....	77	53	30	3	4
Manitowoc	490	490	.....	.....	.....	257	233	.....	191	161	131	5	2
Marathon	582	582	.....	.....	.....	322	260	.....	281	208	88	3	2
Marinette	373	373	.....	.....	.....	216	157	.....	169	136	57	2	9
Marquette	100	100	.....	.....	.....	59	41	.....	35	45	20	.....	.....
Milwaukee	6,528	6,510	17	.....	1	3,675	2,853	.....	3,250	2,032	1,140	52	54
Monroe	262	261	.....	1	.....	132	130	.....	84	107	65	1	5
Oconto	229	225	2	1	1	131	98	.....	110	75	36	1	7
Oneida	114	114	.....	.....	.....	71	43	.....	54	41	18	.....	1
Outagamie	484	474	.....	10	.....	249	235	.....	177	174	128	4	1
Ozaukee	182	182	.....	.....	.....	98	84	.....	68	72	41	1	.....
Pepin	82	82	.....	.....	.....	46	36	.....	21	37	24	.....	.....
Pierce	220	220	.....	.....	.....	112	108	.....	68	85	66	1	.....
Polk	200	199	1	.....	.....	100	100	.....	65	85	49	1	.....
Portage	332	331	1	.....	.....	172	160	.....	147	116	64	3	2
Price	126	125	.....	1	.....	83	43	.....	63	39	18	1	5
Racine	710	705	4	1	.....	382	328	.....	319	278	103	.....	10
Richland	221	221	.....	.....	.....	125	96	.....	77	84	54	3	3
Rock	697	694	1	.....	2	375	322	.....	220	272	182	7	16
Rusk	114	113	.....	1	.....	74	40	.....	61	39	9	1	4
St. Croix	259	256	2	.....	1	141	118	.....	90	111	54	1	3

Sauk	334	333	.....	.....	1	181	153	.....	89	149	89	1	6
Sawyer	63	47	.....	16	.....	34	29	.....	35	22	4	1	1
Shawano	316	266	.....	50	.....	137	179	.....	138	111	63	2	2
Sheboygan	602	601	.....	.....	1	324	278	.....	233	229	134	2	4
Taylor	139	139	.....	.....	.....	77	62	.....	62	56	18	3	.....
Trempealeau	212	212	.....	.....	.....	114	98	.....	70	82	58	.....	2
Vernon	285	283.	1	.....	1	145	140	.....	120	78	79	1	7
Vilas	40	40	.....	.....	.....	23	17	.....	26	11	1	.....	2
Walworth	366	366	.....	.....	.....	193	173	.....	108	145	101	7	5
Washburn	73	68	1	1	3	41	31	1	26	32	13	1	1
Washington	258	257	.....	.....	1	154	104	.....	90	92	72	1	3
Waukesha	458	458	.....	.....	.....	247	211	.....	176	148	128	2	4
Waupaca	379	379	.....	.....	.....	207	172	.....	97	160	116	4	2
Waushara	177	177	.....	.....	.....	87	90	.....	88	56	31	1	1
Winnebago	765	763	2	.....	.....	379	386	.....	261	300	187	12	5
Wood	324	324	.....	.....	.....	191	133	.....	127	137	59	.....	1
Total	27,000	26,792	57	138	13	14,832	12,167	1	11,212	9,757	5,550	193	288

TABLE NO. 23.—Concluded. SHOWING DEATHS BY COUNTIES DURING CALENDAR YEAR OF 1912, ARRANGED ACCORDING TO COLOR, SEX, CONJUGAL CONDITION AND AGE GROUPS.

Counties.	Age Grouping.														
	Under 2 mos.	Under 1 yr.	1-4	5-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	Age unknown.
Adams	13	3	2	.....	5	8	5	5	11	14	19	12	3	.....	3
Ashland	40	19	18	10	11	17	33	28	38	29	13	8	.....	.....	4
Barron	42	21	13	6	12	23	16	12	30	28	36	30	4	.....	1
Bayfield	18	9	9	4	6	7	8	10	12	12	10	10	.....	.....	1
Brown	23	104	33	20	21	42	43	46	56	70	76	62	9	.....	1
Buffalo	13	6	6	5	8	6	11	11	8	14	28	18	4	.....	1
Burnett	13	5	3	1	5	10	.....	2	12	12	17	6	1	.....	.....
Calumet	19	7	8	2	3	8	6	7	15	21	17	15	4	.....	1
Chippewa	34	18	13	13	34	52	24	16	34	45	49	28	1	.....	1
Clark	40	13	9	5	15	9	17	11	21	28	39	19	4	.....	.....
Columbia	26	11	9	4	12	20	17	28	31	51	74	65	14	.....	1
Crawford	23	11	10	2	6	6	8	19	15	23	26	25	6	.....	2
Dane	69	31	31	11	31	53	51	82	107	97	134	126	15	.....	2
Dodge	59	23	30	19	17	20	23	25	40	56	90	72	8	.....	2
Door	24	8	9	5	7	13	13	16	10	35	22	16	2	.....	.....
Douglas	53	43	21	17	20	47	55	57	57	27	30	14	5	.....	.....
Dunn	24	18	9	5	13	10	9	7	22	41	42	21	1	.....	.....
Eau Claire	27	10	6	12	11	30	30	27	47	66	61	26	7	.....	.....
Florence	3	.....	.....	.....	4	3	2	3	3	6	2	.....	.....	.....	.....
Fond du Lac	69	28	25	5	21	32	41	58	55	92	139	95	16	.....	2
Forest	14	8	8	1	4	8	8	4	6	6	3	1	.....	.....	.....
Grant	40	21	17	6	16	22	21	29	48	51	86	56	10	.....	.....
Green	18	9	3	6	4	12	9	16	15	33	35	24	8	.....	1
Green Lake	12	6	2	.....	5	5	8	11	12	21	27	27	9	.....	.....
Iowa	19	10	9	3	1	15	18	9	15	38	50	32	6	.....	.....
Iron	21	8	9	2	2	10	4	14	10	6	5	.....	.....	.....	.....
Jackson	24	7	5	6	7	12	13	9	18	26	38	15	1	.....	1
Jefferson	33	15	15	10	13	22	24	32	38	46	86	77	11	.....	.....
Juneau	17	9	5	5	5	14	15	10	28	39	45	21	5	.....	.....
Kenosha	50	66	69	27	24	34	27	25	33	46	39	40	5	.....	.....

Kewaunee	27	14	5	1	6	12	7	5	8	24	39	32	5	.....	.....
La Crosse	38	22	21	9	21	44	32	48	77	80	91	46	6	.....	3
La Fayette	22	6	12	4	8	14	15	7	20	13	47	28	14	.....	.....
Langlade	23	12	9	4	9	8	11	10	11	21	15	13	1	.....	2
Lincoln	25	10	10	5	8	16	3	15	17	24	20	12	2	.....	.....
Manitowoc	57	29	19	13	22	34	24	33	44	49	76	76	13	.....	1
Marathon	81	56	46	22	29	40	38	41	52	65	69	36	4	.....	3
Marinette	41	32	26	14	21	23	28	35	32	44	48	24	2	.....	3
Marquette	12	3	7	4	2	6	1	10	9	16	8	17	4	.....	1
Milwaukee	763	795	518	167	261	541	518	529	612	697	716	351	54	2	4
Monroe	19	12	14	9	10	12	17	10	24	40	54	35	5	.....	1
Oconto	37	17	10	8	14	16	13	11	21	20	41	14	4	.....	3
Oneida	15	9	5	3	7	12	11	8	9	19	13	3	.....	.....	.....
Outagamie	51	30	23	16	18	40	23	26	43	54	81	71	5	.....	3
Ozaukee	19	17	8	4	6	6	7	18	12	18	38	28	1	.....	.....
Pepin	6	6	3	1	3	5	2	5	8	16	16	10	1	.....	.....
Pierce	24	5	6	2	10	8	8	11	28	27	46	40	5	.....	.....
Polk	25	4	6	5	8	13	11	13	9	33	40	29	3	.....	1
Portage	59	17	26	5	14	20	22	11	27	42	41	39	7	1	1
Price	18	13	10	5	5	12	9	6	9	14	17	7	.....	.....	1
Racine	75	61	33	18	24	61	58	54	61	89	101	66	8	.....	1
Richland	28	13	15	2	8	13	6	6	29	27	25	38	10	.....	1
Rock	61	27	24	13	20	37	42	49	74	97	119	107	18	.....	9
Rusk	22	7	9	4	8	11	8	8	11	12	8	6	.....	.....	.....
St. Croix	30	9	8	6	12	20	15	18	29	35	43	29	4	.....	1
Sauk	25	13	11	4	9	16	19	18	31	43	70	60	13	1	1
Sawyer	10	5	4	.....	5	7	7	8	2	7	5	2	.....	.....	1
Shawano	56	22	14	13	17	22	15	20	19	40	39	33	6	.....	.....
Sheboygan	82	36	23	12	29	31	31	51	62	65	94	78	8	.....	.....
Taylor	20	12	8	3	5	14	8	9	13	28	13	5	1	.....	.....
Trempealeau	15	7	9	4	13	19	8	10	19	22	53	29	4	.....	.....
Vernon	38	18	75	6	15	14	15	18	14	28	42	46	13	.....	3
Vilas	7	3	7	2	3	3	3	5	3	3	1	.....	.....	.....	.....
Walworth	19	15	11	5	13	24	16	17	43	49	79	56	17	1	1
Washburn	8	4	6	.....	6	2	4	7	9	12	11	4	.....	.....	.....
Washington	22	20	8	3	7	11	16	11	22	45	36	48	8	.....	1
Waukesha	38	21	19	4	24	31	20	33	37	75	72	68	14	.....	2
Waupaca	33	10	9	8	11	23	14	21	22	51	98	64	13	.....	2
Waushara	28	6	26	7	11	6	5	11	14	14	27	19	3	.....	.....
Winnebago	82	31	25	11	31	49	48	65	81	105	125	92	18	1	1
Wood	30	17	15	12	17	27	26	25	26	40	57	29	1	.....	2
Total	3,071	2,013	1,489	650	1,113	1,893	1,743	1,945	2,540	3,282	3,972	2,752	454	6	77

TABLE NO. 24. SHOWING DEATHS BY COUNTIES DURING THE CALENDAR YEAR OF 1913, ARRANGED ACCORDING TO COLOR, SEX, CONJUGAL CONDITION AND AGE GROUPS.

Counties.	Total.	Color.				Sex.			Conjugal condition.				
		White.	Black.	Indian.	Unknown.	Male.	Female.	Unknown.	Single.	Married.	Widowed.	Divorced.	Unknown.
Adams	103	103	.....	.....	.....	58	45	.....	56	26	19	1	1
Ashland	287	274	.....	13	.....	200	87	.....	143	95	29	7	13
Barron	297	297	.....	.....	.....	154	143	.....	135	114	41	3	4
Bayfield	111	106	.....	4	1	61	50	.....	52	40	14	1	4
Brown	751	745	1	5	.....	374	377	.....	359	232	145	5	10
Buffalo	127	127	.....	.....	.....	64	63	.....	59	34	32	1	1
Burnett	92	92	.....	.....	.....	50	42	.....	37	37	17	1	.....
Calumet	160	156	1	3	.....	86	74	.....	56	74	27	2	1
Chippewa	385	381	3	1	.....	239	146	.....	176	122	76	1	10
Clark	254	254	.....	.....	.....	151	103	.....	106	96	44	3	5
Columbia	382	382	.....	.....	.....	200	182	.....	118	153	102	2	7
Crawford	203	203	.....	.....	.....	113	90	.....	67	83	44	2	7
Dane	938	935	3	.....	.....	537	400	1	338	377	212	5	6
Dodge	528	528	.....	.....	.....	300	228	.....	193	206	123	6	.....
Door	158	158	.....	.....	.....	102	56	.....	63	61	30	.....	4
Douglas	580	573	3	4	.....	353	227	.....	359	187	22	5	7
Dunn	235	235	.....	.....	.....	144	91	.....	89	91	53	1	1
Eau Claire	423	423	.....	.....	.....	234	189	.....	157	174	85	6	1
Florence	33	33	.....	.....	.....	22	11	.....	14	12	5	.....	2
Fond du Lac	631	630	1	.....	.....	351	280	.....	237	233	148	.....	13
Forest	62	61	.....	1	.....	41	21	.....	34	21	6	.....	1
Grant	402	400	.....	.....	2	233	169	.....	130	157	104	3	8
Green	234	233	.....	.....	1	129	105	.....	69	94	63	3	5
Green Lake	193	193	.....	.....	.....	102	91	.....	60	72	59	2	.....
Iowa	204	204	.....	.....	.....	108	96	.....	74	76	51	1	2
Iron	99	99	.....	.....	.....	58	41	.....	59	26	10	1	3
Jackson	170	170	.....	.....	.....	80	90	.....	61	63	45	.....	1
Jefferson	406	406	.....	.....	.....	208	198	.....	124	156	124	1	1
Juneau	220	219	.....	1	.....	123	97	.....	69	89	59	2	1
Kenosha	387	387	.....	.....	.....	220	167	.....	201	131	52	1	2

Kewaunee	177	177				90	87		76	55	41	3	2
La Crosse	579	576	3			323	256		204	232	127	4	12
La Fayette	167	167				92	75		60	63	42	1	1
Langlade	165	165				94	71		92	47	23	1	2
Lincoln	165	164		1		90	75		71	60	31	3	
Manitowoc	494	494				262	231	1	212	169	109	1	3
Marathon	556	555		1		333	223		278	192	84	1	1
Marinette	330	327		3		204	126		156	121	45	1	7
Marquette	119	118	1			67	52		37	50	32		
Milwaukee	6,627	6,607	19	1		3,846	2,781		3,015	2,404	1,106	56	46
Monroe	317	316	1			168	149		115	126	72	3	1
Oconto	234	233		1		123	111		99	82	45	1	7
Oneida	64	63	1			42	22		29	29	3	1	2
Outagamie	584	558	1	25		320	264		234	240	107	1	2
Ozaukee	174	174				98	76		71	51	50		2
Pepin	87	87				46	41		35	29	21	1	1
Pierce	234	233	1			124	110		75	101	56	2	
Polk	206	201	5			115	91		84	76	43	2	1
Portage	336	336				183	153		154	117	61	3	1
Price	115	115				70	45		55	38	18	1	3
Racine	714	708	4	2		396	318		286	278	137	4	9
Richland	165	164		1		89	76		58	59	46		2
Rock	662	660	1	1		370	291	1	242	232	173	10	5
Rusk	128	125	1	2		69	59		74	42	12		
St. Croix	282	282				158	124		97	106	72		7
Sauk	336	336				167	169		93	119	114	4	6
Sawyer	74	43		31		39	35		38	28	8		
Shawano	346	299	1	46		192	154		142	131	67	1	5
Sheboygan	680	680				378	302		283	249	145	2	1
Taylor	145	143	1	1		80	65		69	47	27		2
Trempealeau	234	233		1		141	93		83	90	56	2	3
Vernon	244	244				130	114		81	86	68	2	7
Vilas	35	35				21	14		24	5	4	1	1
Walworth	392	390		1	1	197	195		156	108	117	6	5
Washburn	87	85		2		54	33		52	24	9	1	1
Washington	248	247			1	137	111		87	97	57	3	4
Waukesha	485	484	1			263	222		168	190	119	4	4
Waupaca	395	395				228	167		120	147	125	2	1
Waushara	192	191			1	108	84		87	59	42	1	3
Winnebago	856	853	3			457	399		309	335	187	13	12
Wood	371	370	1			197	174		167	137	65		2
Total	27,856	27,640	57	152	7	15,656	12,197	3	11,563	10,183	5,607	208	295

TABLE NO. 24—Concluded. SHOWING DEATHS BY COUNTIES DURING THE CALENDAR YEAR 1913, ARRANGED ACCORDING TO COLOR, SEX, CONJUGAL CONDITION AND AGE GROUPS.

Counties.	Age Grouping.														
	Under 2 mos.	Under 1 yr.	1-4	5-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	Age unknown.
Adams	24	13	5	2	4	2	3	6	15	9	12	8	.....	.....	.....
Ashland	19	19	15	8	17	30	33	33	40	32	22	9	2	.....	8
Barron	41	23	17	12	21	20	17	25	28	33	34	21	5	.....	.....
Bayfield	19	13	4	4	2	6	7	11	8	16	12	5	1	.....	3
Brown	123	98	36	13	31	46	50	47	64	79	82	61	16	.....	5
Buffalo	18	1	13	2	9	5	4	5	8	13	25	19	2	.....	3
Burnett	13	5	3	2	3	6	5	6	5	17	17	10	.....	.....	.....
Calumet	20	11	5	4	10	4	7	14	18	24	20	20	3	.....	.....
Chippewa	33	26	8	15	38	40	28	20	36	42	49	42	7	.....	1
Clark	44	19	11	7	11	14	6	14	18	44	35	24	5	.....	2
Columbia	31	19	8	1	15	29	21	17	37	46	74	67	12	.....	5
Crawford	24	8	6	1	6	17	8	19	17	23	39	29	4	.....	2
Dane	64	42	34	17	20	88	79	80	108	128	135	115	23	.....	5
Dodge	58	27	26	8	22	26	27	28	50	67	95	76	17	.....	1
Door	16	9	8	4	5	13	7	8	10	24	34	15	3	.....	2
Douglas	50	72	46	8	16	62	79	62	69	57	34	18	6	.....	1
Dunn	29	11	9	4	7	18	16	15	24	23	39	31	8	.....	1
Eau Claire	32	18	29	8	23	34	20	33	54	62	69	34	6	.....	1
Florence	2	2	2	.....	1	4	2	4	4	2	6	3	1	.....	1
Fond du Lac	66	27	25	9	22	42	37	45	65	75	104	89	23	.....	2
Forest	10	5	4	2	3	5	5	9	6	9	2	1	1	.....	.....
Grant	37	21	15	5	9	16	22	27	31	70	77	55	14	.....	3
Green	25	9	11	2	5	11	9	12	18	37	52	30	10	.....	3
Green Lake	12	11	10	2	9	5	7	7	17	29	43	31	10	.....	.....
Iowa	21	6	3	2	9	11	10	14	27	22	42	28	8	.....	1
Iron	15	17	9	3	6	7	10	8	10	4	6	3	.....	.....	1
Jackson	14	11	10	4	9	11	7	8	18	17	32	23	6	.....	.....
Jefferson	27	11	11	7	26	23	21	24	25	66	83	68	13	.....	1
Juneau	18	7	21	4	5	7	9	14	22	39	33	28	13	.....	.....
Kenosha	52	49	26	9	20	33	33	28	32	40	35	23	6	.....	1

Kewaunee	23	17	9	5	12	11	6	3	11	18	30	27	3	.....	2
La Crosse	57	16	25	10	25	40	47	51	58	78	95	64	11	.....	2
La Fayette	18	8	5	1	3	13	6	15	19	21	33	17	7	.....	.....
Langlade	30	14	11	11	12	11	8	8	13	19	18	7	1	.....	3
Lincoln	29	11	5	4	5	12	10	23	17	20	18	8	2	.....	1
Manitowoc	60	32	25	6	24	43	26	21	50	64	69	57	16	.....	1
Marathon	93	62	36	17	30	35	37	32	46	57	69	35	5	.....	2
Marinette	48	23	17	17	22	19	15	20	36	44	41	25	2	.....	1
Marquette	12	5	5	4	4	4	5	12	13	11	19	19	6	.....	.....
Milwaukee	881	632	464	186	256	509	545	556	719	717	709	380	69	.....	4
Monroe	37	17	11	6	15	15	14	17	30	49	57	49	.....	.....	.....
Oconto	39	9	13	1	14	18	12	16	18	26	38	25	3	.....	2
Oneida	16	2	5	1	.....	4	7	10	5	5	7	1	.....	.....	1
Outagamie	69	45	30	17	29	31	33	40	59	82	87	53	9	.....	.....
Ozaukee	21	11	9	3	7	8	11	9	17	20	25	28	5	.....	.....
Pepin	8	3	6	3	9	6	3	5	2	10	17	12	3	.....	.....
Pierce	20	9	7	.....	8	12	9	18	20	29	57	40	5	.....	.....
Polk	31	9	7	10	7	13	9	10	19	29	36	20	4	.....	2
Portage	51	27	23	4	18	30	18	21	18	32	53	31	5	1	4
Price	18	13	7	1	1	13	5	13	10	16	10	6	.....	.....	2
Racine	77	50	37	17	23	55	63	56	83	89	93	54	13	.....	4
Richland	28	12	5	1	3	3	9	12	9	23	37	18	4	.....	1
Rock	54	29	22	24	20	49	37	42	70	94	110	94	13	.....	4
Rusk	21	14	17	4	6	10	10	9	15	13	5	4	.....	.....	.....
St. Croix	36	10	11	6	10	16	15	20	36	35	43	35	7	.....	2
Sauk	29	21	9	2	7	18	20	18	29	39	76	50	18	.....	.....
Sawyer	9	6	9	1	6	9	6	5	4	5	7	3	3	.....	1
Shawano	48	25	27	8	16	23	11	18	34	38	48	41	6	.....	3
Sheboygan	87	56	47	14	21	39	47	27	49	78	110	91	12	1	1
Taylor	25	17	8	4	9	3	11	10	6	12	23	14	2	.....	1
Trempealeau	29	7	18	5	4	14	8	11	19	34	43	39	3	.....	.....
Vernon	30	14	8	7	5	10	12	6	17	30	59	35	7	.....	4
Vilas	4	5	6	2	3	1	2	3	3	.....	3	2	.....	.....	1
Walworth	19	10	11	6	17	19	18	26	44	56	68	77	16	2	3
Washburn	17	8	7	3	4	8	3	5	12	5	10	5	.....	.....	.....
Washington	30	12	7	4	6	13	6	15	29	29	56	34	6	1	.....
Waukesha	25	16	14	8	31	53	29	34	47	61	96	55	12	.....	4
Waupaca	35	16	12	4	11	16	14	23	32	52	89	83	7	.....	1
Waushara	32	12	15	10	9	3	4	3	14	30	33	23	4	.....	.....
Winnebago	84	47	35	20	20	51	66	70	96	111	137	96	18	.....	5
Wood	46	27	26	12	18	31	26	24	38	38	48	32	5	.....	.....
Total	3,283	1,989	1,501	638	1,134	1,926	1,832	1,980	2,750	3,368	4,024	2,775	537	5	114

TABLE NO. 25. SHOWING CAUSES OF DEATH IN WISCONSIN FROM JAN. 1, 1912, TO DEC. 31, 1913, ARRANGED BY MONTHS.

Name of Disease.	Deaths by months.												
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Un.
I.													
General diseases:													
Typhoid fever	76	50	55	49	49	28	29	27	59	54	32	39	.....
Typhus fever	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Relapsing fever	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Malaria	.....	.....	.....	.....	.....	1	2	3	.....	.....	.....	.....	.....
Smallpox	1	2	2	.....	.....	1	.....	1	.....	.....	.....	.....	.....
Measles	23	17	31	44	101	55	14	12	3	10	12	15	.....
Scarlet fever	67	72	71	63	45	33	37	12	14	14	24	27	.....
Whooping cough	33	42	43	50	57	43	38	35	40	20	16	26	.....
Diphtheria and croup	65	43	53	41	43	33	39	33	35	60	72	55	.....
Influenza	160	113	98	50	44	18	6	5	9	19	23	66	.....
Miliary fever	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Asiatic cholera	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cholera nostras	2	3	1	1	.....	1	3	8	7	3	.....	1	.....
Dysentery	6	.....	3	2	4	3	2	14	23	5	3	4	.....
Plague	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....
Yellow fever	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Leprosy	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Erysipelas	14	17	17	22	20	8	8	6	6	1	6	12	.....
Other epidemic diseases	1	.....	3	.....	.....	.....	1	2	1	1	1	3	.....
Purulent infection and septicaemia	17	8	16	18	9	18	17	9	11	9	17	9	.....
Glanders	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Anthrax	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....
Rabies	.....	.....	.....	.....	.....	.....	1	.....	.....	1	.....	.....	.....
Tetanus	2	4	.....	5	5	4	5	15	5	5	1	3	.....
Mycoses	1	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....
Pellagra	.....	.....	1	.....	1	.....	1	.....	.....	2	.....	2	.....
Beriberi	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tuberculosis of the lungs	328	376	415	379	381	347	313	267	264	263	257	327	.....
Acute miliary tuberculosis	10	5	8	8	9	14	9	8	7	2	6	5	.....
Tuberculous meningitis	17	16	29	20	30	29	23	18	21	13	16	21	.....
Abdominal tuberculosis	16	19	16	27	20	23	26	16	15	11	11	17	.....
Pott's disease	2	4	4	4	9	7	2	10	2	3	4	2	.....
White swellings	2	1	1	1	1	2	.....	1	3	1	1	1	.....
Tuberculosis of other organs	4	2	5	6	6	7	7	1	1	4	2	5	.....

Disseminated tuberculosis	9	5	5	12	14	13	7	6	6	8	6	3	.....
Rickets	4	3	5	2	7	4	2	3	3	3	3	6	.....
Syphilis	9	12	11	12	14	11	10	10	10	8	7	9	.....
Gonococcus infection	2	.....	.....	1	1	1	.....	.....	.....	.....	.....	1	.....
Cancer of the buccal cavity	6	4	10	8	8	9	11	3	8	4	8	10	.....
Cancer of the stomach, liver	152	156	131	146	150	162	146	159	154	147	117	129	.....
Cancer of the peritoneum, intestines, rectum	34	30	35	24	34	41	25	32	41	20	27	42	.....
Cancer of the female genital organs	30	16	24	36	16	26	32	25	37	37	25	28	.....
Cancer of the breast	22	21	27	17	21	30	15	24	25	27	16	22	.....
Cancer of the skin	10	13	1	13	6	9	6	12	10	15	12	13	.....
Cancer of other organs or of organs not specified	44	44	43	41	44	34	33	49	39	38	33	44	.....
Other tumors (tumors of the female genital organs excepted)	10	15	7	10	7	11	11	10	13	10	14	11	.....
Acute articular rheumatism	40	34	39	46	35	43	28	28	21	32	28	39	.....
Chronic rheumatism and gout	18	11	12	22	15	14	11	8	17	10	10	15	.....
Scurvy	.....	.....	.....	.....	1	1	1	1	3	1	.....	.....	.....
Diabetes	64	77	53	55	53	30	39	43	49	47	70	64	.....
Exophthalmic goitre	6	3	12	6	5	11	5	9	9	10	7	3	.....
Addison's disease	1	1	.....	3	.....	1	1	.....	2	3	1	1	.....
Leuchaemia	7	7	6	5	7	8	11	8	9	11	6	10	.....
Anaemia, chlorosis	18	24	38	31	36	29	24	16	33	21	25	33	.....
Other general diseases	3	3	4	4	5	4	2	3	2	2	2	4	.....
Alcoholism (acute or chronic)	22	17	11	17	12	19	15	16	21	24	15	28	.....
Chronic lead poisoning	.....	.....	.....	.....	1	1	4	2	.....	.....	.....	.....	.....
Other chronic occupation poisonings	.....	.....	1	.....	.....	.....	.....	1	.....	.....	.....	.....	.....
Other chronic poisonings	1	.....	1	1	.....	.....	.....	.....	.....	.....	1	1	.....
II.													
Diseases of the nervous system and of the organs of special sense:													
Encephalitis	2	6	6	7	4	1	2	2	5	4	6	2	.....
Meningitis	48	53	56	49	48	39	45	43	58	41	48	42	.....
Locomotor ataxia	4	5	13	5	3	8	4	7	9	11	3	11	.....
Other diseases of the spinal cord	16	12	20	25	20	17	8	19	17	11	16	28	.....
Cerebral haemorrhage (apoplexy)	282	241	265	265	264	238	199	112	207	245	221	274	1
Softening of the brain	11	10	5	6	5	5	7	5	7	4	7	5	.....
Paralysis without specified cause	36	42	52	26	43	45	31	33	53	40	42	38	.....
General paralysis of the insane	15	5	9	9	14	11	13	12	9	15	12	4	.....
Other forms of mental alienation	15	14	12	8	19	18	8	11	14	19	13	17	.....
Epilepsy	24	10	26	22	18	16	18	15	16	13	17	24	.....
Convulsions (nonpuerperal)	2	2	.....	.....	1	.....	1	2	3	1	2	2	.....
Convulsions of infants	64	73	56	56	52	48	38	32	46	45	33	41	.....
Chorea	.....	4	1	1	.....	3	1	1	.....	.....	4	.....	.....
Neuralgia and neuritis	2	1	2	6	1	4	2	6	4	3	4	3	.....

TABLE NO. 25—Continued. SHOWING CAUSES OF DEATH IN WISCONSIN FROM JAN. 1, 1912, TO DEC. 31, 1913, ARRANGED BY MONTHS.

Name of Disease.	Deaths by months.												
	Jan.	Feb.	Mch.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Un.
Other diseases of the nervous system	18	15	22	22	23	15	17	14	18	14	13	14	.....
Diseases of the eyes and their annexa	.....	1	1	1	1	1	1	.....	2	1	3	1	.....
Diseases of the ears	6	4	5	5	6	.....	5	3	4	2	1	3	.....
III.													
Diseases of the circulatory system:													
Pericarditis	7	3	11	8	7	5	6	3	8	3	7	5	.....
Acute endocarditis	39	43	34	50	42	42	31	40	56	40	43	39	.....
Organic diseases of the heart	391	384	407	362	373	358	330	308	314	341	362	349	.....
Angina pectoris	31	16	27 *	21	24	18	18	12	16	25	15	19	.....
Diseases of the arteries, atheroma, aneurysm, etc.	76	79	54	51	70	65	53	66	45	65	60	68	.....
Embolism and therombosis	21	17	17	14	22	17	15	12	15	18	21	14	.....
Diseases of the veins (varices, haemorrhoids, phlebitis, etc.)	1	4	2	4	3	3	6	4	2	1	5	3	.....
Diseases of the lymphatic system (lymphangitis)	2	.....	2	1	2	3	2	3	2	3	3	3	.....
Haemorrhage; other diseases of the circulatory system	1	6	7	5	6	3	3	3	4	3	3	4	.....
IV.													
Diseases of the respiratory system:													
Diseases of the nasal fossae	1	1	1	1	3	1	.....	2	.....	.....	1	.....	.....
Diseases of the larynx	7	14	6	11	3	3	5	2	3	5	9	7	.....
Diseases of the thyroid body	2	1	4	3	5	3	2	1	1	2	5	2	.....
Acute bronchitis	95	88	85	74	57	35	23	14	25	32	38	69	.....
Chronic bronchitis	49	45	41	44	26	22	17	14	16	25	24	45	.....
Broncho-pneumonia	224	192	199	152	147	102	40	43	47	57	99	132	.....
Pneumonia	403	391	407	322	241	171	82	79	96	155	214	247	.....
Pleurisy	15	12	20	10	18	12	12	12	13	13	7	13	.....
Pulmonary congestion, pulmonary apoplexy	43	50	40	32	35	30	21	26	15	31	33	49	.....
Gangrene of the lung	1	1	1	1	1	1	1	5	1	2	1	2	.....
Asthma	18	17	16	16	8	13	8	11	17	17	10	11	.....
Pulmonary emphysema	.....	5	4	5	2	2	2	4	2	1	1	3	.....
Other diseases of the respiratory system (tuberculosis excepted)	16	10	10	9	10	18	11	8	9	11	11	9	.....

Diseases of the digestive system:													
Diseases of the mouth and annexa	1	3	5	.....	3	1	3	.....	3	1	.....	1	.....
Diseases of the pharynx	11	4	11	6	7	7	4	4	6	3	4	5	.....
Diseases of the oesophagus	2	4	2	.....	1	1	1	3	.....	2	.....	3	.....
Ulcer of the stomach	19	11	21	11	18	19	17	19	17	17	13	8	.....
Other diseases of the stomach (cancer excepted)	74	65	68	82	79	56	56	62	70	53	47	62	.....
Diarrhea and enteritis (under 2 years)	142	122	138	141	130	146	148	409	507	252	115	124	.....
Diarrhea and enteritis (2 years and over)	34	27	25	38	24	37	27	47	67	51	21	32	.....
Ankylostomiasis	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Intestinal parasites	.....	2	.....	.....	.....	.....	.....	1	.....	.....	1	.....	.....
Appendicitis and typhlitis	51	47	52	51	46	59	44	45	51	38	39	46	.....
Hernia, intestinal obstruction	43	44	57	42	49	34	35	41	37	38	49	53	.....
Other diseases of the intestines	8	19	11	18	18	14	21	11	20	19	11	11	.....
Acute yellow atrophy of the liver	1	2	1	.....	3	.....	1	1	1	2	2	2	.....
Hydatid tumor of the liver	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cirrhosis of the liver	36	36	42	58	49	43	38	37	39	42	42	49	.....
Biliary calculi	14	8	6	12	13	7	7	5	10	9	17	13	.....
Other diseases of the liver	25	21	28	31	29	28	25	19	29	19	29	29	.....
Diseases of the spleen	1	2	1	.....	2	.....	1	3	.....	.....	1	3	.....
Simple peritonitis (nonpuerperal)	19	7	16	13	10	15	16	11	13	8	5	5	.....
Other diseases of the digestive system (cancer and tuberculosis excepted)	6	5	9	5	3	6	1	4	2	5	4	3	.....
VI.													
Nonvenereal diseases of the genito-urinary system and annexa:													
Acute nephritis	28	20	21	39	36	23	21	20	27	24	16	21	.....
Bright's disease	230	220	196	197	233	216	167	206	176	181	190	221	.....
Chyluria	.....	.....	.....	.....	1	1	.....	.....	.....	.....	.....	.....	.....
Other diseases of the kidneys and annexa	17	10	9	6	14	8	8	6	7	4	6	13	.....
Calculi of the urinary passages	2	1	1	.....	2	.....	.....	2	2	1	.....	1	.....
Diseases of the bladder	13	14	20	9	17	21	18	14	19	17	16	20	.....
Diseases of the urethra, urinary abscess, etc	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....
Diseases of the prostate	19	29	19	17	17	18	11	9	17	29	30	20	.....
Nonvenereal diseases of the male genital organs	2	.....	2	4	.....	1	1	1	1	1	1	2	.....
Uterine haemorrhage (nonpuerperal)	.....	.....	1	.....	.....	1	.....	.....	1	4	1	1	.....
Uterine tumor (noncancerous)	2	6	5	2	4	4	3	4	6	5	2	3	.....
Other diseases of the uterus	7	5	7	7	11	4	4	5	4	2	4	5	.....
Cysts and other tumors of the ovary	8	2	2	2	5	6	7	2	3	3	3	2	.....
Salpingitis and other diseases of the female genital organs	4	2	5	7	2	1	6	3	.....	4	3	7	.....
Nonpuerperal diseases of the breast (cancer excepted)	.....	.....	.....	2	1	1	1	1	1	1	1	.....	.....

TABLE NO. 25—Continued. SHOWING CAUSES OF DEATH IN WISCONSIN FROM JAN. 1, 1912, TO DEC. 31, 1913, ARRANGED BY MONTHS.

Name of Disease.	Deaths by months.												
	Jan.	Feb.	Mch.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Un.
VII.													
The puerperal state:													
Accidents of pregnancy	6	5	6	7	5	6	5	5	4	1	6	3	.....
Puerperal haemorrhage	2	5	7	9	4	4	11	3	11	7	2	7	.....
Other accidents of labor	11	7	8	2	11	8	5	4	2	6	6	5	.....
Puerperal septicaemia	15	21	15	18	24	18	6	13	6	14	12	11	.....
Puerperal albuminuria and convulsions	6	8	5	6	8	17	10	9	10	11	3	8	.....
Puerperal phlegmasia alba dolens, embolus, sudden death	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1	.....	.....
Following childbirth (not otherwise defined)	2	.....	.....	1	2	.....	1	1	1	.....	2	.....	.....
Puerperal diseases of the breast	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
VIII.													
Diseases of the skin and of the cellular tissue:													
Gangrene	10	9	19	16	12	14	15	15	5	9	10	8	.....
Furuncle	1	1	4	.....	1	2	2	2	1	4	2	1	.....
Acute abscess	3	9	5	3	6	4	2	2	4	1	1	1	.....
Other diseases of the skin and annexa	6	5	7	3	6	2	3	4	8	5	7	4	.....
IX.													
Diseases of the bones and of the organs of locomotion:													
Diseases of the bones (tuberculosis excepted)	7	10	8	7	9	9	15	5	7	8	6	9	.....
Diseases of the joints (tuberculosis and rheumatism excepted)	.....	.....	.....	1	2	.....	.....	1	.....	1	1	1	.....
Amputations	.....	1	.....	2	.....	1	.....	2	.....	.....	.....	1	.....
Other diseases of the organs of locomotion	1	.....	1	1	.....	1	.....	.....	.....	.....	1	2	.....
X.													
Malformations:													
Congenital malformations	53	38	57	46	48	34	35	46	47	49	51	44	.....

XI.													
Early infancy:													
Congenital debility, icterus and sclerema	268	240	305	322	327	280	244	287	318	272	216	239	.....
Other causes peculiar to early infancy	76	95	104	93	85	75	64	63	78	79	61	77	.....
Lack of care	.....	.....	3	1	1	1	.....	.....	.....	.....	1	1	.....
XII.													
Old age:													
Senility	308	248	264	244	264	210	209	153	200	256	202	207	.....
XIII.													
External causes:													
Suicide by poison	10	11	14	22	14	11	22	9	16	15	10	11	.....
Suicide by asphyxia	1	.....	1	.....	3	.....	2	1	5	.....	2	.....	.....
Suicide by hanging or strangulation	7	11	10	13	19	14	14	11	9	10	8	12	.....
Suicide by drowning	1	.....	2	6	3	6	4	2	6	8	1	3	.....
Suicide by firearms	14	20	9	14	25	8	19	17	20	23	11	17	.....
Suicide by cutting or piercing instruments	2	3	5	5	7	3	5	3	3	4	3	1	.....
Suicide by jumping from high places	.....	.....	.....	.....	1	1	.....	1	.....	.....	.....	.....	.....
Suicide by crushing	.....	.....	.....	1	1	.....	.....	.....	1	.....	2	.....	.....
Other suicides	.....	.....	2	3	2	.....	3	1	.....	.....	.....	3	.....
Poisoning by food	3	1	4	3	6	4	8	8	8	4	3	5	.....
Other acute poisonings	4	10	8	3	8	9	12	8	8	7	6	4	.....
Conflagration	9	3	3	1	3	3	2	2	.....	16	3	.....	.....
Burns (conflagration excepted)	22	20	26	20	10	25	12	22	14	19	26	20	.....
Absorption of deleterious gases (168)	15	6	7	4	6	2	4	7	6	6	2	3	.....
Accidental drowning	5	8	16	41	67	128	92	84	45	24	25	37	2
Traumatism by firearms	4	2	10	7	12	8	6	8	19	21	37	12	.....
Traumatism by cutting or piercing instruments	.....	2	3	1	1	1	.....	1	1	1	.....	3	.....
Traumatism by fall	25	27	21	14	21	23	31	39	30	22	23	38	.....
Traumatism in mines and quarries	6	2	2	1	1	6	3	2	.....	3	1	2	.....
Traumatism by machines	2	9	6	5	8	12	3	9	8	8	8	9	.....
Traumatism by other crushing	60	52	69	47	67	79	72	100	92	92	77	69	.....
Injuries by animals	7	1	2	2	4	4	5	8	9	11	6	2	.....
Starvation	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1	.....	.....
Excessive cold	18	9	5	.....	.....	.....	.....	.....	.....	1	.....	9	.....
Effects of heat	.....	.....	.....	.....	.....	35	26	8	3	.....	.....	.....	.....
Lightning	.....	.....	1	1	4	6	6	4	2	2	.....	.....	.....
Electricity (lightning excepted)	.....	.....	.....	2	4	8	11	6	8	4	2	1	.....
Fractures (cause not specified)	37	30	35	27	21	29	29	32	27	26	23	31	.....
Other external violence	18	11	20	18	20	14	27	20	13	15	17	17	.....
Homicide by firearms	5	3	2	4	2	1	2	3	9	5	3	4	.....

TABLE NO. 25—Concluded. SHOWING CAUSES OF DEATH IN WISCONSIN FROM JAN. 1, 1912, TO DEC. 31, 1913, ARRANGED BY MONTHS.

Name of Disease.	Deaths by months.												
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Un.
Homicide by cutting or piercing instruments	.....	5	.....	.....	1	5	4	.....	2	3	1	.....	.....
Homicide by other means	4	1	2	.....	4	.....	3	4	4	5	1	.....	.....
XIV.													
Ill-defined diseases:													
Ill-defined organic disease	4	4	1	2	.....	1	2	3	.....	2	3	2	.....
Sudden death	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Not specified or ill-defined	40	34	28	30	24	28	20	14	17	29	26	27	.....
Total	5,264	4,892	5,207	4,891	4,967	4,522	3,879	4,109	4,438	4,243	3,949	4,494	2

TABLE NO. 26.—SHOWING CAUSES OF DEATH IN WISCONSIN FROM JAN. 1, 1912, TO DEC. 31, 1913, ARRANGED ACCORDING TO AGE GROUPING.

Name of Disease.	Age Grouping.														
	Under 2 mos.	Under 1 yr.	1-4	5-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	Age unknown.
I															
General diseases:															
Typhoid fever	.....	6	15	32	99	163	92	58	51	23	4	1	.....	1	2
Typhus fever	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Relapsing fever	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Malaria	.....	.....	.....	.....	.....	1	1	2	1	1	.....	.....	.....	.....	.....
Smallpox	1	2	.....	1	.....	1	.....	1	1	.....	.....	.....	.....	.....	.....
Measles	12	101	149	34	24	6	3	4	.....	2	1	.....	.....	.....	1
Scarlet fever	3	23	194	144	79	23	10	2	.....	.....	.....	.....	.....	.....	1
Whooping cough	60	203	152	22	5	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Diphtheria and croup	6	31	245	187	67	14	12	7	2	1	.....	.....	.....	.....	.....
Influenza	17	26	22	7	12	17	18	32	54	89	162	137	17	.....	1
Miliary fever	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Asiatic cholera	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cholera nostras	.....	1	3	1	1	2	1	1	4	5	8	2	1	.....	.....
Dysentery	1	2	10	.....	.....	2	2	.....	5	16	20	10	1	.....	.....
Plague	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Yellow fever	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Leprosy	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Erysipelas	10	19	3	.....	5	3	10	15	15	21	17	19	.....	.....	.....
Other epidemic diseases	2	1	4	.....	1	.....	3	.....	.....	1	1	.....	.....	.....	.....
Purulent infection and septicaemia	9	6	4	7	15	24	25	20	12	17	13	5	.....	.....	1
Glanders	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Anthrax	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....
Rabies	.....	.....	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tetanus	12	1	5	7	5	4	4	7	3	4	2	.....	.....	.....	.....
Mycoses	.....	.....	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pellagra	.....	.....	.....	.....	.....	.....	1	1	3	2	.....	.....	.....	.....	.....
Beriberi	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tuberculosis of the lungs	4	26	28	20	380	1,162	845	591	418	286	117	35	1	.....	4
Acute miliary tuberculosis	2	1	4	5	13	24	19	7	10	4	1	.....	.....	.....	1
Tuberculous meningitis	4	41	76	31	39	30	14	9	4	4	.....	.....	.....	.....	1
Abdominal tuberculosis	.....	9	7	7	23	50	38	24	30	19	9	1	.....	.....	.....
Pott's disease	1	.....	2	2	7	14	12	6	5	3	1	.....	.....	.....	.....

TABLE NO. 26—Continued. SHOWING CAUSES OF DEATH IN WISCONSIN FROM JAN. 1, 1912, TO DEC. 31, 1913, ARRANGED ACCORDING TO AGE GROUPING.

Name of Disease.	Age Grouping.														
	Under 2 mos.	Under 1 year.	1-4	5-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	Age Unknown.
White swellings	.....	.....	.....	.....	3	4	1	1	.....	4	2	.....	.....	.....	.....
Tuberculosis of other organs	.....	5	2	2	5	14	3	3	6	5	4	1	.....	.....	.....
Disseminated tuberculosis	.....	1	4	4	15	30	15	11	6	6	2	.....	.....	.....	.....
Rickets	5	22	17	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....
Syphilis	37	22	4	2	2	11	15	15	10	3	2	.....	.....	.....	.....
Gonococcus infection	2	.....	.....	.....	1	2	1	.....	.....	.....	.....	.....	.....	.....	.....
Cancer of the buccal cavity	.....	.....	.....	.....	.....	.....	1	9	13	24	24	17	1	.....	.....
Cancer of the stomach, liver	.....	.....	.....	.....	1	8	52	188	411	524	436	122	3	.....	4
Cancer of the peritoneum, intestines, rectum	.....	.....	.....	.....	.....	4	14	42	87	116	89	31	2	.....	.....
Cancer of the female genital organs	.....	.....	.....	.....	.....	10	27	74	90	71	49	10	.....	.....	1
Cancer of the breast	.....	.....	.....	.....	.....	1	29	56	64	55	42	18	.....	.....	2
Cancer of the skin	.....	.....	.....	.....	.....	.....	3	2	14	27	33	38	2	.....	1
Cancer of other organs or of organs not specified	.....	.....	2	1	2	4	12	58	105	145	101	46	8	.....	2
Other tumors (tumors of the female genital organs excepted)	.....	.....	3	5	3	9	8	17	28	28	18	10	.....	.....	.....
Acute articular rheumatism	.....	1	12	27	93	45	38	36	46	44	49	16	5	.....	1
Chronic rheumatism and gout	.....	.....	1	.....	3	6	5	6	20	51	49	17	3	.....	2
Scurvy	1	3	.....	.....	.....	.....	.....	.....	.....	1	2	1	.....	.....	.....
Diabetes	.....	2	8	23	80	54	21	57	103	146	112	34	3	.....	1
Exophthalmic goitre	.....	.....	.....	.....	3	7	14	19	21	14	1	.....	.....	.....	1
Addison's disease	.....	.....	.....	.....	3	.....	5	2	1	1	1	1	.....	.....	.....
Leuchaemia	.....	1	6	5	9	13	15	6	18	12	9	.....	.....	.....	1
Anaemia, chlorosis	1	2	6	6	11	16	34	50	82	65	42	10	2	.....	1
Other general diseases	6	2	5	3	4	4	2	3	2	4	2	1	.....	.....	.....
Alcoholism (acute or chronic)	.....	.....	.....	.....	1	20	52	59	47	28	5	.....	.....	.....	5
Chronic lead poisoning	.....	.....	.....	.....	.....	1	2	1	2	1	1	.....	.....	.....	.....
Other chronic occupation poisonings	.....	.....	.....	.....	.....	1	.....	.....	.....	1	.....	.....	.....	.....	.....
Other chronic poisonings	.....	.....	.....	.....	.....	.....	.....	.....	2	2	1	.....	.....	.....	.....
II															
Diseases of the nervous system and of the organs of special sense:															
Encephalitis	3	7	5	1	8	6	1		4	3	3	.....	.....	.....	.....

Meningitis	44	136	136	62	68	47	25	11	17	10	12	2	.....	.....	.....
Locomotor ataxia	.....	.....	.....	.....	.....	2	14	16	21	21	8	1	.....	.....	.....
Other diseases of the spinal cord	3	11	12	11	8	12	10	10	34	33	49	13	1	.....	2
Cerebral haemorrhage, apoplexy	32	3	4	4	10	32	67	201	399	668	876	529	82	2	5
Softening of the brain	.....	.....	.....	1	.....	2	3	3	6	16	25	20	1	.....	.....
Paralysis without specified cause	.....	.....	.....	.....	5	3	11	14	46	112	156	120	13	.....	1
General paralysis of the insane	.....	.....	.....	.....	3	6	21	39	23	14	15	5	2	.....	.....
Other forms of mental alienation	.....	.....	.....	.....	1	15	29	25	32	32	24	6	1	.....	3
Epilepsy	5	1	9	8	29	40	30	25	30	23	12	4	1	.....	2
Convulsions (nonpuerperal)	.....	1	1	2	2	5	1	.....	2	1	1	.....	.....	.....	.....
Convulsions of infants	370	147	65	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chorea	1	.....	2	.....	2	2	.....	1	2	2	1	2	.....	.....	.....
Neuralgia and neuritis	.....	.....	.....	.....	4	1	3	3	10	10	6	1	.....	.....	.....
Other diseases of the nervous system	6	7	5	10	23	28	21	26	28	19	20	11	.....	.....	1
Diseases of the eyes and their annexa	.....	.....	3	.....	1	.....	1	3	1	.....	4	.....	.....	.....	.....
Diseases of the ears	1	10	3	5	7	3	3	1	5	.....	5	.....	1	.....	.....
III.															
Diseases of the circulatory system:															
Pericarditis	.....	.....	1	1	4	7	7	11	13	9	13	6	1	.....	.....
Acute endocarditis	.....	.....	.....	42	38	49	36	73	97	105	41	15	2	.....	1
Organic diseases of the heart	23	10	14	21	71	114	161	270	582	928	1352	666	56	.....	11
Angina pectoris	.....	.....	1	1	2	4	11	20	39	71	67	24	1	.....	1
Diseases of the arteries, atheroma, aneurysm, etc	1	1	.....	.....	3	5	4	14	67	136	266	211	42	.....	2
Embolism and thrombosis	2	.....	1	2	.....	12	17	20	31	37	52	26	2	1	.....
Diseases of the veins (varices, haemorrhoids, phlebitis, etc.)	.....	.....	.....	.....	1	1	3	4	9	8	9	3	.....	.....	.....
Diseases of the lymphatic system (lymphangitis, etc.)	5	3	1	3	1	3	2	3	2	.....	1	2	.....	.....	.....
Haemorrhage; other diseases of the circulatory system	12	2	3	1	3	7	3	4	5	2	5	1	.....	.....	.....
IV.															
Diseases of the respiratory system:															
Diseases of the nasal fossae	1	1	1	1	2	2	.....	.....	1	1	.....	1	.....	.....	.....
Diseases of the larynx	5	13	33	8	3	2	1	.....	1	5	4	.....	.....	.....	.....
Diseases of the thyroid body	2	.....	1	1	2	4	5	1	7	4	2	2	.....	.....	.....
Acute bronchitis	115	161	79	7	2	6	8	3	13	35	83	104	18	.....	1
Chronic bronchitis	2	5	6	1	2	1	1	3	20	60	125	119	22	1	.....
Broncho-pneumonia	206	439	259	26	13	14	31	24	32	81	161	118	25	.....	5
Pneumonia	131	291	184	65	91	146	185	226	298	379	472	290	42	.....	8
Pleurisy	2	3	14	6	9	17	14	21	14	20	24	11	2	.....	.....
Pulmonary congestion, pulmonary apoplexy	42	12	11	.....	3	9	11	21	35	61	106	83	11	.....	.....

TABLE NO. 26—Continued. SHOWING CAUSES OF DEATH IN WISCONSIN FROM JAN. 1, 1912, TO DEC. 31, 1913, ARRANGED ACCORDING TO AGE GROUPING.

Name of Disease.	Age Grouping.													
	Under 2 mos.	Under 1 year.	1-4	5-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	Age unknown.
Gangrene of the lung	.....	.....	1	.....	1	.....	1	3	4	4	2	1	1	.....	.....
Asthma	2	.....	1	2	1	3	6	11	21	41	52	19	2	.....	1
Pulmonary emphysema	.....	.....	1	1	.....	.....	.....	3	6	11	6	3	.....	.....	.....
Other diseases of the respiratory system (tuberculosis excepted)	2	5	6	2	5	19	16	14	16	18	20	8	1	.....	.....
V.															
Diseases of the digestive system:															
Diseases of the mouth and annexa	5	4	6	1	.....	.....	1	1	1	.....	2	.....	.....	.....	.....
Diseases of the pharynx	1	6	17	11	8	8	2	4	7	5	2	1	.....	.....	.....
Diseases of the oesophagus	.....	2	2	.....	1	.....	1	1	2	2	6	2	.....	.....	.....
Ulcer of the stomach	2	.....	1	1	7	18	17	22	49	29	40	4	.....	.....	.....
Other diseases of the stomach (cancer excepted)	157	167	60	7	7	15	16	27	44	86	103	80	5	.....	.....
Diarrhea and enteritis (under 2 yrs.)	601	1,311	461	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Diarrhea and enteritis (2 yrs. and over)	.....	.....	77	41	12	14	15	24	43	46	89	56	12	.....	1
Ankylostomiasis	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Intestinal parasites	.....	.....	1	1	1	.....	.....	.....	.....	.....	.....	1	.....	.....	.....
Appendicitis and typhlitis	2	1	22	75	152	107	74	51	38	24	17	5	.....	.....	1
Hernia, intestinal obstruction	26	41	31	16	16	31	35	39	54	81	96	51	5	.....	.....
Other diseases of the intestines	13	6	4	7	6	10	24	24	20	20	25	20	1	.....	1
Acute yellow atrophy of the liver	.....	.....	.....	.....	1	1	2	1	4	4	3	.....	.....	.....	.....
Hydatid tumor of the liver	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cirrhosis of the liver	1	1	.....	2	.....	9	35	102	113	125	97	25	.....	.....	1
Biliary calculi	.....	.....	.....	.....	.....	5	12	16	24	24	33	7	.....	.....	.....
Other diseases of the liver	14	4	4	4	3	16	27	43	55	66	48	25	2	.....	1
Diseases of the spleen	.....	.....	1	.....	1	1	.....	3	2	2	3	.....	1	.....	.....
Simple peritonitis (non puerperal)	8	5	5	10	18	25	18	12	12	12	8	4	.....	.....	1
Other diseases of the digestive system (cancer and tuberculosis excepted)	1	.....	1	1	4	7	7	5	10	8	3	5	1	.....	.....

VI.															
Nonvenereal diseases of the genito-urinary system and annexa:															
Acute nephritis	12	17	33	16	15	20	30	31	32	38	36	13	2	1	.....
Bright's disease	10	11	13	16	47	86	143	223	367	563	596	320	31	.....	7
Chyluria	.....	.....	.....	.....	.....	.....	.....	.....	1	1	.....	.....	.....	.....	.....
Other diseases of the kidneys and annexa	10	.....	6	.....	1	3	9	10	15	16	24	13	1	.....	.....
Calculi of the urinary passages	.....	.....	.....	.....	.....	1	1	1	1	3	3	2	.....	.....	.....
Diseases of the bladder	4	2	1	2	1	.....	2	4	8	26	76	62	9	.....	1
Diseases of the urethra, urinary abscess, etc	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....
Diseases of the prostate	.....	.....	.....	.....	1	1	2	3	6	46	93	71	12	.....	.....
Nonvenereal diseases of the male genital organs	6	1	.....	1	1	1	2	2	.....	.....	.....	2	.....	.....	.....
Uterine haemorrhage (non puerperal)	1	.....	.....	.....	2	1	3	1	.....	.....	1	.....	.....	.....	.....
Uterine tumor (non cancerous)	.....	.....	.....	.....	.....	6	8	16	8	3	5	.....	.....	.....	.....
Other diseases of the uterus	.....	.....	1	.....	8	15	8	16	9	2	4	1	1	.....	.....
Cysts and other tumors of the ovary	.....	.....	.....	.....	3	5	5	9	8	8	4	3	.....	.....	.....
Salpingitis and other diseases of the female genital organs	.....	.....	.....	.....	5	13	16	7	1	2	.....	.....	.....	.....	.....
Nonpuerperal diseases of the breast (cancer excepted)	.....	.....	.....	.....	1	2	2	.....	2	1	1	.....	.....	.....	.....
VII.															
The puerperal state:															
Accidents of pregnancy	.....	.....	.....	.....	3	17	33	6	.....	.....	.....	.....	.....	.....	.....
Puerperal haemorrhage	.....	.....	.....	.....	1	29	34	8	.....	.....	.....	.....	.....	.....	.....
Other accidents of labor	.....	.....	.....	.....	3	27	35	9	.....	.....	.....	.....	.....	.....	1
Puerperal septicaemia	.....	.....	.....	.....	16	80	67	8	1	.....	.....	.....	.....	.....	1
Puerperal albuminuria and convulsions	.....	.....	.....	.....	7	39	41	14	.....	.....	.....	.....	.....	.....	.....
Puerperal phlegmasia, alba dolens, embolus, sudden death	.....	.....	.....	.....	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....
Following childbirth (not otherwise defined)	.....	.....	.....	.....	.....	4	4	1	1	.....	.....	.....	.....	.....	.....
Puerperal diseases of the breast	.....	.....	.....	.....	.....										
VIII.															
Diseases of the skin and of the cellular tissue:															
Gangrene	.....	.....	.....	.....	1	2	3	4	7	23	42	53	7	.....	.....
Furuncle	.....	4	1	.....	.....	4	2	2	2	1	1	4	.....	.....	.....
Acute abscess	11	3	2	.....	2	2	2	6	3	4	4	2	.....	.....	.....
Other diseases of the skin and annexa	18	10	6	1	1	1	2	1	3	3	7	7	.....	.....	.....

TABLE NO. 26—Concluded. SHOWING CAUSES OF DEATH IN WISCONSIN FROM JAN. 1, 1912, TO DEC. 31, 1913, ARRANGED ACCORDING TO AGE GROUPING.

Name of Disease.	Age Grouping.														
	Under 2 mos.	Under 1 yr.	1-4	5-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	Age unknown.
IX.															
Diseases of the bones and of the organs of locomotion:															
Diseases of the bones (tuberculosis excepted)	2	5	7	13	11	13	8	9	15	8	9				
Diseases of the joints (tuberculosis and rheumatism excepted)					2	1			2	2					
Amputations				1		1	2	1	2						
Other diseases of the organs of locomotion					1		1	1		2	2				
X.															
Malformations:															
Congenital malformations	450	80	15	2	1										
XI.															
Early infancy:															
Congenital debility, icterus and sclerema	2,869	406	43												
Other causes peculiar to early infancy	894	47	9												
Lack of care	1	7													
XII.															
Old age:															
Senility									12	94	683	1,483	480	10	3
XIII.															
External causes:															
Suicide by poison					12	42	29	23	34	17	6	1	1		
Suicide by asphyxia					6	4	2	3	3	3					
Suicide by hanging or strangulation					6	16	16	25	31	19	12	9	4		
Suicide by drowning					3	7	7	7	10	4	3		1		
Suicide by firearms					7	46	43	27	34	22	11	4			3
Suicide by cutting or piercing instruments					1	3	8	11	11	3	5				2
Suicide by jumping from high places							2			1					
Suicide by crushing						2	1				1				1

Other suicides	.....	.....	.....	.....	.....	.....	3	.....	3	4	2	2	.....	.....	.....
Poisoning by food	3	8	11	5	3	2	8	5	6	3	2	1	.....	.....	.....
Other acute poisonings	1	5	26	4	4	8	12	8	4	8	4	2	.....	.....	1
Conflagration	.....	4	11	2	2	6	5	3	6	2	3	1	.....	.....	.....
Burns (conflagration excepted)	2	9	104	14	12	16	18	20	13	10	12	6	.....	.....	.....
Absorption of deleterious gases (conflagration excepted)	5	2	1	.....	5	9	7	5	9	17	5	1	1	.....	1
Accidental drowning	1	3	44	57	141	139	63	49	34	18	11	2	.....	.....	12
Traumatism by firearms	.....	.....	5	11	46	33	11	15	17	3	2	.....	.....	.....	3
Traumatism by cutting or piercing instruments	.....	1	.....	.....	2	4	4	2	1	.....	.....	.....	.....	.....	.....
Traumatism by fall	1	2	13	11	14	42	31	28	42	51	46	25	6	.....	2
Traumatism in mines and quarries	.....	.....	.....	.....	2	14	9	3	1	.....	.....	.....	.....	.....	.....
Traumatism by machines	.....	.....	.....	1	12	25	16	16	11	5	1	.....	.....	.....	.....
Traumatism by other crushing	.....	2	24	41	67	205	158	140	101	72	27	10	2	.....	27
Injuries by animals	.....	.....	9	3	9	3	3	7	7	11	5	4	.....	.....	.....
Starvation	.....	.....	.....	.....	.....	.....	1	.....	1	.....	.....	.....	.....	.....	.....
Excessive cold	1	1	.....	.....	.....	3	2	8	7	8	6	2	1	.....	3
Effects of heat	4	3	.....	1	2	6	9	13	12	9	8	4	.....	.....	1
Lightning	.....	.....	.....	1	7	7	3	2	2	3	1	.....	.....	.....	.....
Electricity (lightning excepted)	.....	.....	3	.....	8	15	7	6	6	1	.....	.....	.....	.....	.....
Fractures (cause not specified)	.....	1	4	4	15	19	28	31	27	36	67	83	26	3	3
Other external violence	3	11	23	7	32	20	15	20	28	24	15	7	.....	.....	5
Homicide by firearms	.....	.....	.....	.....	3	9	13	6	4	4	3	.....	.....	.....	1
Homicide by cutting or piercing instruments	.....	2	2	2	1	4	5	1	1	2	.....	.....	.....	.....	1
Homicide by other means	6	.....	.....	.....	.....	5	4	4	5	2	2	.....	.....	.....	.....
XVII.															
Ill-defined diseases:															
Ill-defined organic disease	.....	1	.....	.....	.....	.....	4	2	2	2	8	5	.....	.....	.....
Sudden death	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Not specified or ill-defined	6	4	8	9	13	23	28	31	68	55	38	13	5	.....	16
Total	6,367	4,029	2,974	1,286	2,250	3,814	3,570	3,925	5,295	6,655	7,984	5,514	996	19	180

TABLE NO. 27. SHOWING THE TOTAL DEATHS IN EACH COUNTY FROM JAN. 1, 1912, TO DEC. 31, 1913, ARRANGED ACCORDING TO THE CAUSES OF DEATH.

Counties.	Typhoid fever.			Typhus fever.			Relapsing fever.			Malaria.			Smallpox.			Measles.			Scarlet fever.			Whooping cough.			Diphtheria and Croup.			Influenza.		
	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.
Adams	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	1	....	1	1	1	1	....	1	1	5	6	11
Ashland	8	8	16	....	....	....	....	....	....	....	....	....	....	....	....	....	3	3	....	....	....	3	5	8	2	2	4	1	1	2
Barron	4	1	5	....	....	....	....	....	....	....	....	....	....	....	....	....	7	7	2	2	4	2	3	5	....	2	2	1	7	8
Bayfield	3	3	6	....	....	....	....	....	....	1	....	1	....	....	....	1	2	3	....	....	....	1	1	2	....	....	....	....	....	....
Brown	8	5	13	....	....	....	....	....	....	....	....	....	....	1	1	2	....	2	5	9	14	5	14	19	9	3	12	3	2	5
Buffalo	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	1	2	3	....	2	2	....	....	....	2	....	2	1	4	5
Burnett	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	1	1	....	1	1	....	....	....	....	....	....
Calumet	....	2	2	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	3	1	4	....	....	....	....	....	....
Chippewa	3	4	7	....	....	....	....	....	....	....	....	....	....	....	....	1	3	4	1	5	6	2	4	6	3	1	4	8	12	20
Clark	1	4	5	....	....	....	....	....	....	....	....	....	....	2	2	....	1	1	....	....	....	....	4	4	6	1	7	3	3	6
Columbia	2	2	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	2	3	1	5	6	1	1	2	17	11	28
Crawford	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	3	....	3	....	1	1	3	6	9
Dane	4	7	11	....	....	....	....	....	....	....	....	....	1	....	1	....	4	4	3	4	7	4	6	10	2	6	8	14	13	27
Dodge	2	2	4	....	....	....	....	....	....	....	....	....	....	....	....	4	3	7	15	2	17	3	3	6	3	3	6	5	11	16
Door	1	1	2	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	6	....	6	1	5	6	2	....	2	2	1	3
Douglas	8	7	15	....	....	....	....	....	....	....	....	....	....	....	....	1	16	17	7	2	9	2	7	9	8	....	8	3	3	6
Dunn	....	2	2	....	....	....	....	....	....	....	....	....	....	....	....	....	3	3	3	1	4	3	4	7	....	....	....	1	1	2
Eau Claire	2	6	8	....	....	....	....	....	....	....	....	....	....	....	....	1	8	9	3	2	5	1	3	4	1	....	1	3	2	5
Florence	....	2	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....
Fond du Lac	3	9	12	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	1	1	2	3	6	9	5	5	10	11	11	22
Forest	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	....	....	....
Grant	3	4	7	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	8	....	8	3	1	4	2	1	3	2	16	18
Green	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	2	3	2	....	2	2	....	2	1	3	4
Green Lake	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	4	4	....	....	....	1	1	2	....	3	3	2	2	4
Iowa	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	1	....	1	....	3	3	5	3	8
Iron	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4	4	8	....	....	....	1	1	2	....	....	....	....	....	....
Jackson	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2	2	....	2	....	1	1	3	6	9
Jefferson	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	11	7	18	3	3	6	2	2	4	3	6	9
Juneau	1	1	2	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	1	1	2	3	2	5	5	4	9	4	2	6
Kenosha	8	11	19	....	....	....	....	....	....	....	....	....	....	....	....	3	12	15	55	6	61	2	2	4	5	6	11	6	7	13
Kewaunee	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	3	2	5	....	2	2	1	5	6	....	4	4
La Crosse	4	4	8	....	....	....	....	....	....	....	....	....	....	1	1	....	2	2	....	1	1	1	2	3	7	4	11	2	5	7

La Fayette	3	....	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	1	....	1	....	2	2	3	1	4	4	2	6
Langlade	1	2	3	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	1	....	1	2	1	3	2	3	5	....	....	....
Lincoln	3	1	4	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	2	1	3	2	1	3	....	3	3
Manitowoc	6	6	12	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	2	2	7	9	3	....	3	2	3	5	4	7	11
Marathon	5	7	12	....	....	....	....	....	....	....	....	....	....	1	....	1	8	....	8	8	6	14	10	17	27	10	4	14	5	6	11
Marinette	6	3	9	....	....	....	....	....	....	....	....	....	....	....	....	....	2	1	3	3	1	4	5	2	7	....	1	1	1	....	1
Marquette	1	1	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	3	....	....	....	2	2	4	2	2	4	4	3	7
Milwaukee	128	57	185	....	....	....	....	....	....	1	1	2	....	....	....	....	71	33	104	68	81	149	97	17	114	123	159	282	32	45	77
Monroe	2	1	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	3	1	1	2	2	....	2	3	1	4	2	12	14
Oconto	1	1	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	1	3	....	....	....	....	2	2	1	5	6
Oneida	1	1	2	....	....	....	....	....	....	....	....	....	....	....	....	....	4	....	4	....	....	....	....	....	....	1	....	1	....	2	2
Outagamie	4	4	8	....	....	....	....	....	....	....	....	....	....	....	....	....	1	3	4	2	7	9	2	5	7	1	2	3	4	3	7
Ozaukee	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	5	5	10	2	2	4	3	1	4	....	....	....	....	1	2
Pepin	1	3	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	3	....	....	....	1	....	1	....	2	2	3	2	5
Pierce	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	2	....	....	....	1	....	1	3	....	3	1	....	1
Polk	1	1	2	....	....	....	....	....	....	1	1	....	....	....	....	....	....	5	5	2	3	5	....	....	....	2	1	3	3	3	6
Portage	3	3	6	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	3	2	....	2	2	1	3	2	6	8	4	7	11
Price	3	1	4	....	....	....	....	....	....	....	....	....	....	....	....	....	4	1	5	2	1	3	1	1	2	....	....	....	2	....	2
Racine	20	9	29	....	....	....	....	....	....	....	....	....	....	....	....	....	....	7	7	3	2	5	10	4	14	14	14	28	10	8	18
Richland	1	1	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	4	1	2	3	....	....	....	3	1	4
Rock	4	4	8	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	3	2	2	4	4	3	7	3	2	5	7	18	25
Rusk	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	2	4	6	2	4	6	1	4	5	2	6	8
St. Croix	2	2	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	9	9	....	....	....	1	....	1	1	....	1	2	2	4
Sauk	3	....	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2	....	....	....	1	....	1	11	9	20
Sawyer	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Shawano	3	....	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	2	1	3	....	4	4	2	....	2	1	3	4
Sheboygan	6	7	13	....	....	....	....	....	....	....	....	....	....	....	....	....	3	9	12	4	7	11	....	16	16	4	11	15	4	7	11
Taylor	2	2	4	....	....	....	....	....	....	....	....	....	....	....	....	....	1	3	4	....	....	....	5	3	8	1	2	3	....	1	1
Trempealeau	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	1	....	1	5	1	6	....	....	....
Vernon	1	1	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	1	1	3	1	4	4	....	4	8	3	11
Vilas	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	3	....	1	1	1	1	2	....	....	....
Walworth	1	2	3	....	....	....	....	....	....	....	....	....	....	....	....	....	3	1	4	1	....	1	1	6	7	....	2	2	6	9	15
Washburn	2	3	5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	3	....	....	....	....	4	4	....	2	2	....	2	2
Washington	4	3	7	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	3	1	1	2	5	3	8	1	....	1	1	2	3
Waukesha	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	2	6	8	2	3	5	2	2	4	1	1	2	5	8	13
Waupaca	7	....	7	....	....	....	....	....	....	1	1	....	....	....	....	....	1	....	1	8	1	9	....	1	1	2	1	3	4	9	13
Waushara	1	2	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	7	7	12	8	20	4	1	5	6	2	8	5	6	11
Winnebago	8	9	17	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	3	5	....	5	3	16	19	7	4	11	5	10	15
Wood	5	10	15	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	8	3	11	1	2	3	1	1	2	1	3	4
Total	310	237	547	....	....	....	....	....	....	3	3	6	3	4	7	127	210	337	283	197	479	232	211	443	279	293	572	255	356	611

TABLE NO. 27.—Continued. SHOWING THE TOTAL DEATHS IN EACH COUNTY FROM JAN. 1, 1912, TO DEC. 31, 1913, ARRANGED ACCORDING TO THE CAUSES OF DEATH.

Counties.	Miliary fever.			Asiatic cholera.			Cholera nostras.			Dysentery.			Plague.			Yellow fever.			Leprosy.			Erysipelas.			Other epidemic diseases.			Purulent infection and septicemia		
	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.
Adams																														
Ashland																							1	1				3		3
Barron																						1		1						
Bayfield										1		1																2		2
Brown								1	1	2		2										2	1	3				4	8	12
Buffalo																						1		1					1	1
Burnett										1		1																1		1
Calumet																													2	2
Chippewa								1	1	1	1	2										2	2	4				2		2
Clark																						1	2	3						
Columbia											2	2										2	1	3				2		2
Crawford										1		1											1	1				1		1
Dane								1	1	1	1	2										6	7	13				2	4	6
Dodge							1		1	3	2	5										1		1				3	1	4
Door																												1		1
Douglas								1	1														2	2				4	3	7
Dunn																						1		1						
Eau Claire								2	2	1		1										1		1				2	1	3
Florence																												1		1
Fond du Lac																									1		1	2	1	3
Forest																														
Grant																						1		1				1		1
Green																												1		1
Green Lake								1	1													1		1						
Iowa							1	1	2	1		1										2		2				1		1
Iron																												1		1
Jackson											1	1										3		3				2	1	3
Jefferson											1	1										3	3	6				1		1
Juneau																							1	1						
Kenosha							1		1		1	1										1	1	2				1	2	3
Kewaunee																														

La Crosse	....	....	....	....	....	....	1	....	1	1	....	1	....	....	....	....	....	....	....	....	....	....	2	2	....	....	....	1	3	4
La Fayette	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	2	....	....	....	1	....	1
Langlade	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Lincoln	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4	....	4
Manitowoc	....	....	....	....	....	....	....	1	1	2	2	4	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	3	....	3
Marathon	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	1	3	4	....	1	1	1	4	5
Marinette	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	1	1	2	1	....	1	2	2	4
Marquette	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....
Milwaukee	....	....	....	....	....	....	....	3	3	13	2	15	....	....	....	....	....	....	....	....	....	16	17	33	2	1	3	19	14	33
Monroe	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	1	1	1	....	1	1	....	1
Oconto	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....
Oneida	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....
Outagamie	....	....	....	....	....	....	1	....	1	....	2	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	4
Ozaukee	....	....	....	....	....	....	....	1	1	....	1	1	....	....	....	....	....	....	....	....	....	2	....	2	....	....	....	....	....	....
Pepin	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	....	....	....	....	1	1
Pierce	....	....	....	....	....	....	....	3	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Polk	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	1	1
Portage	....	....	....	....	....	....	....	1	1	....	1	1	....	....	....	....	....	....	....	....	....	1	1	2	....	....	....	....	1	1
Price	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....
Racine	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	4	4	8	....	....	....	2	3	5
Richland	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....
Rock	....	....	....	....	....	....	....	1	1	3	2	5	....	....	....	....	....	....	....	....	....	2	3	5	....	....	....	1	1	2
Rusk	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....
St. Croix	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	1	1
Sauk	....	....	....	....	....	....	1	....	1	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2
Sawyer	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Shawano	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	1	1	2	....	....	....	1	1	2
Sheboygan	....	....	....	....	....	....	....	1	1	1	1	2	....	....	....	....	....	....	....	....	....	2	1	3	....	2	2	1	1	2
Taylor	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	1	1	2
Trempealeau	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Vernon	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	2	2	4
Vilas	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Walworth	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	1	....	1	1	1	2
Washburn	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Washington	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1
Waukesha	....	....	....	....	....	....	1	....	1	1	1	2	....	....	....	....	....	....	....	....	....	2	1	3	....	....	....	....	....	....
Waupaca	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	1	3	....	....	....	1	....	1
Waushara	....	....	....	....	....	....	....	....	....	....	2	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Winnebago	....	....	....	....	....	....	1	1	2	....	1	1	1	....	1	....	....	....	....	....	....	1	2	3	....	....	....	3	3	6
Wood	....	....	....	....	....	....	....	....	....	....	2	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	4
Total	....	....	....	....	....	....	8	22	30	40	29	69	1	....	1	....	....	....	....	....	....	69	68	137	9	4	13	88	70	158

TABLE NO. 27.—Continued. SHOWING THE TOTAL DEATHS IN EACH COUNTY FROM JAN. 1, 1912, TO DEC. 31, 1913, ARRANGED ACCORDING TO THE CAUSES OF DEATH.

Counties.	Glanders.			Anthrax.			Rabies.			Tetanus.			Mycoses.			Pellagra.			Beriberi.			Tuberculosis of the lungs.			Acute miliary tuberculosis.			Tuberculous meningitis.		
	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total	1912	1913	Total.	1912	1913	Total.
Adams	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	7	5	12	....	....	....	....	....	....
Ashland	....	....	....	....	....	....	....	....	....	2	....	2	....	....	....	....	....	....	....	....	....	23	17	40	1	....	1	....	3	3
Barron	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	24	17	41	....	....	....	....	1	1
Bayfield	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	10	6	16	..	....	....	....	1	1
Brown	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	44	42	86	1	....	1	5	11	16
Buffalo	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	14	8	22	....	....	....	....	....	....
Burnett	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	12	6	18	....	....	....	2	....	2
Calumet	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	12	13	25	3	....	3	1	1	2
Chippewa	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	37	35	72	....	....	....	2	2	4
Clark	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	16	12	28	....	....	....	1	....	1
Columbia	....	....	....	....	....	....	....	....	....	1	1	2	....	....	....	....	....	....	....	....	....	30	24	54	2	....	2	1	1	2
Crawford	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	12	12	24	....	....	....	....	2	2
Dane	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	2	3	....	....	....	55	64	119	1	5	6	2	7	9
Dodge	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	31	31	62	2	....	2	....	1	1
Door	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	9	6	15	....	1	1	....	....	....
Douglas	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	46	54	100	....	....	....	3	5	8
Dunn	....	....	....	....	....	....	....	....	....	2	....	2	....	....	....	....	....	....	....	....	....	21	24	45	....	....	....	1	....	1
Eau Claire	....	....	....	....	....	....	1	....	1	1	....	1	....	....	....	....	....	....	....	....	....	25	19	44	....	....	....	5	2	7
Florence	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4	5	9	....	....	....	....	....	....
Fond du Lac	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	53	39	92	....	1	1	4	2	6
Forest	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	6	8	....	....	....	1	....	1
Grant	....	....	....	....	....	....	....	....	....	....	1	1	....	1	1	....	....	....	....	....	....	19	18	37	....	....	....	1	1	2
Green	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	10	14	24	1	....	1	....	1	1
Green Lake	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	11	9	20	2	....	2	1	....	1
Iowa	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	14	10	24	....	....	....	....	....	....
Iron	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	7	7	14	1	....	1	1	....	1
Jackson	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	17	9	26	....	....	....	2	....	2
Jefferson	....	....	....	....	....	....	....	....	....	1	1	2	....	....	....	....	....	....	....	....	....	30	35	65	....	....	....	....	1	1
Juneau	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	14	22	36	....	1	1	....	....	....
Kenosha	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	24	27	51	....	....	....	6	1	7
Kewaunee	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	11	15	26	....	....	....	1	3	4

La Crosse											3	3									51	38	89	....	2	2	4	3	7
La Fayette																					10	8	18	....	....	....	....	....	....
Langlade																					4	9	11	....	1	1	....	....	....
Lincoln																					11	10	21	....	....	....	....	....	....
Manitowoc																					40	35	75	1	....	1	2	3	6
Marathon										2	1	3									40	36	76	3	2	5	3	....	3
Marinette								1	1	....	....	....									35	19	54	....	....	....	1	1	2
Marquette										....	1	1									7	11	18	....	....	....	1	1	2
Milwaukee										8	8	16				1	2	3			537	573	1110	12	19	31	33	31	64
Monroe										....	....	....									15	14	29	1	....	1	5	1	6
Oconto										1	....	1									15	18	33	....	....	....	1	2	3
Oneida										....	....	....									7	4	11	1	....	1	2	....	2
Outagamie										....	....	....									36	38	74	....	....	....	5	3	8
Ozaukee										....	....	....									6	14	20	....	....	....	1	....	1
Pepin										....	....	....									3	6	9	....	....	....	1	....	1
Pierce										....	....	....									13	15	28	....	....	....	....	....	....
Polk										1	1	2									21	17	38	3	....	3	....	1	1
Portage										....	....	....									23	19	42	1	....	1	....	1	1
Price										....	....	....									6	7	13	1	....	1	2	....	2
Racine					1	1				....	....	....									64	54	118	....	1	1	5	7	12
Richland										....	....	....									14	9	23	....	....	....	2	1	3
Rock										3	1	4									34	35	69	....	1	1	1	3	4
Rusk										....	....	....									5	5	10	1	....	1	1	1	2
St. Croix										1	....	1									18	16	34	1	1	2	....	....	....
Sauk										2	....	2									15	15	30	....	....	....	1	1	2
Sawyer										....	....	....									12	10	22	....	....	....	1	....	1
Shawano										1	....	1					1	1			24	25	49	1	....	1	....	3	3
Sheboygan										....	1	1									37	36	73	2	....	2	2	2	4
Taylor										....	....	....									6	1	7	....	....	....	....	....	....
Trempealeau										....	....	....									27	10	37	1	....	1	2	1	3
Vernon										....	....	....	1	....	1						23	15	38	1	....	1	3	1	4
Vilas										....	....	....									4	1	5	1	....	1	....	....	....
Walworth										....	....	....									22	20	42	3	1	4	....	1	1
Washburn										....	....	....									4	1	5	....	....	....	1	....	1
Washington										....	....	....									14	20	34	....	....	....	....	2	2
Waukesha										....	....	....									48	59	107	1	1	2	1	3	4
Waupaca										....	....	....									11	19	30	....	....	....	....	1	1
Waushara										....	....	....									7	9	16	....	....	....	....	....	....
Winnebago										....	1	1									47	48	95	1	3	4	5	5	10
Wood										....	1	1									28	19	47	1	....	1	....	1	1
Total	....	....	....	....	1	1	1	1	2	30	24	54	1	1	2	2	5	7	....	....	1988	1929	3917	51	40	91	127	126	253

TABLE NO. 27.—Continued. SHOWING THE TOTAL DEATHS IN EACH COUNTY FROM JAN. 1, 1912, TO DEC. 31, 1913, ARRANGED ACCORDING TO THE CAUSES OF DEATH.

Counties.	Abdominal tuberculosis.			Pott's disease.			White swellings.			Tuberculosis of other organs.			Disseminated tuberculosis.			Rickets.			Syphilis.			Gonococcus infection.			Cancer of the buccal cavity.			Cancer of the stomach, liver.		
	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.
Adams	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	1	1	....	....	....	....	....	....	1	4	5
Ashland	1	1	2	1	....	1	....	....	....	2	....	2	....	1	1	....	2	2	1	1	2	....	....	....	1	1	2	5	10	15
Barron	1	....	1	1	....	1	....	....	....	3	....	3	....	2	2	....	....	....	....	....	....	....	....	....	2	....	2	10	8	18
Bayfield	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2
Brown	1	4	5	1	....	1	....	....	....	1	1	2	1	1	2	....	....	....	2	5	7	....	....	....	1	2	3	22	21	43
Buffalo	....	1	1	....	1	1	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	1	....	1	6	1	7
Burnett	....	1	1	....	....	....	....	....	....	....	1	1	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	4	4	8
Calumet	2	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	2	4	6
Chippewa	2	....	2	1	....	1	....	....	....	1	....	1	....	1	1	....	....	....	....	....	....	....	....	....	1	....	1	4	12	16
Clark	1	1	2	1	1	2	....	....	....	....	....	....	1	....	1	....	....	....	1	....	1	....	....	....	1	....	1	5	8	13
Columbia	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	1	1	....	....	....	....	....	....	11	14	25
Crawford	....	....	....	....	....	1	....	1	1	....	....	....	1	....	1	....	....	....	....	1	1	....	....	....	1	....	1	6	8	14
Dane	3	9	12	1	2	3	....	....	....	1	1	2	2	1	3	....	....	....	1	2	3	....	1	1	4	2	6	43	36	79
Dodge	2	2	4	....	....	....	....	....	....	1	1	2	....	2	2	1	2	3	....	2	2	....	....	....	1	1	2	12	25	37
Door	....	1	1	....	....	....	....	....	....	1	1	2	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	6	10	16
Douglas	6	3	9	....	....	....	....	....	....	1	....	1	1	....	1	....	1	1	2	4	6	....	....	....	1	....	1	11	13	24
Dunn	2	....	2	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	1	1	12	8	20
Eau Claire	3	1	4	1	3	4	....	....	....	....	1	1	2	2	4	....	....	....	1	....	1	....	....	....	2	1	3	13	17	30
Florence	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1
Fond du Lac	1	6	7	1	....	1	....	....	....	....	1	1	....	1	1	....	....	....	....	2	2	....	....	....	1	2	3	26	31	57
Forest	....	....	....	....	....	....	....	....	....	....	1	1	1	....	1	....	....	....	2	....	2	....	....	....	....	....	....	....	....	....
Grant	....	4	4	....	1	1	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	1	1	....	....	....	25	10	35
Green	....	1	1	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4	12	16
Green Lake	2	1	3	....	....	....	....	2	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	11	5	16
Iowa	....	1	1	....	1	1	....	....	....	....	1	1	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	7	9	16
Iron	1	1	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2
Jackson	2	1	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4	8	12
Jefferson	1	....	1	....	2	2	....	....	....	....	....	....	....	1	1	....	....	....	....	1	1	....	....	....	....	1	1	20	16	36
Juneau	1	2	3	....	....	....	....	....	....	1	....	1	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	3	7	10
Kenosha	3	2	5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	10	12	22
Kewaunee	1	2	3	....	....	....	....	....	....	1	....	1	3	....	3	1	....	1	....	....	....	....	....	....	....	....	....	6	6	12

La Crosse	3	2	5	1	....	1	....	....	....	....	1	1	....	....	....	....	....	....	1	2	3	....	....	....	....	....	....	19	28	47
La Fayette	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	1	1	5	5	10
Langlade	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	1	1	....	....	....	....	....	....	1	....	1	5	6	11
Lincoln	1	1	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	8	9	17
Manitowoc	1	....	1	....	....	....	....	1	1	1	....	1	4	1	5	....	3	3	....	....	....	....	....	....	1	1	16	9	25
Marathon	3	2	5	....	2	2	....	1	1	....	....	....	1	1	2	....	....	....	2	....	2	....	....	....	5	5	20	20	40
Marinette	1	5	6	....	....	....	....	1	1	....	1	1	....	....	....	....	1	1	1	....	1	....	....	1	1	2	5	10	15
Marquette	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	1	....	1	3	6	9
Milwaukee	15	22	37	2	5	7	1	3	4	5	3	8	10	20	30	10	7	17	35	21	56	2	....	2	6	8	14	161	163	324
Monroe	1	1	2	....	1	1	....	....	....	....	....	....	1	....	1	....	....	....	1	2	3	....	....	....	....	2	2	16	11	27
Oconto	2	2	4	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	6	9	15
Oneida	3	....	3	....	1	1	....	....	....	1	....	1	....	....	....	....	....	....	1	....	1	....	....	....	....	1	1	2	1	3
Outagamie	3	1	4	2	2	4	....	....	....	....	....	....	1	....	1	....	1	1	....	....	....	....	....	....	1	1	2	23	25	48
Ozaukee	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	4
Pepin	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	3	2	5
Pierce	1	5	6	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	11	18	29
Polk	....	2	2	....	2	2	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2	....	....	....	1	2	3	9	5	14
Portage	....	....	....	....	....	....	....	....	....	1	1	2	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	6	8	14
Price	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	1	....	1	7	5	12
Racine	4	2	6	1	1	2	....	....	....	1	....	1	3	1	4	1	....	1	1	1	2	....	....	....	....	1	1	24	27	51
Richland	2	1	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	9	2	11
Rock	5	1	6	....	1	1	....	1	1	....	....	....	3	1	4	....	....	....	2	....	2	....	....	....	1	2	3	23	29	52
Rusk	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	1	....	1	....	....	....	....	....	....	2	2	4
St. Croix	3	....	3	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	1	1	....	....	....	1	....	1	8	8	16
Sauk	....	1	1	....	....	....	....	....	....	1	....	1	1	1	2	....	1	1	....	1	1	....	....	....	....	....	....	17	16	33
Sawyer	....	2	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	1	2	1	3
Shawano	3	2	5	....	....	....	....	....	....	....	....	....	....	....	....	1	1	2	1	1	2	....	1	1	2	2	4	10	4	14
Sheboygan	1	4	5	1	3	4	....	1	1	....	....	....	3	2	5	....	2	2	1	....	1	....	....	....	....	1	1	25	21	46
Taylor	....	....	....	....	....	....	....	....	....	....	1	1	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	5	4	9
Trempealeau	2	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	7	9	16
Vernon	2	2	4	2	....	2	....	....	....	....	1	1	1	....	1	....	....	....	1	1	2	....	....	....	....	....	....	8	5	13
Vilas	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Walworth	....	1	1	....	1	1	....	....	....	1	....	1	1	....	1	1	....	1	....	....	....	....	....	....	....	....	....	8	15	23
Washburn	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	4	7
Washington	....	2	2	1	....	1	....	....	....	....	....	....	....	1	1	1	....	1	....	2	2	....	....	....	....	....	....	8	10	18
Waukesha	2	2	4	....	1	1	1	....	1	....	....	....	....	2	2	....	....	....	....	2	2	....	....	....	....	....	....	18	19	37
Waupaca	1	1	2	....	....	....	....	1	1	1	....	1	....	....	....	....	....	....	....	1	1	....	....	....	....	1	1	11	13	24
Waushara	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	7	7	14
Winnebago	2	5	7	....	1	1	....	1	1	....	3	3	1	1	2	....	1	1	3	2	5	....	....	....	3	2	5	26	25	51
Wood	1	....	1	....	....	....	....	....	....	2	1	3	....	....	....	....	....	....	....	....	....	....	1	1	....	1	1	12	13	25
Total	99	118	217	19	34	53	2	13	15	29	21	50	47	47	94	17	28	45	65	58	123	2	4	6	41	48	89	850	899	1749

TABLE NO. 27.—Continued. SHOWING THE TOTAL DEATHS IN EACH COUNTY FROM JAN. 1, 1912, TO DEC. 31, 1913, ARRANGED ACCORDING TO THE CAUSES OF DEATH.

Counties.	Cancer of the peritoneum, intestines, rectum.			Cancer of the female genital organs.			Cancer of the breast.			Cancer of the skin.			Cancer of other organs, or organs not specified.			Other tumors, (tumors of the female genital organs excepted.)			Acute articular rheumatism.			Chronic rheumatism and gout.			Scurvy.			Diabetes.		
	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.
Adams	....	....	....	....	....	....	1	....	1	....	....	....	3	....	3	1	....	1	1	....	1	....	....	....	....	....	....	2	1	3
Ashland	....	1	1	....	....	....	4	4	2	....	2	3	2	5	2	1	3	....	3	3	....	1	1	....	....	....	1	1	2
Barron	3	2	5	2	4	6	2	....	2	2	....	2	1	4	5	3	2	5	1	2	3	1	1	2	....	1	1	4	6	10
Bayfield	....	....	....	....	....	....	....	2	2	....	....	....	2	1	3	....	....	....	....	4	4	....	2	2	....	....	....	....	....	....
Brown	6	2	8	8	2	10	1	3	4	1	1	2	7	7	14	5	1	6	6	5	11	2	1	3	....	....	....	7	11	18
Buffalo	3	1	4	....	....	....	1	....	1	....	....	....	....	2	2	....	....	....	....	1	1	....	....	....	....	....	....	2	3	5
Burnett	....	....	....	....	1	1	1	....	1	....	....	....	4	3	7	1	....	1	....	2	2	1	1	2	....	....	....	2	1	3
Calumet	....	1	1	....	....	....	1	2	3	....	1	1	1	2	3	....	....	....	2	1	3	....	....	....	....	....	....	3	4	7
Chippewa	....	5	5	2	....	2	1	1	2	1	2	3	3	1	4	1	1	2	3	4	7	....	4	4	....	....	....	5	3	8
Clark	1	4	5	1	4	5	....	....	....	....	1	1	1	1	2	....	....	....	2	2	4	....	2	2	....	....	....	3	1	4
Columbia	4	1	5	1	1	2	3	3	6	3	3	6	1	4	5	1	2	3	5	3	8	1	2	3	1	....	1	7	7	14
Crawford	3	1	4	....	1	1	1	1	2	1	1	2	5	1	6	....	4	4	1	1	2	3	1	4	....	....	....	2	1	3
Dane	7	12	19	9	8	17	5	6	11	3	2	5	8	10	18	3	2	5	10	5	15	2	2	4	....	....	....	11	13	24
Dodge	8	7	15	2	1	3	2	3	5	2	1	3	6	4	10	....	....	....	2	6	8	....	....	....	....	....	....	4	6	10
Door	....	1	1	2	....	2	2	1	3	1	1	2	3	1	4	....	....	....	1	....	1	....	1	1	....	....	....	2	4	6
Douglas	1	2	3	3	3	6	2	3	5	....	....	....	1	1	2	1	....	1	4	3	7	....	1	1	....	....	....	3	6	9
Dunn	2	1	3	1	1	2	....	2	2	1	2	3	....	1	1	....	....	....	5	2	7	....	....	....	....	....	....	2	5	7
Eau Claire	1	4	5	4	2	6	1	3	4	2	....	2	10	2	12	2	....	2	8	4	12	1	1	2	....	....	....	7	7	14
Florence	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1
Fond du Lac	5	7	12	6	2	8	5	5	10	....	....	....	5	11	16	3	....	3	4	3	7	2	....	2	....	....	....	16	10	26
Forest	....	....	....	1	....	1	....	....	....	....	1	1	....	....	....	....	....	....	....	3	3	1	....	1	....	....	....	....	....	....
Grant	5	5	10	3	4	7	1	2	3	2	....	2	6	1	7	1	1	2	3	1	4	3	....	3	....	....	....	2	9	11
Green	1	1	2	....	2	2	2	3	5	....	....	....	2	2	4	1	....	1	....	....	....	1	....	1	....	....	....	3	1	4
Green Lake	....	2	2	....	1	1	2	....	2	1	....	1	3	1	4	1	1	2	....	2	2	1	1	2	....	....	....	....	7	7
Iowa	....	3	3	1	1	2	3	3	6	2	....	2	1	1	2	....	....	....	1	2	3	2	....	2	....	....	....	1	2	3
Iron	....	1	1	....	1	1	1	1	2	1	....	1	1	1	2	....	....	....	2	2	4	....	....	....	....	....	....	1	1	2
Jackson	1	3	4	....	2	2	....	1	1	....	1	1	2	1	3	....	....	....	4	3	7	1	1	2	....	....	....	1	3	4
Jefferson	4	6	10	3	3	6	....	....	....	2	....	2	7	5	12	....	1	1	5	3	8	....	....	....	....	....	....	7	7	14
Juneau	1	2	3	1	1	2	....	1	1	1	1	2	4	....	4	1	....	1	1	....	1	5	....	5	....	....	....	1	2	3

Kenosha	3	2	5	2	....	2	1	5	6	....	....	....	1	4	5	2	1	3	3	4	7	1	....	1	1	....	1	5	4	9
Kewaunee	....	1	1	2	....	2	....	....	....	....	....	....	1	1	2	1	....	1	2	....	2	1	....	1	1	....	1	4	3	7
La Crosse	6	5	11	10	3	13	4	5	9	....	2	2	10	2	12	3	2	5	4	4	8	2	....	2	....	....	....	12	9	21
La Fayette	1	2	3	1	....	1	1	....	1	3	1	4	1	4	5	1	1	2	2	1	3	....	2	2	....	....	....	....	1	1
Langlade	....	2	2	5	1	6	....	2	2	....	....	....	....	1	1	....	....	....	2	1	3	....	....	....	....	....	....	2	3	5
Lincoln	....	1	1	1	5	6	....	1	1	1	....	1	2	1	3	....	1	1	....	1	1	....	....	....	....	....	....	3	1	4
Manitowoc	5	4	9	2	2	4	....	3	3	....	2	2	....	5	5	....	1	1	3	4	7	1	1	2	....	....	....	6	5	11
Marathon	2	3	5	1	3	4	5	....	5	1	....	1	4	1	5	1	1	2	8	6	14	5	....	5	....	....	....	6	10	16
Marinette	1	3	4	3	3	6	2	1	3	....	3	3	1	1	2	1	....	1	4	1	5	2	1	3	....	....	....	5	6	11
Marquette	....	2	2	....	....	....	1	....	1	....	....	....	2	1	3	....	....	....	....	1	1	....	....	....	....	....	....	1	2	3
Milwaukee	37	44	81	47	43	90	28	31	59	7	8	15	47	60	107	13	8	21	50	63	113	10	19	29	1	....	1	69	59	119
Monroe	1	6	7	3	4	7	1	....	1	2	1	3	1	2	3	1	....	1	....	....	....	1	....	1	....	....	....	5	8	13
Oconto	2	1	3	2	....	2	....	1	1	....	....	....	1	2	3	....	....	....	2	3	5	....	2	2	....	....	....	2	2	4
Oneida	....	....	....	1	....	1	1	....	1	1	....	1	....	....	....	....	1	1	1	....	1	....	....	....	....	....	....	3	1	4
Outagamie	4	5	9	5	4	9	3	....	3	1	2	3	1	4	5	1	3	4	1	1	2	1	3	4	....	....	....	8	12	20
Ozaukee	2	1	3	....	....	....	1	....	1	2	1	3	2	3	5	1	....	1	2	3	5	2	1	3	....	....	....	2	....	2
Pepin	....	....	....	....	....	....	....	1	1	....	1	1	1	1	2	....	....	....	....	1	1	....	....	....	....	....	....	....	1	1
Pierce	1	1	2	1	1	2	3	1	4	....	....	....	2	2	4	3	....	3	4	1	5	5	....	5	....	....	....	2	1	3
Polk	....	2	2	2	....	2	....	2	2	....	....	....	3	3	6	....	....	....	2	2	4	1	....	1	....	....	....	5	3	8
Portage	1	2	3	....	1	1	1	1	2	1	1	2	4	1	5	....	2	2	6	2	8	2	4	6	....	....	....	2	4	6
Price	....	2	2	1	1	2	....	....	....	1	....	1	....	2	2	....	1	1	....	....	....	....	....	....	....	....	....	1	3	4
Racine	2	5	7	4	3	7	6	3	9	1	1	2	5	10	15	2	3	5	2	7	9	2	2	4	....	1	1	9	6	15
Richland	....	....	....	1	1	2	1	1	2	....	....	....	1	2	3	....	....	....	....	1	1	....	....	....	....	....	....	3	3	6
Rock	5	5	10	6	5	11	3	1	4	....	2	2	9	11	20	....	3	3	3	4	7	6	4	10	1	....	1	5	6	11
Rusk	....	....	....	....	1	1	....	....	....	2	....	2	....	2	2	....	1	1	3	....	3	....	....	....	....	....	....	....	....	....
St. Croix	....	2	2	4	1	5	2	4	6	....	1	1	3	1	4	1	1	2	1	....	1	....	1	1	....	....	....	3	3	6
Sauk	3	1	4	1	1	2	....	....	....	....	1	1	3	5	8	1	1	2	3	1	4	2	1	3	....	....	....	6	1	7
Sawyer	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Shawano	....	2	2	2	3	5	1	1	2	....	1	1	2	2	4	1	3	4	2	....	2	....	1	1	....	....	....	3	2	5
Sheboygan	1	7	8	3	1	4	8	5	13	2	1	3	7	4	11	3	1	4	1	4	5	....	3	3	....	....	....	11	8	19
Taylor	....	1	1	....	....	....	....	....	....	....	....	....	....	3	3	....	....	....	1	1	2	....	1	1	....	....	....	1	....	1
Trempealeau	....	3	3	1	....	1	....	1	1	....	1	1	4	1	5	1	....	1	2	2	4	....	1	1	....	....	....	3	7	10
Vernon	1	2	3	1	2	3	2	....	2	....	2	2	3	3	6	....	....	....	4	2	6	....	1	1	....	....	....	1	2	3
Vilas	....	....	....	2	....	2	....	....	....	....	....	....	....	2	2	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....
Walworth	7	6	13	3	2	5	4	4	8	2	2	4	4	5	9	1	....	1	2	1	3	1	1	2	....	....	....	2	3	5
Washburn	....	....	....	....	1	1	1	1	2	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....
Washington	1	2	3	3	1	4	1	1	2	....	....	....	....	4	4	....	....	....	3	1	4	3	1	4	....	....	....	3	4	7
Waukesha	....	1	1	....	2	2	4	4	8	3	2	5	5	1	6	1	2	3	5	5	10	....	6	6	....	....	....	5	9	14
Waupaca	7	4	11	3	1	4	2	2	4	1	1	2	4	3	7	....	....	....	3	2	5	....	2	2	....	....	....	3	8	11
Waushara	1	1	2	....	....	....	1	1	2	1	....	1	....	2	2	....	....	....	2	2	4	....	2	2	1	....	1	4	3	7
Winnebago	14	7	21	8	4	12	3	4	7	2	1	3	5	13	18	5	2	7	3	5	8	3	2	5	....	....	....	8	10	18
Wood	2	6	8	5	1	6	....	1	1	....	2	2	9	2	11	....	2	2	....	1	1	1	....	1	....	....	....	3	2	5
Total	166	219	385	186	146	332	129	138	267	63	57	120	238	248	486	72	57	129	208	205	413	79	84	163	6	2	8	306	328	644

TABLE NO. 27.—Continued. SHOWING THE TOTAL DEATHS IN EACH COUNTY FROM JAN. 1, 1912, TO DEC. 31, 1913, ARRANGED ACCORDING TO THE CAUSES OF DEATH.

Counties.	Exophthalmic goiter.			Addison's disease.			Leuchaemia.			Anaemia chlorosis.			Other general diseases.			Alcoholism (acute or chronic.)			Chronic lead poisoning.			Other chronic occupation poisonings.			Other chronic poisonings.			Encephalitis.		
	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.
Adams	....	....	....	....	....	....	....	....	....	1	....	1	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1
Ashland	....	1	1	....	....	....	....	....	....	....	2	2	....	....	....	3	5	8	1	....	1	....	....	....	....	....	....	....	....	....
Barron	1	....	1	....	....	....	3	2	5	3	3	6	....	1	1	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....
Bayfield	....	....	....	....	....	....	1	....	1	3	....	3	....	1	1	1	2	3	....	....	....	....	....	....	....	....	....	....	....	....
Brown	....	1	1	....	....	....	....	1	1	5	6	11	....	1	1	....	2	2	....	1	1	....	1	1	....	....	....	2	1	3
Buffalo	1	....	1	....	....	....	....	....	....	....	1	1	....	....	....	....	3	3	....	....	....	....	....	....	....	....	....	....	....	....
Burnett	....	....	....	....	....	....	....	....	....	2	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Calumet	....	....	....	....	....	....	....	1	1	....	2	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Chippewa	1	1	2	....	....	....	....	....	....	3	4	7	....	....	....	....	2	2	....	....	....	....	....	....	....	....	....	....	....	....
Clark	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1
Columbia	1	....	1	....	....	....	2	1	3	3	1	4	1	....	1	1	1	2	....	....	....	....	....	....	....	....	....	....	1	1
Crawford	....	1	1	....	....	....	....	....	....	1	3	4	....	1	1	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....
Dane	2	1	3	....	....	....	....	2	2	2	2	4	1	....	1	4	8	12	....	....	....	....	....	....	....	....	....	....	1	1
Dodge	1	3	4	1	....	1	1	....	1	2	2	4	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1
Door	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1
Douglas	....	....	....	....	1	1	....	....	....	1	2	3	....	....	....	3	8	11	....	....	....	....	....	....	....	....	....	1	....	1
Dunn	....	....	....	....	....	....	1	....	1	2	3	5	....	....	....	....	2	2	....	....	....	....	....	....	....	....	....	....	....	....
Eau Claire	2	2	4	....	....	....	3	....	3	4	4	8	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	1	1
Florence	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	2	....	....	....	....	....	....	....	....	....	....	....	....
Fond du Lac	1	....	1	....	....	....	1	2	3	4	3	7	1	....	1	2	3	5	....	1	1	....	....	....	....	....	....	1	....	1
Forest	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....
Grant	....	1	1	....	....	....	....	2	2	1	3	4	....	2	2	2	1	3	....	....	....	....	....	....	....	....	....	....	....	....
Green	1	....	1	....	....	....	....	2	2	3	2	5	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Green Lake	....	1	1	1	....	1	....	1	1	4	2	6	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....
Iowa	1	2	3	....	1	1	....	....	....	....	4	4	....	....	....	1	1	2	....	....	....	....	....	....	....	....	....	....	....	....
Iron	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	6	8	....	....	....	....	....	....	....	....	....	1	....	1
Jackson	1	1	2	....	....	....	1	1	2	1	2	3	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....
Jefferson	1	....	1	....	....	....	....	1	1	8	1	9	....	....	....	1	2	3	....	....	....	....	....	....	....	....	....	....	....	....
Juneau	....	1	1	....	....	....	....	....	....	4	1	5	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	1	....	1
Kenosha	....	1	1	....	....	....	....	....	....	2	2	4	....	1	1	1	1	2	....	....	....	....	....	....	....	....	....	1	2	3
Kewaunee	....	....	....	....	....	....	....	....	....	....	3	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

La Crosse	1	....	1	....	....	....	2	2	4	2	6	8	1	....	1	3	2	5	....	....	....	....	....	....	....	....	....	....	....	....	....	....
La Fayette	....	....	....	....	....	....	....	....	....	2	2	4	....	....	....	1	2	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Langlade	1	1	2	....	....	....	....	1	1	1	....	1	....	1	1	....	2	2	....	....	....	....	....	....	....	....	....	....	....	1	1
Lincoln	....	1	1	....	....	....	....	....	....	....	1	1	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Manitowoc	2	1	3	....	....	....	3	....	3	2	....	2	....	....	....	1	1	2	....	....	....	....	....	....	....	....	....	....	....	2	1	3
Marathon	....	....	....	....	....	....	3	....	3	4	2	6	1	....	1	4	3	7	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Marinette	....	....	....	....	....	....	1	....	1	5	2	7	....	....	....	2	2	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Marquette	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Milwaukee	7	11	18	2	3	5	12	13	25	30	19	49	3	2	5	25	22	47	1	1	2	....	....	....	1	1	2	5	3	8
Monroe	1	....	1	....	....	....	....	....	....	5	....	5	....	....	....	....	2	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Oconto	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	1	1	2
Oneida	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1
Outagamie	....	1	1	....	....	....	1	....	1	6	2	8	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1
Ozaukee	....	....	....	....	....	....	....	....	....	3	....	3	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Pepin	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Pierce	....	....	....	....	....	....	1	....	1	2	3	5	....	....	....	1	1	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Polk	....	....	....	....	....	....	....	1	1	1	....	1	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1
Portage	1	....	1	....	....	....	....	....	....	4	1	5	....	....	....	....	2	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Price	....	....	....	....	....	....	....	....	....	2	1	3	....	....	....	1	3	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Racine	1	2	3	....	....	....	1	2	3	1	6	7	....	2	2	4	3	7	1	....	1	....	....	....	....	....	....	....	....	....	....	....
Richland	1	....	1	....	....	....	....	....	....	4	2	6	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	1	....	1
Rock	2	1	3	....	....	....	4	2	6	6	8	14	2	1	3	7	4	11	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Rusk	....	....	....	....	....	....	1	....	1	1	1	2	1	....	1	1	1	2	....	....	....	1	....	1	....	....	....	....	....	....	....	....
St. Croix	1	3	4	....	....	....	....	....	....	1	2	3	....	....	....	....	2	2	....	1	1	....	....	....	1	....	1	....	....	....	....	....
Sauk	....	1	1	....	....	....	....	1	1	....	3	3	....	....	....	2	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sawyer	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Shawano	....	....	....	2	....	2	3	2	5	2	3	5	....	3	3	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sheboygan	1	2	3	....	....	....	....	1	1	2	4	6	....	1	1	1	3	4	....	....	....	....	....	....	1	....	1	1	1	2	....
Taylor	....	....	....	....	....	....	....	....	....	....	1	1	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....
Trempealeau	....	....	....	....	1	1	....	....	....	2	4	6	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Vernon	1	....	1	....	....	....	....	....	....	1	....	1	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Vilas	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Walworth	2	....	2	....	....	....	1	....	1	6	4	10	....	....	....	2	2	4	....	....	....	....	....	....	....	....	....	....	....	1	1	2
Washburn	....	....	....	....	....	....	....	....	....	1	2	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Washington	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Waukesha	....	2	2	....	....	....	1	....	1	3	4	7	....	....	....	2	1	3	....	....	....	....	....	....	....	....	....	....	....	1	....	1
Waupaca	1	1	2	....	....	....	1	....	1	3	2	5	1	1	2	3	....	3	....	1	1	....	....	....	....	....	....	....	....	....	....	....
Waushara	....	....	....	....	....	....	....	1	1	....	1	1	....	1	1	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Winnebago	1	3	4	....	1	1	1	2	3	9	9	18	....	1	1	1	7	8	....	....	....	....	....	....	1	....	1	1	2	3	....
Wood	....	....	....	....	....	....	1	....	1	1	2	3	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	1	2	3	....
Total	39	47	86	6	8	14	51	44	95	172	156	328	15	23	38	92	125	217	3	5	8	1	1	2	4	1	5	25	22	47		

TABLE NO. 27.—Continued. SHOWING THE TOTAL DEATHS IN EACH COUNTY FROM JAN. 1, 1912, TO DEC. 31, 1913, ARRANGED ACCORDING TO THE CAUSES OF DEATH.

Counties.	Meningitis.			Locomotor ataxia.			Other diseases of the spinal cord.			Cerebral haemorrhage, apoplexy.			Softening of the brain.			Paralysis without specified cause.			General paralysis of the insane.			Other forms of mental alienation.			Epilepsy.			Convulsions. (Non-puerperal).		
	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.
Adams	....	2	2	....	....	....	1	....	1	3	6	9	....	....	....	1	....	1	....	....	....	....	1	1	....	1	1	....	....	....
Ashland	8	5	13	....	....	....	....	....	....	14	16	30	2	1	3	1	1	2	....	....	....	....	....	....	1	....	1	1	....	1
Barron	6	1	7	....	1	1	2	2	4	9	14	23	....	....	....	7	8	15	....	....	....	....	....	....	1	....	1	....	....	....
Bayfield	3	....	3	....	....	....	....	....	....	5	6	11	1	....	1	....	2	2	....	....	....	....	....	....	....	....	....	....	....	....
Brown	10	10	20	1	2	3	3	3	6	39	37	76	....	....	....	2	5	7	....	....	....	....	....	....	....	....	....	....	....	....
Buffalo	3	1	4	1	1	2	1	....	1	11	9	20	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....
Burnett	....	1	1	....	....	....	....	....	....	2	2	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Calumet	3	1	4	....	....	....	1	....	1	8	18	26	....	....	....	....	1	1	1	....	1	....	....	....	....	1	1	....	....	....
Chippewa	2	3	5	....	....	....	....	2	2	16	16	32	....	1	1	1	6	7	....	2	2	2	2	4	15	6	21	....	....	....
Clark	....	3	3	1	1	2	....	1	1	20	11	31	....	....	....	1	1	2	....	....	....	1	....	1	1	1	2	....	....	....
Columbia	8	8	16	....	1	1	3	....	3	22	27	49	1	....	1	1	6	7	2	....	2	....	....	....	2	1	3	....	....	....
Crawford	4	1	5	....	....	....	1	....	1	12	14	26	....	....	....	1	1	2	....	....	....	1	....	1	....	....	....	....	....	....
Dane	11	8	19	2	....	2	6	4	10	49	66	115	....	....	....	6	10	16	6	15	21	3	14	17	6	9	15	....	1	1
Dodge	3	5	8	....	2	2	3	3	6	28	37	65	....	1	1	2	4	6	....	....	....	1	....	1	1	2	3	....	....	....
Door	....	1	1	....	1	1	....	1	1	9	8	17	1	....	1	1	1	2	....	....	....	....	....	....	....	....	....	....	....	....
Douglas	9	7	16	1	....	1	2	2	4	16	25	41	....	....	....	2	3	5	1	....	1	....	6	6	4	2	6	....	....	....
Dunn	2	1	3	....	....	....	2	....	2	13	9	22	....	....	....	2	2	4	....	....	....	....	1	1	1	....	1	....	....	....
Eau Claire	7	6	13	2	....	2	3	2	5	30	27	57	2	1	3	3	2	5	2	....	2	1	5	6	1	....	1	....	1	1
Florence	....	1	1	....	....	....	....	....	....	3	2	5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Fond du Lac	5	1	6	....	....	....	....	2	2	42	36	78	2	....	2	11	5	16	....	....	....	1	3	4	4	....	4	1	....	1
Forest	1	1	2	....	....	....	....	....	....	1	3	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Grant	5	5	10	....	....	....	4	4	8	21	29	50	3	1	4	3	3	6	1	1	2	3	1	4	1	2	3	....	....	....
Green	3	2	5	....	....	....	....	3	3	19	26	45	....	....	....	1	4	5	....	....	....	....	1	1	3	1	4	....	....	....
Green Lake	....	....	....	....	....	....	1	3	4	11	16	27	....	....	....	1	1	2	....	....	....	....	....	....	....	....	....	....	....	....
Iowa	1	1	2	....	....	....	....	....	....	17	10	27	....	....	....	4	5	9	....	....	....	....	....	....	....	1	1	2	....	....
Iron	1	2	3	....	....	....	....	....	....	2	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Jackson	3	3	6	....	1	1	1	2	3	13	13	26	....	....	....	....	1	1	....	....	....	....	....	....	1	1	2	....	....	....
Jefferson	3	2	5	3	....	3	....	3	3	37	30	67	....	....	....	3	1	4	....	....	....	1	1	2	4	5	9	....	....	....
Juneau	3	1	4	1	....	1	2	2	4	20	13	33	....	....	....	5	1	6	....	....	....	....	1	1	....	1	1	....	....	....
Kenosha	2	4	6	....	1	1	2	2	4	26	9	35	....	....	....	2	2	4	....	....	....	....	....	....	....	....	....	....	....	....

Kewaunee	....	1	1	....	....	....	1	....	1	22	8	30	....	....	....	3	2	5	....	....	....	....	....	....	....	1	1	....	1	1
La Crosse	5	7	12	3	....	3	1	1	2	25	33	58	....	....	....	6	9	15	1	1	2	1	1	2	4	3	7	....	1	1
La Fayette	....	2	2	....	....	....	....	1	1	17	16	33	....	....	....	3	2	5	....	1	1	....	....	....	....	3	3	....	....	....
Langlade	3	2	5	....	....	....	2	1	3	11	11	22	....	....	....	2	3	5	....	....	....	....	....	....	....	....	....	....	....	....
Lincoln	2	4	6	2	1	3	....	....	....	8	12	20	....	....	....	....	....	....	....	....	....	....	....	....	1	1	2	....	....	....
Manitowoc	10	2	12	....	1	1	1	2	3	29	33	62	1	2	3	5	7	12	....	1	1	2	1	3	1	1	2	....	....	....
Marathon	6	5	11	1	1	2	2	1	3	22	23	45	2	....	2	10	3	13	1	1	2	....	....	....	4	2	6	1	....	1
Marinette	2	4	6	1	1	2	....	2	2	15	9	24	....	....	....	3	2	5	....	....	....	....	....	....	....	1	1	....	....	....
Marquette	1	....	1	1	....	1	....	1	1	5	5	10	....	....	....	1	1	2	....	....	....	....	....	....	....	1	1	....	....	....
Milwaukee	55	70	125	10	10	20	20	15	35	229	249	478	13	23	36	21	31	52	28	18	46	23	34	57	10	18	28	2	1	3
Monroe	....	4	4	1	1	2	....	1	1	19	16	35	....	2	2	....	1	1	....	....	....	....	....	....	....	3	3	....	....	....
Oconto	2	1	3	1	....	1	2	....	2	9	10	19	....	....	....	2	4	6	....	1	1	....	....	....	2	2	4	....	....	....
Oneida	1	....	1	2	....	2	1	....	1	7	1	8	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....
Outagamie	4	10	14	....	1	1	2	3	5	26	26	52	....	1	1	5	7	12	1	1	2	....	1	1	2	1	3	....	....	....
Ozaukee	1	1	2	....	....	....	....	1	1	12	17	29	....	....	....	2	....	2	1	1	2	....	....	....	....	....	....	....	....	....
Pepin	1	2	3	....	....	....	1	1	2	4	3	7	....	....	....	4	1	5	....	....	....	1	....	1	....	....	....	....	....	....
Pierce	2	3	5	....	....	....	....	2	2	19	16	35	....	....	....	1	3	4	1	....	1	1	....	1	....	3	3	....	....	....
Polk	1	1	2	1	....	1	....	....	....	10	8	18	....	....	....	4	5	9	2	....	2	....	....	....	....	1	1	....	....	....
Portage	7	6	13	1	....	1	1	2	3	18	14	32	1	....	1	5	4	9	....	....	....	....	....	....	....	1	1	....	....	....
Price	1	....	1	....	....	....	1	1	2	5	4	9	....	....	....	1	1	2	....	....	....	....	....	....	1	1	1	....	....	....
Racine	10	4	14	1	1	2	2	4	6	35	27	62	....	....	....	3	3	6	1	....	1	....	....	....	....	3	3	....	....	....
Richland	2	2	4	....	1	1	5	....	5	19	9	28	....	....	....	2	3	5	....	....	....	....	....	....	1	1	2	....	....	....
Rock	6	12	18	....	1	1	6	3	1	37	31	68	....	....	....	18	12	30	1	1	2	....	....	....	8	8	16	....	....	....
Rusk	1	2	3	....	....	....	....	....	....	4	4	8	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....
St. Croix	1	2	3	2	....	2	....	2	2	19	23	42	....	....	....	7	8	10	....	....	....	1	....	1	2	....	2	....	....	....
Sauk	1	....	1	....	....	....	1	....	1	28	25	53	....	....	....	11	11	22	....	1	1	1	....	1	1	....	1	....	1	1
Sawyer	....	....	....	....	....	....	....	....	....	3	....	3	....	....	....	1	....	1	....	....	....	....	....	....	....	1	1	....	....	....
Shawano	2	7	9	1	1	2	....	....	....	12	13	25	1	....	1	....	2	2	....	....	....	....	....	....	2	....	2	....	....	....
Sheboygan	9	5	14	....	1	1	1	2	3	53	41	94	....	1	1	....	1	1	1	....	1	....	3	3	3	3	6	....	....	....
Taylor	4	....	4	....	....	....	....	1	1	7	4	11	1	....	1	....	2	2	....	....	....	....	....	....	1	1	2	....	....	....
Trempealeau	6	12	18	....	1	1	2	2	4	12	19	31	1	....	1	1	6	7	....	....	....	2	4	6	....	2	2	....	....	....
Vernon	2	2	4	....	1	1	1	1	2	13	17	30	....	....	....	3	3	6	....	....	....	....	....	....	1	3	4	....	1	1
Vilas	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Walworth	1	2	3	....	....	....	2	....	2	19	24	43	2	1	3	7	10	17	....	....	....	....	2	2	....	5	5	....	....	....
Washburn	....	....	....	....	....	....	....	....	....	5	2	7	....	....	....	....	1	1	....	....	....	....	....	....	1	1	2	....	....	....
Washington	3	3	6	1	....	1	3	1	4	28	24	52	....	....	....	1	2	3	....	....	....	....	....	....	1	1	2	....	....	....
Waukesha	3	7	10	1	....	1	3	4	7	28	36	64	1	....	1	4	2	6	....	....	....	1	3	4	2	1	3	....	1	1
Waupaca	6	7	13	1	....	1	1	1	2	27	18	45	2	....	2	13	19	32	2	....	2	....	5	5	1	2	3	....	1	1
Waushara	....	1	1	....	....	....	1	1	2	4	10	14	....	....	....	2	6	8	....	....	....	....	....	....	....	....	....	....	....	....
Winnebago	9	6	15	4	1	5	4	5	9	63	57	120	3	....	3	8	9	17	14	11	25	7	19	26	2	4	6	1	....	1
Wood	4	4	8	....	1	1	....	1	1	19	15	34	2	....	2	3	1	4	....	4	4	3	2	5	3	5	8	1	....	1
Total	280	290	570	47	36	83	105	104	209	1466	1448	2914	42	35	77	223	258	481	67	61	128	57	111	168	102	117	219	7	9	16

TABLE NO. 27.—Continued. SHOWING THE TOTAL DEATHS IN EACH COUNTY FROM JAN. 1, 1912, TO DEC. 31, 1913, ARRANGED ACCORDING TO THE CAUSES OF DEATH.

Counties.	Convulsions of infants.			Chorea.			Neuralgia and neuritis.			Other diseases of the nervous system.			Diseases of the eyes and their annexa.			Diseases of the ears.			Pericarditis.			Acute endocarditis			Organic diseases of the heart.			Angina pectoris.		
	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.
Adams	1	3	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	12	8	20	....	1	1
Ashland	3	2	5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	2	....	4	4	22	10	32	2	....	2
Barron	1	5	6	....	1	1	....	1	1	....	1	1	....	1	1	....	....	....	1	1	2	1	1	2	12	22	34	4	2	6
Bayfield	1	....	1	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	1	1	5	5	10	1	....	1
Brown	14	7	21	....	....	....	....	1	1	1	5	6	....	....	....	1	....	1	....	4	4	3	11	14	30	34	64	3	1	4
Buffalo	3	2	5	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	1	1	2	10	3	13	1	3	4
Burnett	....	3	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6	6	12	....	....	....
Calumet	1	4	5	....	....	....	1	....	1	....	1	1	....	....	....	....	....	....	....	....	....	1	3	4	10	7	17	2	1	3
Chippewa	3	2	5	....	....	....	....	....	....	11	13	24	....	....	....	1	....	1	....	....	....	....	....	....	39	25	64	2	....	2
Clark	3	2	5	1	....	1	....	....	....	....	1	1	....	....	....	2	....	2	1	....	1	4	3	7	21	27	48	2	1	3
Columbia	....	2	2	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	1	5	6	26	31	57	1	5	6
Crawford	2	....	2	....	....	....	1	....	1	1	2	3	....	....	....	....	....	....	....	....	....	1	4	5	16	10	26	....	2	2
Dane	5	6	11	....	....	....	....	1	1	6	1	7	....	....	....	2	....	2	2	....	2	3	9	12	75	59	134	5	3	8
Dodge	10	3	13	....	....	....	1	....	1	....	2	2	....	....	....	....	....	....	....	....	....	4	11	15	56	41	97	1	3	4
Door	5	1	6	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	1	1	2	3	5	14	8	22	....	1	1
Douglas	8	2	10	....	....	....	1	....	1	....	1	1	....	....	....	....	1	1	1	2	3	3	6	9	21	40	61	1	....	1
Dunn	1	2	3	....	....	....	....	....	....	1	....	1	....	....	....	....	1	1	....	....	....	....	2	2	28	25	53	2	1	3
Eau Claire	4	1	5	....	....	....	....	1	1	2	....	2	....	....	....	....	1	1	....	3	3	2	10	12	26	31	57	1	4	5
Florence	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	4	6	....	....	....
Fond du Lac	6	7	13	....	....	....	....	....	....	4	5	9	1	....	1	53	105	5	7	12	1	....	1	1	1	2	4	5	9	52
Forest	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	2	1	3	....	1	1
Grant	1	4	5	1	....	1	....	1	1	3	1	4	....	....	....	1	3	4	1	3	4	3	4	7	53	31	84	1	3	4
Green	1	2	3	....	1	1	....	2	2	1	....	1	....	....	....	....	....	....	....	....	....	1	3	4	14	12	26	5	4	9
Green Lake	....	2	2	....	....	....	....	1	1	1	....	1	....	....	....	....	....	....	....	1	1	4	4	8	17	15	32	1	1	2
Iowa	2	3	5	....	....	....	....	1	1	2	....	2	....	....	....	1	....	1	....	....	....	....	2	2	24	19	43	2	2	4
Iron	2	1	3	....	....	....	....	....	....	....	3	3	....	....	....	....	....	....	....	1	1	....	....	....	6	....	6	....	....	....
Jackson	....	3	3	....	....	....	....	....	....	1	1	2	....	....	....	....	....	....	....	1	1	....	2	2	16	15	31	1	2	3
Jefferson	4	3	7	....	....	....	....	....	....	1	2	3	....	....	....	....	1	1	....	....	....	1	5	6	40	50	90	2	4	6
Juneau	2	3	5	....	....	....	....	....	....	1	1	2	....	....	....	....	....	....	....	....	....	....	....	....	18	13	31	1	5	6
Kenosha	6	4	10	....	....	....	1	....	1	1	5	6	....	....	....	....	....	....	....	1	1	1	5	6	31	22	53	1	1	2
Kewaunee	5	1	6	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	2	....	1	1	16	5	21	....	....	....

La Crosse	5	4	9	....	....	....	....	....	....	3	2	5	....	1	1	1	....	1	1	....	1	2	15	17	66	57	123	....	1	1
La Fayette	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	17	14	31	2	....	2
Langlade	2	1	3	....	....	....	....	....	....	....	....	....	....	....	....	1	1	2	2	....	2	1	2	3	8	10	18	2	1	3
Lincoln	2	4	6	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	3	3	13	11	24	1	....	1
Manitowoc	5	7	12	....	....	....	....	....	....	....	2	2	1	....	1	1	....	1	1	1	2	1	9	10	45	35	80	3	2	5
Marathon	13	20	33	....	....	....	1	....	1	2	1	3	....	....	....	1	1	2	....	....	....	3	2	5	37	36	73	2	1	3
Marinette	7	4	11	....	....	....	....	....	....	3	....	3	....	....	....	....	....	....	1	2	3	2	3	5	35	28	63	....	1	1
Marquette	1	2	3	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	1	1	14	9	23	1	....	1
Milwaukee	81	52	133	5	2	7	4	4	8	20	15	35	4	3	7	6	3	9	6	6	12	55	116	171	536	445	981	17	16	33
Monroe	1	5	6	....	....	....	1	....	1	2	1	3	....	....	....	....	....	....	1	1	2	1	6	7	26	41	67	4	6	10
Oconto	4	2	6	....	....	....	....	....	....	1	1	2	....	....	....	....	....	....	....	....	....	....	2	2	17	16	33	....	1	1
Oneida	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	14	7	21	....	....	....
Outagamie	6	11	17	1	....	1	1	....	1	1	....	1	....	1	1	....	2	2	....	1	1	3	6	9	43	45	88	4	1	5
Ozaukee	4	1	5	....	....	....	....	1	1	1	....	1	....	....	....	....	....	....	....	....	....	2	1	3	12	16	28	2	1	3
Pepin	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	13	5	18	2	....	2
Pierce	....	1	1	....	....	....	....	1	1	1	2	3	....	....	....	....	....	....	1	2	3	3	1	4	16	36	52	....	1	1
Polk	....	2	2	....	....	....	....	....	....	1	1	2	....	....	....	....	1	1	....	1	1	1	....	1	22	20	42	2	....	2
Portage	3	1	4	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	4	2	6	33	29	62	....	1	1
Price	2	5	7	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	10	8	18	1	....	1
Racine	12	8	20	....	....	....	1	....	1	4	2	6	....	....	....	....	1	1	....	....	....	5	5	10	46	41	87	3	2	5
Richland	....	2	2	....	....	....	....	....	....	2	1	3	....	....	....	....	....	....	1	....	1	2	2	4	18	14	32	1	1	2
Rock	3	5	8	1	....	1	1	....	1	1	5	6	....	....	....	2	....	2	....	....	....	6	4	10	62	51	113	2	1	4
Rusk	....	3	3	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	3	3	10	8	18	....	....	....
St. Croix	2	3	5	....	....	....	1	1	2	....	1	1	....	....	....	....	....	....	....	....	....	1	4	5	26	18	44	1	....	1
Sauk	4	2	6	....	....	....	....	....	....	3	1	4	....	....	....	....	....	....	....	1	....	1	1	1	2	22	21	43	3	5	8
Sawyer	2	2	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	3	4	3	7	....	....	....
Shawano	5	4	9	....	....	....	....	....	....	....	2	2	....	....	....	....	....	....	....	1	....	1	....	3	3	19	26	45	1	1	2
Sheboygan	17	12	29	....	....	....	....	....	....	3	2	5	....	....	....	2	....	2	2	....	2	1	8	9	44	51	95	....	....	....
Taylor	3	2	5	....	....	....	....	....	....	....	1	1	....	....	....	1	....	1	....	....	....	1	....	1	13	8	21	1	....	1
Trempealeau	....	2	2	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	21	30	51	1	1	2
Vernon	3	2	5	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	1	1	2	6	1	7	21	20	41	....	3	3
Vilas	2	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	1	2	3	....	....	....
Walworth	2	....	2	....	....	....	1	1	2	3	3	6	....	....	....	1	....	1	....	....	....	1	3	4	36	40	76	2	1	3
Washburn	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	....	1	1	7	4	11	2	1	3
Washington	3	2	5	1	....	1	....	....	....	1	2	3	....	....	....	....	....	....	....	....	....	....	1	1	24	19	43	....	....	....
Waukesha	5	1	6	....	....	....	1	....	1	2	....	2	....	....	....	....	....	....	....	....	....	3	5	8	47	47	94	2	1	3
Waupaca	5	3	8	1	....	1	....	....	....	....	2	2	....	....	....	....	....	....	....	....	....	4	1	5	30	39	69	6	3	9
Waushara	2	....	2	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	3	....	3	1	1	2	10	7	17	2	1	3
Winnebago	10	10	20	....	....	....	....	1	1	2	6	8	....	1	1	1	1	2	1	1	2	10	11	21	56	70	126	5	7	12
Wood	2	5	7	....	....	....	1	....	1	4	1	5	....	....	....	....	....	....	1	....	1	2	....	2	27	19	46	....	1	1
Total	313	271	584	11	4	15	19	19	38	101	104	205	6	7	13	26	18	44	34	39	73	167	332	499	2241	2038	4279	122	120	242

TABLE NO. 27.—Continued. SHOWING THE TOTAL DEATHS IN EACH COUNTY FROM JAN. 1, 1912, TO DEC. 31, 1913, ARRANGED ACCORDING TO THE CAUSES OF DEATH.

Counties.	Diseases of the arteries, atheroma aneurysm, etc.			Embolism and thrombosis.			Diseases of the veins.			Diseases of the lymphatic system, (lymphangitis, etc).			Haemorrhage; other diseases of the circulatory system.			Diseases of the nasal fossae.			Diseases of the larynx.			Diseases of the thyroid body.			Acute bronchitis.			Chronic bronchitis.		
	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.
Adams	2	1	3	1	....	1	....	....	....	....	....	....	1	....	1	....	....	....	1	....	1	....	....	....	1	1	2	1	....	1
Ashland	1	4	5	2	1	3	....	....	....	....	1	1	....	1	1	....	....	....	....	....	....	....	....	....	2	....	2	....	3	3
Barron	1	4	5	....	1	1	....	....	....	....	....	....	....	1	1	....	....	....	1	....	1	....	....	....	9	3	12	1	1	2
Bayfield	2	1	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	1	1	4	....	4	....	....	....
Brown	8	11	19	2	2	4	....	....	....	....	1	1	1	....	1	....	....	....	....	2	2	....	1	1	3	6	9	2	3	5
Buffalo	2	2	4	2	....	2	1	....	1	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	1	2	3	2	1	3
Burnett	2	1	3	....	1	1	....	....	....	....	....	....	1	1	2	....	....	....	....	....	....	....	....	....	2	2	4	....	2	2
Calumet	1	3	4	1	....	1	....	....	....	1	....	1	....	....	....	1	....	1	....	....	....	....	....	....	1	....	1	....	....	....
Chippewa	1	4	5	1	....	1	1	....	1	....	....	....	1	....	1	....	1	1	2	....	2	....	....	....	3	....	3	4	....	4
Clark	1	2	3	1	1	2	....	....	....	....	....	....	1	....	1	....	....	....	2	....	2	....	....	....	1	3	4	1	2	3
Columbia	7	5	12	....	1	1	....	1	1	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	4	5	9	2	5	7
Crawford	3	3	6	....	2	2	....	....	....	....	....	....	1	1	2	....	....	....	....	....	....	2	....	2	....	1	1	2	2	4
Dane	11	12	23	3	5	8	....	....	....	....	....	....	....	1	1	....	1	1	1	1	2	1	1	2	8	9	17	4	4	8
Dodge	5	6	11	2	4	6	1	....	1	....	....	....	....	....	....	....	....	....	1	2	3	1	....	1	6	6	12	7	6	13
Door	5	3	8	1	1	2	2	....	2	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	1	4	5	....	1	1
Douglas	3	4	7	2	2	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	2	5	7	1	2	3
Dunn	2	8	10	....	1	1	....	....	....	....	....	....	1	....	1	....	....	....	1	....	1	....	....	....	3	5	8	2	1	3
Eau Claire	2	5	7	3	2	5	....	2	2	....	....	....	2	....	2	....	....	....	1	....	1	....	....	....	1	3	4	2	1	3
Florence	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	1	1	2
Fond du Lac	11	4	15	3	6	9	....	....	....	....	2	2	1	....	1	....	....	....	....	1	1	1	....	1	4	10	14	11	2	13
Forest	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	1	....	1	....	....	....	2	....	2	....	....	....
Grant	6	7	13	1	2	3	....	....	....	....	....	....	1	....	1	....	....	....	2	....	2	....	....	....	6	8	14	10	5	15
Green	6	2	8	....	5	5	....	1	1	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	3	2	5	....	1	1
Green Lake	6	10	16	....	1	1	....	....	....	....	1	1	....	....	....	....	....	....	....	1	1	....	....	....	2	5	7	....	1	1
Iowa	1	3	4	....	1	1	....	....	....	1	....	1	....	1	1	....	....	....	....	....	....	....	1	1	2	1	3	3	3	6
Iron	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	3	1	....	1
Jackson	1	2	3	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	....	3	3
Jefferson	10	3	13	2	6	8	....	....	....	....	....	....	....	2	2	1	....	1	....	....	....	....	....	....	12	7	19	6	5	11
Juneau	5	3	8	1	1	2	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	1	1	1	1	2
Kenosha	7	3	10	....	1	1	....	....	....	....	1	1	....	1	1	....	....	....	2	1	3	....	1	1	2	1	3	4	....	4

Kewaunee	5	1	6	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	5	8	2	1	3
La Crosse	3	8	11	2	....	2	....	....	....	1	2	3	....	1	1	....	....	....	....	....	....	2	....	2	1	1	2	3	3	6
La Fayette	5	1	6	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	1	1	....	....	....
Langlade	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	1	....	1	....	....	....
Lincoln	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	....	1	1
Manitowoc	9	11	20	....	4	4	....	....	....	1	1	....	....	....	....	....	....	....	1	....	1	....	1	1	3	8	11	7	6	13
Marathon	4	5	9	3	....	3	1	1	2	....	....	....	2	1	3	....	....	....	....	1	1	....	....	....	3	3	6	1	1	2
Marinette	....	6	6	....	1	1	....	1	1	1	....	1	1	1	2	....	....	....	....	....	....	....	....	....	2	....	2	2	2	4
Marquette	....	2	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	1	....	1	2	1	3
Milwaukee	91	100	191	23	18	41	4	8	12	5	1	6	3	4	7	2	3	5	12	9	21	2	3	5	122	95	217	32	48	80
Monroe	7	4	11	2	1	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4	2	6	1	4	5
Oconto	7	3	10	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	4	2	6	2	1	3
Oneida	....	....	....	1	....	1	....	....	....	1	....	1	....	1	1	....	....	....	....	....	....	....	....	....	2	....	2	1	....	1
Outagamie	....	4	4	2	2	4	1	....	1	....	....	....	1	1	2	....	....	....	1	....	1	....	....	....	6	8	14	9	5	14
Ozaukee	5	2	7	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	4	1	5	3	2	5
Pepin	2	....	2	1	2	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	1	3	....	1	1
Pierce	4	2	6	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	1	1	2	....	....	....	5	1	6	1	2	3
Polk	....	4	4	2	2	4	1	...	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	3	5	1	2	3
Portage	5	5	10	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	1	....	1	5	3	8	1	3	4
Price	4	1	5	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	1
Racine	3	4	7	2	1	3	....	....	....	....	....	....	....	1	1	....	....	....	1	2	3	....	....	....	10	5	15	3	2	5
Richland	1	2	3	....	1	1	....	1	1	....	....	....	....	....	....	....	....	....	1	....	1	....	1	1	2	3	5	3	2	5
Rock	9	8	17	2	6	8	....	....	....	....	1	1	....	....	....	....	1	1	....	1	1	....	....	....	5	4	9	3	1	4
Rusk	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1
St. Croix	4	2	6	2	2	4	....	....	....	1	....	1	....	1	1	....	....	....	1	1	2	....	....	....	6	4	10	2	3	5
Sauk	5	5	10	1	2	3	....	1	1	1	....	1	....	....	....	....	....	....	1	1	2	....	....	....	6	3	9	5	2	7
Sawyer	....	1	1	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	2	....	....	....
Shawano	5	8	13	2	3	5	....	1	1	....	....	....	1	....	1	....	....	....	....	....	....	....	1	1	9	4	13	2	2	4
Sheboygan	2	15	17	4	1	5	....	2	2	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	11	11	22	7	9	16
Taylor	6	1	7	1	1	2	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	2	2	2	1	3
Trempealeau	2	4	6	....	....	....	....	....	....	1	1	1	....	1	....	....	....	....	....	....	....	....	....	....	1	1	2	1	1	2
Vernon	5	8	13	2	....	2	....	....	....	....	....	....	....	....	....	....	....	....	2	1	3	....	....	....	4	2	6	1	5	6
Vilas	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Walworth	4	5	9	1	3	4	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	1	1	2	5	2	7	4	5	9
Washburn	....	1	1	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	1	....	1	....	....	....
Washington	....	7	7	1	1	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	2	5	1	1	2
Waukesha	8	12	20	2	1	3	1	1	2	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	5	3	8	2	2	4
Waupaca	2	5	7	2	2	4	1	....	1	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	4	3	7	3	5	8
Waushara	1	6	7	1	....	1	1	1	2	....	....	....	1	....	1	....	....	....	1	1	2	....	....	....	4	2	6	2	1	3
Winnebago	22	24	46	7	4	11	1	....	1	....	....	....	1	....	1	....	....	....	....	1	1	....	....	....	6	5	11	1	5	6
Wood	4	10	14	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	1	1	2	....	1	1	3	5	8	1	1	2
Total	347	405	752	97	106	203	17	21	38	12	14	26	24	24	48	4	7	11	44	31	75	16	15	31	345	290	635	180	188	368

TABLE NO. 27.—Continued. SHOWING THE TOTAL DEATHS IN EACH COUNTY FROM JAN. 1, 1912, TO DEC. 31, 1913, ARRANGED ACCORDING TO THE CAUSES OF DEATH.

Counties.	Broncho pneumonia.			Pneumonia.			Pleurisy.			Pulmonary congestion, pulmonary apoplexy.			Gangrene of the lung.			Asthma.			Pulmonary emphysema.			Other diseases of the respiratory system.			Diseases of the mouth and annexa.			Diseases of the pharynx.		
	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.
Adams	1	....	1	6	8	14	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Ashland	1	2	3	18	24	42	....	1	1	....	....	....	....	....	....	....	1	1	....	....	....	3	1	4	....	....	....	1	1	2
Barron	6	10	16	17	29	46	1	....	1	3	2	5	....	....	....	1	....	1	....	....	....	1	1	2	....	....	....	....	....	....
Bayfield	2	1	3	7	8	15	....	....	....	1	....	1	....	....	....	2	2	4	....	....	....	2	....	2	....	....	....	....	....	....
Brown	29	26	55	41	30	71	1	3	4	3	6	9	....	....	....	2	2	4	....	....	....	5	1	6	....	....	....	....	....	....
Buffalo	4	5	9	7	7	14	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	4
Burnett	1	2	3	1	3	4	1	....	1	....	....	....	....	....	....	1	1	2	1	....	1	....	1	1	....	....	....	....	....	....
Calumet	2	1	3	1	8	9	1	....	1	1	....	1	....	....	....	2	....	2	....	....	....	....	....	....	....	....	....	2	....	2
Chippewa	15	8	23	16	21	37	1	4	5	3	1	4	....	....	....	1	1	2	....	....	....	2	1	3	....	....	....	....	....	....
Clark	2	5	7	14	11	25	....	2	2	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	1	1	2	....	1	1
Columbia	10	6	16	23	23	46	1	....	1	1	7	8	....	....	....	....	....	....	....	....	....	3	1	4	....	....	....	....	....	....
Crawford	2	3	5	9	14	23	....	....	....	2	2	4	....	....	....	3	....	3	....	....	....	....	....	....	....	....	....	2	2	4
Dane	17	15	32	41	44	85	5	6	11	11	16	27	....	1	1	2	1	3	....	....	....	4	2	6	....	....	....	1	4	5
Dodge	4	15	19	12	21	33	3	3	6	....	6	6	....	....	....	1	4	5	....	1	1	1	1	2	....	....	....	2	3	5
Door	3	3	6	6	3	9	1	1	2	1	....	1	1	....	1	1	1	2	....	....	....	2	....	2	....	....	....	1	....	1
Douglas	9	18	27	22	31	53	....	....	....	....	....	....	....	....	....	1	2	3	....	....	....	1	....	1	1	....	1	....	....	....
Dunn	3	11	14	6	12	18	1	1	2	1	1	2	....	....	....	1	....	1	....	1	1	....	2	2	....	....	....	....	....	....
Eau Claire	7	7	14	13	11	24	2	3	5	3	3	6	....	....	....	3	3	6	....	3	3	1	2	3	....	1	1	....	1	1
Florence	....	1	1	2	....	2	....	....	....	....	2	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Fond du Lac	22	24	46	27	20	47	1	2	3	4	4	8	....	....	....	1	3	4	1	....	1	2	3	5	....	....	....	....	1	1
Forest	3	6	9	6	5	11	....	....	....	1	....	1	....	....	....	....	2	2	....	....	....	1	....	1	....	....	....	....	....	....
Grant	6	12	18	16	19	35	1	....	1	4	3	7	....	....	....	3	2	5	....	1	1	2	1	3	....	1	1	....	....	....
Green	3	4	7	9	12	21	1	1	2	2	2	4	....	....	....	....	....	....	....	1	1	1	....	1	....	....	....	....	3	3
Green Lake	....	5	5	3	6	9	1	....	1	....	....	....	....	....	....	2	1	3	....	....	....	1	....	1	....	....	....	....	....	....
Iowa	4	1	5	18	6	24	1	....	1	3	1	4	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....
Iron	4	4	8	5	5	10	....	....	....	....	1	1	....	....	....	....	1	1	....	....	....	1	....	1	....	....	....	1	....	1
Jackson	5	4	9	6	8	14	....	....	....	....	1	1	....	....	....	2	....	2	....	....	....	....	....	....	....	....	....	....	....	....
Jefferson	10	11	21	15	9	24	3	....	3	4	3	7	....	....	....	....	1	1	....	....	....	....	1	1	1	....	1	1	....	1
Juneau	2	4	6	14	12	26	2	1	3	3	....	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Kenosha	8	10	18	24	12	36	4	1	5	4	2	6	....	....	....	1	1	2	....	1	1	2	1	3	....	....	....	....	....	....
Kewaunee	3	6	9	5	2	7	2	....	2	1	....	1	....	....	....	....	4	4	....	....	....	....	1	1	....	....	....	....	....	....

La Crosse	9	11	20	28	26	54	1	1	2	3	....	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
La Fayette	4	3	7	14	5	19	1	....	1	3	3	6	....	....	....	1	1	2	....	....	....	....	....	....	....	....	....	1	....	1
Langlade	3	7	10	12	13	25	....	1	1	....	1	1	....	....	....	1	1	2	....	....	....	....	....	....	....	....	....	....	1	1
Lincoln	5	3	8	9	14	23	1	....	1	1	1	2	....	....	....	....	2	2	....	....	....	1	....	1	....	....	....	....	....	....
Manitowoc	7	8	15	17	26	43	3	2	5	2	....	2	....	3	3	1	1	2	....	....	....	1	....	1	....	....	....	1	....	1
Marathon	22	19	41	32	25	57	....	1	1	6	5	11	....	....	....	1	2	3	....	2	2	....	3	3	1	....	1	....	....	....
Marinette	11	9	20	27	20	47	2	....	2	4	4	8	1	....	1	....	2	2	....	....	....	3	1	4	....	....	....	....	2	2
Marquette	2	1	3	3	6	9	1	1	2	2	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Milwaukee	296	207	503	349	373	722	16	24	40	44	45	89	3	3	6	13	10	23	8	3	11	13	16	29	1	6	7	12	5	17
Monroe	5	14	19	20	28	48	....	....	....	1	1	2	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....
Oconto	6	4	10	5	10	15	2	....	2	2	4	6	....	....	....	2	....	2	....	....	....	1	1	2	....	....	....	....	....	....
Oneida	5	1	6	3	4	7	....	....	....	2	....	2	....	....	....	1	1	2	....	....	....	....	....	....	....	....	....	....	1	1
Outagamie	10	19	29	19	35	54	2	....	2	4	....	4	....	2	2	2	1	3	1	....	1	1	2	3	....	....	....	....	2	2
Ozaukee	3	6	9	8	9	17	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....
Pepin	2	5	7	1	7	8	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	1	1
Pierce	5	9	14	10	15	25	....	1	1	4	2	6	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....
Polk	1	6	7	11	6	17	....	1	1	....	....	....	....	1	1	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....
Portage	4	10	14	10	9	19	....	1	1	....	....	....	....	1	1	2	1	3	....	1	1	....	1	1	....	....	....	1	1	2
Price	3	8	11	4	3	7	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Racine	21	25	46	34	40	74	2	....	2	9	5	14	....	....	....	4	3	7	....	1	1	1	3	4	....	1	1	....	4	4
Richland	4	6	10	19	10	29	....	1	1	4	3	7	1	....	1	2	....	2	1	....	1	....	1	1	....	....	....	....	....	....
Rock	9	17	26	43	32	75	....	2	2	10	5	15	....	....	....	....	1	1	....	....	....	3	1	4	....	....	....	2	2	4
Rusk	2	5	7	2	4	6	....	1	1	3	1	4	....	....	....	....	1	1	....	....	....	....	....	....	....	1	1	....	1	1
St. Croix	1	3	4	3	19	12	....	1	1	5	....	5	....	....	....	....	3	3	....	....	....	2	1	3	....	....	....	....	....	....
Sauk	5	10	15	18	12	30	....	....	....	1	5	6	....	....	....	....	3	3	....	....	....	3	1	4	....	....	....	....	....	....
Sawyer	....	....	....	6	14	20	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Shawano	11	8	19	12	19	31	1	....	1	5	3	8	....	....	....	3	2	5	....	....	....	....	1	1	1	2	3	....	....	....
Sheboygan	8	17	25	23	34	57	....	2	2	5	9	14	....	....	....	3	1	4	....	....	....	1	2	3	....	....	....	....	1	1
Taylor	4	2	6	14	10	24	1	....	1	....	1	1	....	....	....	1	1	2	....	....	....	1	....	1	....	....	....	1	....	1
Trempealeau	4	3	7	26	13	39	....	1	1	3	3	6	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....
Vernon	10	4	14	19	14	33	2	....	2	2	1	3	....	....	....	2	3	5	....	....	....	....	....	....	....	1	1	....	....	....
Vilas	....	1	1	1	5	6	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Walworth	1	10	11	19	26	45	1	1	2	5	2	7	....	....	....	1	1	2	....	....	....	....	1	1	....	....	....	....	....	....
Washburn	....	1	1	7	3	10	1	1	2	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Washington	15	3	18	11	11	22	1	....	1	3	....	3	....	....	....	1	3	4	2	....	2	1	....	1	....	1	1	....	....	....
Waukesha	5	6	11	24	20	44	....	1	1	9	1	10	1	....	1	....	1	1	....	....	....	1	....	1	....	....	....	2	....	2
Waupaca	1	5	6	31	28	59	1	1	2	6	3	9	....	....	....	1	2	3	....	....	....	....	1	1	....	....	....	....	....	....
Waushara	5	3	8	3	9	12	....	....	....	1	1	2	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	1	1
Winnebago	11	11	22	43	41	84	2	5	7	11	7	18	....	....	....	1	2	3	1	1	2	2	1	3	....	....	....	....	2	2
Wood	....	6	6	12	24	36	2	....	2	3	4	7	....	....	....	2	1	3	....	....	....	....	....	....	....	....	....	....	....	....
Total	708	726	1434	1362	1446	2808	77	80	157	219	186	405	7	11	18	77	85	162	15	16	31	71	61	132	6	15	21	29	43	72

TABLE NO. 27.—Continued. SHOWING THE TOTAL DEATHS IN EACH COUNTY FROM JAN. 1, 1912, TO DEC. 31, 1913, ARRANGED ACCORDING TO THE CAUSES OF DEATH.

Counties.	Diseases of the oesophagus			Ulcer of the stomach.			Other diseases of the stomach (cancer excepted.)			Diarrhea and enteritis (under two years)			Diarrhea and enteritis (two years and over)			Ankylostomiasis.			Intestinal parasites.			Appendicitis and typhlitis.			Hernia, intestinal obstruction.			Other diseases of the intestines.		
	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.
Adams	....	....	....	....	....	....	1	3	4	4	11	15	1	1	2	....	....	....	....	....	....	....	1	1	1	....	1	....	....	....
Ashland	....	....	....	....	1	1	1	....	1	11	9	20	2	3	5	....	....	....	....	....	....	3	7	10	1	4	5	....	....	....
Barron	....	1	1	....	....	....	6	2	8	9	13	22	1	2	3	....	....	....	....	....	....	5	4	9	3	3	6	....	1	1
Bayfield	....	....	....	....	....	....	1	3	4	3	7	10	1	1	2	....	....	....	....	....	....	1	....	1	....	....	....	....	3	3
Brown	....	....	....	5	3	8	10	11	21	27	49	76	....	3	3	....	....	....	1	....	1	12	18	30	7	7	14	1	3	4
Buffalo	....	....	....	1	2	3	5	....	5	2	7	9	2	....	2	....	....	....	....	....	....	....	1	1	....	1	1	....	....	....
Burnett	....	....	....	....	....	....	3	2	5	1	....	1	1	....	1	....	....	....	....	....	....	1	....	1	....	5	5	....	2	2
Calumet	....	....	....	2	1	3	1	....	1	7	5	12	....	2	2	....	....	....	....	....	....	3	2	5	3	3	6	....	....	....
Chippewa	....	....	....	1	2	3	5	3	8	12	11	23	2	3	5	....	....	....	....	....	....	11	10	21	3	1	4	1	1	2
Clark	....	....	....	2	....	2	4	5	9	14	15	29	1	4	5	....	....	....	....	....	....	1	2	3	1	1	2	....	....	....
Columbia	....	....	....	2	1	3	4	3	7	5	6	11	3	4	7	....	....	....	....	....	....	4	5	9	2	5	7	2	1	3
Crawford	....	....	....	1	1	2	3	2	5	9	6	15	....	1	1	....	....	....	....	....	....	2	6	8	1	3	4	....	....	....
Dane	....	....	....	1	3	4	16	23	39	9	15	24	6	8	14	....	....	....	....	....	....	7	9	16	10	10	20	7	5	12
Dodge	1	....	1	2	....	2	9	12	21	25	19	44	1	6	7	....	....	....	....	....	....	1	7	8	7	5	12	2	2	4
Door	1	....	1	2	1	3	4	3	7	5	4	9	1	1	2	....	....	....	....	....	....	2	3	5	2	....	2	....	2	2
Douglas	....	....	....	1	3	4	....	7	7	21	25	46	2	16	18	....	....	....	1	1	2	6	6	12	2	5	7	2	3	5
Dunn	1	....	1	2	1	3	6	3	9	5	7	12	2	....	2	....	....	....	1	1	2	4	2	6	3	1	4	....	....	....
Eau Claire	1	....	1	2	....	2	2	5	7	4	15	19	2	3	5	....	....	....	....	....	....	4	11	15	6	3	9	1	1	2
Florence	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Fond du Lac	1	....	1	3	4	7	10	8	18	16	14	30	4	7	11	....	....	....	....	....	....	6	12	18	11	10	21	4	8	12
Forest	....	....	....	....	1	1	....	....	....	5	3	8	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....
Grant	....	....	....	2	2	4	2	3	5	12	15	27	2	5	7	....	....	....	....	....	....	3	3	6	3	5	8	2	1	3
Green	....	....	....	....	....	....	10	6	16	3	8	11	4	7	11	....	....	....	....	....	....	1	1	2	4	2	6	....	....	....
Green Lake	....	....	....	....	1	1	2	....	2	1	4	5	....	1	1	....	....	....	....	....	....	2	1	3	2	1	3	....	....	....
Iowa	....	....	....	....	....	....	5	5	10	7	8	15	5	2	7	....	....	....	....	....	....	1	2	3	1	2	3	1	2	3
Iron	....	....	....	....	....	....	3	1	4	3	11	14	....	2	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Jackson	....	....	....	....	1	1	....	....	....	4	8	12	4	1	5	....	....	....	....	....	....	3	....	3	5	1	6	....	....	....
Jefferson	1	....	1	....	3	3	10	3	13	8	14	22	7	8	15	....	....	....	....	....	....	5	2	7	5	5	10	4	2	6
Juneau	....	....	....	1	....	1	2	2	4	7	7	14	2	2	4	....	....	....	....	....	....	4	2	6	1	2	3	....	1	1
Kenosha	....	....	....	1	....	1	6	9	15	51	26	77	6	3	9	....	....	....	....	....	....	6	2	8	1	3	4	1	....	1

Kewaunee	....	....	....	2	....	2	2	....	2	8	7	15	1	1	2	....	....	....	....	....	....	....	1	1	1	....	1	....	1	1
La Crosse	....	1	1	3	4	7	6	2	8	14	14	28	5	2	7	....	....	....	....	....	....	15	10	25	5	7	12	....	1	1
La Fayette	....	....	....	....	....	....	1	2	3	2	5	7	2	3	5	....	....	....	....	....	....	1	....	1	4	3	7	2	3	5
Langlade	....	....	....	1	1	2	1	2	3	4	7	11	1	....	1	....	....	....	....	....	....	2	2	4	1	....	1	1	4	5
Lincoln	....	....	....	1	....	1	....	2	2	8	8	16	1	1	2	....	....	....	....	....	....	....	1	1	3	1	4	1	....	1
Manitowoc	....	..	..	1	3	4	8	6	14	12	23	35	6	3	9	....	....	....	....	....	....	4	2	6	3	5	8	1	8	9
Marathon	....	....	....	2	....	2	6	6	12	17	35	52	5	4	9	....	....	....	....	....	....	3	6	9	8	4	12	1	....	1
Marinette	....	....	....	1	2	3	1	3	4	21	19	40	2	6	8	....	....	....	....	....	....	3	2	5	3	1	4	2	....	2
Marquette	....	....	....	....	....	....	....	1	1	2	4	6	....	1	1	....	....	....	....	....	....	3	2	5	4	1	5	....	1	1
Milwaukee	3	3	6	19	25	44	132	104	236	499	440	939	35	46	81	....	....	....	....	....	....	66	63	129	61	53	114	17	16	33
Monroe	....	....	....	2	1	3	3	4	7	9	2	11	3	1	4	....	....	....	....	....	....	4	4	8	1	4	5	....	....	....
Oconto	....	....	....	1	2	3	1	....	1	14	15	29	2	1	3	....	....	....	....	....	....	2	2	4	1	1	2	....	....	....
Oneida	....	....	....	....	....	....	1	1	2	1	4	5	1	1	2	....	....	....	....	....	....	1	....	1	1	....	1	....	1	1
Outagamie	....	....	....	1	2	3	3	3	6	16	15	31	2	9	11	....	....	....	....	....	....	4	12	16	5	8	13	....	1	1
Ozaukee	....	....	....	....	....	....	2	4	6	6	5	11	1	3	4	....	....	....	....	....	....	....	1	1	7	3	10	2	1	3
Pepin	....	....	....	2	....	2	2	....	2	2	2	4	....	1	1	....	....	....	....	....	....	1	....	1	1	1	2	....	....	....
Pierce	....	1	1	2	....	2	2	3	5	3	3	6	3	2	5	....	....	....	....	....	....	....	1	1	1	2	3	....	....	....
Polk	....	....	....	1	2	3	3	1	4	3	11	14	3	1	4	....	....	....	....	....	....	....	2	2	3	2	5	....	....	....
Portage	....	1	1	....	1	1	10	5	15	21	30	51	7	2	9	....	....	....	....	....	....	3	8	11	2	3	5	1	....	1
Price	....	....	....	....	....	....	2	2	4	3	1	4	2	2	4	....	....	....	....	....	....	....	....	....	1	1	2	....	....	....
Racine	1	....	1	....	1	1	13	14	27	37	29	66	5	8	13	....	....	....	....	....	....	7	8	15	3	4	7	4	2	6
Richland	....	1	1	1	....	1	4	5	9	7	3	10	1	3	4	....	....	....	....	....	....	....	....	....	4	3	7	....	....	....
Rock	....	....	....	4	3	7	12	10	22	19	11	30	3	3	6	....	....	....	1	....	1	6	8	14	6	10	16	1	8	9
Rusk	....	....	....	....	....	....	5	....	5	2	8	10	1	....	1	....	....	....	....	....	....	1	....	1	1	1	2	....	....	....
St. Croix	....	....	....	2	3	5	4	1	5	4	5	9	3	2	5	....	....	....	....	....	....	1	2	3	1	2	3	1	2	3
Sauk	....	....	....	....	1	1	5	8	13	3	8	11	2	1	3	....	....	....	....	....	....	2	2	4	2	4	6	....	2	2
Sawyer	....	....	....	....	....	....	1	....	1	5	8	13	....	....	....	....	....	....	....	....	....	....	1	1	1	....	1	....	....	....
Shawano	....	....	....	1	....	1	7	4	11	13	17	30	....	6	6	....	....	....	....	....	....	2	....	2	2	5	7	1	....	1
Sheboygan	....	....	....	4	4	8	1	7	8	26	28	54	1	....	1	....	....	....	....	....	....	10	12	22	5	4	9	3	1	4
Taylor	....	....	....	....	....	....	1	2	3	9	12	21	....	1	1	....	....	....	....	....	....	....	1	1	3	3	6	....	1	1
Trempealeau	....	....	....	....	1	1	1	2	3	1	9	10	1	....	1	....	....	....	....	....	....	1	2	3	3	....	3	2	....	2
Vernon	....	....	....	2	....	2	7	2	9	4	10	14	....	1	1	....	....	....	....	....	....	....	1	1	3	3	6	....	2	2
Vilas	....	....	....	....	....	....	....	....	....	1	4	5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Walworth	1	....	1	3	....	3	3	4	7	5	6	11	4	3	7	....	....	....	....	....	....	4	5	9	1	5	6	....	1	1
Washburn	....	....	....	....	....	....	....	....	....	1	5	6	2	....	2	....	....	....	....	....	....	....	....	....	1	1	2	1	....	1
Washington	....	....	....	1	1	2	3	3	6	5	1	6	1	....	1	....	....	....	....	....	....	....	1	1	5	4	9	....	2	2
Waukesha	....	....	....	1	5	6	4	4	8	14	11	25	7	5	12	....	....	....	....	....	....	3	3	6	4	3	7	....	1	1
Waupaca	....	....	....	....	....	....	5	4	9	4	8	12	6	4	10	....	....	....	....	....	....	3	2	5	1	6	7	....	1	1
Waushara	....	....	....	....	....	....	2	2	4	10	5	15	3	1	4	....	....	....	....	....	....	2	....	2	1	1	2	....	3	3
Winnebago	....	....	....	2	2	4	11	15	26	7	17	24	14	4	18	....	....	....	....	....	....	6	10	16	6	10	16	1	7	8
Wood	....	....	....	1	3	4	2	4	6	13	32	45	2	2	4	....	....	....	....	....	....	7	8	15	6	4	10	2	1	3
Total	11	8	19	92	98	190	408	366	774	1145	1229	3374	200	230	430	....	....	....	2	2	4	265	304	569	260	262	522	72	109	181

TABLE NO. 27.—Continued. SHOWING THE TOTAL DEATHS IN EACH COUNTY FROM JAN. 1, 1912, TO DEC. 31, 1913, ARRANGED ACCORDING TO THE CAUSES OF DEATH.

Counties.	Acute yellow atrophy of the liver.			Hydatid tumor of the liver.			Cirrhosis of the liver.			Biliary calculi.			Other diseases of the liver.			Diseases of the spleen.			Simple peritonitis (non-puerperal).			Other diseases of the digestive system.			Acute nephritis			Bright's disease.		
	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.
Adams	....	....	....	....	....	....	1	1	2	1	....	1	....	2	2	....	....	....	....	....	....	....	....	....	....	....	....	9	2	11
Ashland	....	....	....	....	....	....	2	3	5	....	1	1	1	6	7	....	....	....	3	1	4	....	....	....	2	2	4	11	8	19
Barron	....	....	....	....	....	....	1	....	1	....	2	2	1	3	4	....	1	1	....	1	1	....	....	....	1	1	2	12	9	21
Bayfield	....	....	....	....	....	....	....	....	....	....	....	....	2	1	3	....	....	....	1	....	1	....	1	1	....	....	....	2	3	5
Brown	....	....	....	....	....	....	2	10	12	2	....	2	6	8	14	....	....	....	2	3	5	....	....	....	7	2	9	37	30	67
Buffalo	....	....	....	....	....	....	1	1	2	....	....	....	....	1	1	....	....	....	....	2	2	....	....	....	1	3	4	4	2	6
Burnett	....	....	....	....	....	....	....	1	1	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	3	3	6
Calumet	1	....	1	....	....	....	2	1	3	1	2	3	1	....	1	....	....	....	....	1	1	....	....	....	....	....	....	12	12	24
Chippewa	....	....	....	....	....	....	5	1	6	....	2	2	....	3	3	....	....	....	3	2	5	....	1	1	1	2	3	15	10	25
Clark	....	....	....	....	....	....	5	2	7	1	....	1	1	1	2	....	....	....	1	1	2	....	....	....	2	2	4	14	13	27
Columbia	....	....	....	....	....	....	2	2	4	....	1	1	....	4	4	....	....	....	....	....	....	2	....	2	....	....	....	23	14	37
Crawford	....	....	....	....	....	....	2	1	3	1	....	1	1	1	2	....	....	....	....	4	4	....	....	....	1	1	2	8	8	16
Dane	2	....	2	....	....	....	3	14	17	5	2	7	9	2	11	1	....	1	3	4	7	2	....	2	7	10	17	45	38	83
Dodge	1	....	1	....	....	....	4	9	13	....	1	1	1	2	3	....	1	1	....	1	1	....	....	....	2	3	5	30	26	56
Door	....	....	....	....	....	....	2	1	3	2	....	2	1	1	2	1	....	1	1	....	1	....	1	1	2	1	3	9	14	23
Douglas	....	....	....	....	....	....	4	2	6	3	1	4	3	1	4	....	....	....	2	1	3	....	1	1	3	4	7	23	22	45
Dunn	....	....	....	....	....	....	1	4	5	1	1	2	3	....	3	....	....	....	....	....	....	....	....	....	3	....	3	10	3	13
Eau Claire	....	1	1	....	....	....	2	1	3	....	1	1	2	6	8	....	....	....	1	2	3	....	....	....	1	1	2	20	26	46
Florence	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2
Fond du Lac	1	....	1	....	....	....	5	5	10	4	3	7	2	5	7	....	....	....	3	....	3	....	1	1	8	4	12	35	22	57
Forest	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	1	1	....	....	....	1	....	1	4	....	4
Grant	....	1	1	....	....	....	4	10	14	....	....	....	2	3	5	....	....	....	....	....	....	....	....	....	3	1	4	22	15	37
Green	....	....	....	1	....	1	2	3	5	1	....	1	....	2	2	....	....	....	....	....	....	1	....	1	....	....	....	6	4	10
Green Lake	....	....	....	....	....	....	1	1	2	1	....	1	....	1	1	....	....	....	....	....	....	....	....	....	2	1	3	2	7	9
Iowa	....	....	....	....	....	....	1	1	2	....	3	3	3	....	3	....	....	....	1	....	1	....	....	....	2	1	3	11	10	21
Iron	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	1	....	1	....	4	4
Jackson	....	....	....	....	....	....	1	1	2	1	....	1	....	....	....	....	....	....	....	....	....	2	....	2	1	1	2	3	4	7
Jefferson	....	....	....	....	....	....	7	2	9	....	....	....	3	1	4	....	....	....	....	1	1	....	1	1	3	1	4	14	14	28
Juneau	....	....	....	....	....	....	....	1	1	....	1	1	3	7	10	....	....	....	....	....	....	....	....	....	2	....	2	9	15	24
Kenosha	....	....	....	....	....	....	5	2	7	....	1	1	4	....	4	....	....	....	1	1	2	1	....	1	5	5	10	21	18	39
Kewaunee	....	....	....	....	....	....	....	2	2	....	3	3	....	1	1	....	....	....	....	1	1	....	....	....	2	....	2	10	13	23

La Crosse	....	....	....	....	....	....	3	12	15	2	4	6	7	3	10	....	1	1	2	2	4	2	1	3	4	3	7	14	20	34
La Fayette	....	....	....	....	....	....	1	2	3	....	2	2	3	1	4	....	....	....	....	....	....	....	....	....	1	....	1	10	5	15
Langlade	....	....	....	....	....	....	....	1	1	....	....	....	1	....	1	....	....	....	1	1	2	....	....	....	1	....	1	7	5	12
Lincoln	....	....	....	....	....	....	1	....	1	....	....	....	1	....	1	....	....	....	2	....	2	....	....	....	2	....	2	7	4	11
Manitowoc	....	....	....	....	....	....	6	4	10	1	1	2	5	4	9	1	....	1	....	3	3	2	....	2	7	1	8	19	23	42
Marathon	....	....	....	....	....	....	6	1	7	....	....	....	1	1	2	1	....	1	2	2	4	2	1	3	6	3	9	29	27	56
Marinette	....	....	....	....	....	....	....	5	5	....	1	1	1	....	1	....	....	....	1	1	2	....	....	....	3	....	3	9	16	25
Marquette	....	....	....	....	....	....	1	1	2	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	3	9	12
Milwaukee	2	3	5	....	....	....	68	95	163	10	15	25	31	30	61	3	....	3	7	7	14	9	9	18	47	32	79	244	318	562
Monroe	....	....	....	....	....	....	2	2	4	1	1	2	1	....	1	....	....	....	1	1	2	....	....	....	....	2	2	12	10	22
Oconto	....	....	....	....	....	....	1	1	2	....	....	....	2	2	4	....	....	....	....	2	2	....	....	....	1	....	1	9	13	22
Oneida	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	1	....	1	1	2	3
Outagamie	....	....	....	....	....	....	3	8	11	....	2	2	3	4	7	....	....	....	....	2	2	....	....	....	4	1	5	18	22	40
Ozaukee	....	....	....	....	....	....	....	2	2	1	1	2	5	....	5	....	....	....	....	1	1	....	....	....	1	....	1	11	6	17
Pepin	....	....	....	....	....	....	....	1	1	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2	4	3	7
Pierce	1	....	1	....	....	....	....	3	3	....	....	....	2	1	3	....	....	....	2	....	2	....	1	1	1	1	2	12	9	21
Polk	....	....	....	....	....	....	1	2	3	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	1	1	2	15	15	30
Portage	....	....	....	....	....	....	6	7	13	1	....	1	1	3	4	....	....	....	3	3	6	....	....	....	3	1	4	9	14	23
Price	....	....	....	....	....	....	....	....	....	1	....	1	1	....	1	....	....	....	....	3	3	....	....	....	....	....	....	3	4	7
Racine	....	....	....	....	....	....	5	13	18	3	2	5	3	1	4	....	....	....	2	1	3	1	1	2	3	1	4	29	29	58
Richland	....	1	1	....	....	....	1	1	2	....	....	....	1	....	1	....	....	....	2	3	5	....	....	....	....	2	2	10	12	22
Rock	....	1	1	....	....	....	4	2	6	....	1	1	9	1	10	....	2	2	3	2	5	1	....	1	3	....	3	27	29	56
Rusk	....	....	....	....	....	....	....	....	....	....	....	....	1	2	3	....	....	....	1	....	1	....	....	....	3	....	3	6	5	11
St. Croix	1	....	1	....	....	....	1	4	5	....	....	....	1	....	1	....	....	....	1	1	2	....	....	....	1	1	2	20	10	30
Sauk	....	....	....	....	....	....	3	4	7	1	1	2	5	3	8	....	....	....	1	....	1	....	1	1	2	6	8	21	27	48
Sawyer	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Shawano	....	....	....	....	....	....	1	3	4	....	2	2	....	4	4	....	....	....	1	2	3	....	....	....	2	1	3	18	14	32
Sheboygan	....	....	....	....	....	....	8	3	11	4	3	7	7	3	10	1	....	1	....	2	2	2	1	3	1	2	3	28	24	52
Taylor	....	....	....	....	....	....	....	....	....	....	....	....	3	2	5	....	....	....	....	1	1	....	....	....	1	....	1	6	5	11
Trempealeau	....	....	....	....	....	....	....	1	1	....	....	....	....	1	1	....	....	....	1	....	1	....	....	....	1	1	2	8	6	14
Vernon	....	....	....	....	....	....	....	3	3	3	1	4	3	2	5	....	1	1	1	2	3	....	....	....	....	3	3	17	12	29
Vilas	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	2	2	4
Walworth	....	....	....	....	....	....	2	4	6	....	....	....	2	1	3	....	....	....	2	....	2	1	1	2	....	1	1	21	25	46
Washburn	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	1	....	1	7	5	12
Washington	....	....	....	....	....	....	5	4	9	....	....	....	3	....	3	....	....	....	....	1	1	....	....	....	....	1	1	18	16	34
Waukesha	....	....	....	....	....	....	3	....	3	....	1	1	1	1	2	....	....	....	1	1	2	....	1	1	2	1	3	19	25	44
Waupaca	....	....	....	....	....	....	4	9	13	....	....	....	....	2	2	....	....	....	....	2	2	....	....	....	1	1	2	29	30	59
Waushara	....	....	....	....	....	....	3	6	9	....	....	....	1	2	3	....	....	....	....	....	....	....	....	....	2	2	4	11	7	18
Winnebago	....	....	....	....	....	....	10	5	15	1	1	1	5	6	11	....	....	....	1	1	2	2	....	2	2	3	5	26	45	71
Wood	....	....	....	....	....	....	2	3	5	2	....	2	2	4	6	....	....	....	2	....	2	....	....	....	2	2	4	11	15	26
Total	9	7	16	1	....	1	217	294	511	55	66	121	164	148	312	8	6	14	64	74	138	30	23	53	175	121	296	1196	1237	2433

TABLE NO. 27.—Continued. SHOWING THE TOTAL DEATHS IN EACH COUNTY FROM JAN. 1, 1912, TO DEC. 31, 1913, ARRANGED ACCORDING TO THE CAUSES OF DEATH.

Counties.	Chyluria			Other diseases of the kidneys and annexa.			Calculi of the urinary passages.			Diseases of the bladder.			Diseases of the urethra, urinary abscess, etc.			Diseases of the prostate.			Nonvenereal diseases of the male genital organs.			Uterine haemorrhage (non-puerperal.)			Uterine tumor (non-cancerous.)			Other diseases of the uterus.		
	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.
Adams	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....
Ashland	....	....	....	1	....	1	1	....	1	1	2	3	....	....	....	2	1	3	....	....	....	....	....	....	....	....	....	....	1	1
Barron	....	....	....	....	....	....	....	....	....	1	2	3	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....
Bayfield	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Brown	....	....	....	1	2	3	....	....	....	2	4	6	....	....	....	3	....	2	....	....	....	....	....	....	....	2	2	2	2	4
Buffalo	....	....	....	2	....	2	....	....	....	....	1	1	....	....	....	1	2	3	....	....	....	....	....	....	....	....	....	....	....	....
Burnett	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	2	2	....	....	....	....	....	....	....	....	....	....	....	....
Calumet	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	4	....	4	....	....	....	....	....	....	....	....	....	....	2	2
Chippewa	....	....	....	....	4	4	....	....	....	1	2	3	....	....	....	2	1	3	....	....	....	....	....	....	....	....	....	....	1	2
Clark	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....
Columbia	....	....	....	....	1	1	....	....	....	5	2	7	....	....	....	6	3	9	....	....	....	....	....	....	....	....	....	....	....	....
Crawford	....	....	....	....	....	....	....	....	....	1	4	5	....	....	....	3	....	3	....	....	....	....	....	....	....	....	....	....	1	1
Dane	....	....	....	1	4	5	....	....	....	5	4	9	....	....	....	10	5	15	1	....	1	....	....	....	2	1	3	....	....	....
Dodge	....	....	....	1	1	2	1	....	1	1	2	3	....	....	....	1	2	3	....	1	1	....	....	....	....	....	....	....	....	....
Door	....	....	....	....	1	1	....	....	....	1	1	2	....	....	....	3	....	3	....	1	1	....	....	....	....	....	....	1	....	1
Douglas	....	....	....	....	1	1	....	....	....	2	1	3	....	....	....	1	....	1	....	....	....	....	....	....	1	....	1	....	2	2
Dunn	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	2	2	....	2	2	....	....	....	....	....	....	....	....	....
Eau Claire	....	....	....	1	1	2	1	....	1	....	1	1	....	....	....	4	2	6	....	....	....	....	1	1	....	1	1	1	2	3
Florence	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Fond du Lac	....	....	....	1	2	3	....	....	....	4	4	8	....	....	....	5	7	12	....	....	....	1	....	1	....	....	....	....	1	1
Forest	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Grant	....	....	....	2	....	2	....	....	....	1	1	2	....	....	....	2	....	2	....	....	....	....	....	....	....	....	....	....	....	....
Green	....	....	....	....	....	....	....	....	....	....	2	2	....	....	....	1	3	4	....	....	....	....	....	....	....	....	....	....	1	1
Green Lake	....	....	....	....	....	....	....	....	....	1	1	2	....	....	....	2	....	2	....	....	....	....	....	....	....	....	....	1	1	2
Iowa	....	....	....	1	1	2	....	....	....	1	....	1	....	....	....	1	....	1	....	....	....	1	....	1	....	....	....	....	....	....
Iron	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Jackson	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	3	....	....	....	....	....	....	....	....	....	1	....	1
Jefferson	....	....	....	1	1	2	1	....	1	4	3	7	....	....	....	4	3	7	....	....	....	....	....	....	....	2	2	1	....	1
Juneau	1	....	1	1	1	2	....	....	....	2	....	2	....	....	....	1	1	2	....	....	....	....	....	....	....	....	....	....	....	....
Kenosha	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	1	....	1

Kewaunee	....	....	....	....	....	....	....	....	....	2	....	2	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....
La Crosse	....	....	....	3	....	3	....	....	....	1	....	1	....	....	....	5	3	8	....	....	....	....	....	....	....	....	....	1	1
La Fayette	....	....	....	....	....	....	....	....	....	2	....	2	....	....	....	2	3	5	....	....	....	....	....	....	....	....	1	1	2
Langlade	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....
Lincoln	....	....	....	1	1	2	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	2	....	2	....	....	....	....	....
Manitowoc	....	....	....	1	1	2	....	....	....	....	1	1	....	....	....	4	1	5	....	....	....	....	....	....	1	1	....	1	1
Marathon	....	....	....	5	....	5	....	....	....	1	1	2	....	....	....	2	1	3	....	....	....	1	1	....	....	....	....	1	1
Marinette	....	....	....	....	....	....	....	....	....	1	1	2	....	....	....	1	1	2	....	....	....	....	....	....	....	....	....	1	1
Marquette	....	....	....	1	1	2	....	....	....	....	1	1	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....
Milwaukee	....	....	....	4	10	14	....	3	3	18	29	47	1	....	1	18	13	31	5	....	5	1	2	3	6	11	17	7	6	13
Monroe	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	3	....	3	....	....	....	....	....	....	....	....	....	1	1	2
Oconto	....	....	....	....	....	....	....	....	....	1	1	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Oneida	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Outagamie	....	....	....	4	2	6	....	....	....	....	2	2	....	....	....	2	2	4	....	....	....	....	....	....	1	2	3	2	1	3
Ozaukee	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....
Pepin	....	....	....	....	....	....	....	....	....	....	2	2	....	....	....	1	1	2	....	....	....	....	....	....	....	....	....	....	....	....
Pierce	....	....	....	....	1	1	....	....	....	2	2	4	....	....	....	4	1	5	....	....	....	....	....	....	....	....	....	1	....	1
Polk	....	....	....	1	2	3	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	1	....	1	....	....	....
Portage	....	....	....	1	2	3	....	....	....	1	....	1	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....
Price	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Racine	....	....	....	4	1	5	....	1	1	2	....	2	....	....	....	2	4	6	....	....	....	....	....	....	2	2	4	2	4	6
Richland	....	....	....	2	....	2	....	....	....	3	....	3	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....
Rock	....	....	....	1	....	1	....	....	....	4	3	7	....	....	....	8	7	15	....	....	....	....	....	....	....	2	2	....	2	2
Rusk	....	....	....	....	....	....	....	1	1	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
St. Croix	....	....	....	....	2	2	....	....	....	3	2	5	....	....	....	1	1	2	....	....	....	....	....	....	....	1	1	1	....	1
Sauk	....	....	....	1	....	1	....	....	....	....	1	1	....	....	....	3	1	4	....	1	1	....	....	....	....	....	....	....	....	....
Sawyer	....	....	....	....	1	1	....	....	....	....	1	1	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....
Shawano	....	....	....	1	1	2	....	1	1	2	3	5	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....
Sheboygan	....	....	....	2	2	4	....	....	....	2	4	6	....	....	....	4	2	6	....	....	....	....	....	....	1	....	1	....	1	1
Taylor	....	....	....	....	1	1	....	....	....	....	1	1	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....
Trempealeau	....	....	....	2	....	2	....	....	....	....	1	1	....	....	....	2	1	3	....	....	....	....	....	....	....	....	....	....	....	....
Vernon	....	....	....	....	....	....	1	....	1	....	1	1	....	....	....	3	....	3	....	....	....	....	....	....	....	....	....	....	....	....
Vilas	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Walworth	....	....	....	....	1	1	....	....	....	1	1	2	....	....	....	1	2	3	....	....	....	....	....	....	....	....	....	....	1	1
Washburn	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	1	....	1	....	....	....
Washington	....	....	....	....	....	....	....	....	....	3	2	5	....	....	....	1	1	2	....	....	....	....	....	....	1	....	1	....	....	....
Waukesha	....	1	1	2	1	3	1	....	1	1	3	4	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	3	3
Waupaca	....	....	....	....	4	4	....	....	....	2	2	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Waushara	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2	....	....	....	....	....	....	....	....	....	....	1	1
Winnebago	....	....	....	2	....	2	....	....	....	3	1	4	....	....	....	5	4	9	1	1	2	2	2	4	....	1	1	....	....	....
Wood	....	....	....	....	....	....	....	....	....	1	1	2	....	....	....	2	3	5	....	1	1	....	....	....	....	....	....	....	2	2
Total	1	1	2	53	55	108	6	6	12	90	108	198	1	....	1	44	91	235	7	9	16	5	4	9	19	27	46	23	42	65

TABLE NO. 27.—Continued. SHOWING THE TOTAL DEATHS IN EACH COUNTY FROM JAN. 1, 1912, TO DEC. 31, 1913, ARRANGED ACCORDING TO THE CAUSES OF DEATH.

Counties.	Cysts and other tumors of the ovary.			Salpingitis and other diseases of the female organs.			Nonpuerperal diseases of the breast.			Accidents of pregnancy.			Puerperal hemorrhage.			Other accidents of labor.			Puerperal septicaemia.			Puerperal albuminuria and convulsions.			Puerperal phlegmasia, alba dolens, sudden death.			Following childbirth (not otherwise defined.)		
	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.
Adams	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	1	....	1	1	....	1	1	1	2	....	....	....	1	....	1
Ashland	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	1	3	4	....	3	3	....	....	....	....	....	....
Barron	....	....	....	....	....	....	....	....	....	1	1	....	1	1	2	1	3	2	3	5	....	....	....	....	....	....	....	....	....	....
Bayfield	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	1	2	3	....	....	....	....	....	....	....	....	....
Brown	....	1	1	3	2	5	....	....	....	2	2	1	1	2	1	....	1	5	2	7	....	3	3	....	....	....	....	....	....	....
Buffalo	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....
Burnett	....	....	....	....	....	....	....	....	....	....	....	....	1	1	2	....	2	1	....	1	....	....	....	....	....	....	....	....	....	....
Calumet	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	2	2	....	....	....	....	....	....	....
Chippewa	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2	....	....	....	2	2	....	1	1	....	....	....	....	....	....	....
Clark	....	....	....	....	....	....	....	....	....	....	....	....	2	1	3	....	1	1	1	3	....	2	2	....	....	....	....	....	....	....
Columbia	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	3	4	....	....	....	....	....	....	....	....	....	....
Crawford	....	2	2	1	....	1	....	....	....	....	....	....	1	....	1	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....
Dane	....	2	2	1	1	2	....	1	1	1	3	4	1	1	2	1	....	1	2	1	3	1	3	4	....	....	....	....	....	....
Dodge	....	....	....	1	....	1	....	1	1	....	....	....	2	....	2	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....
Door	....	....	....	....	....	....	....	1	1	1	....	1	1	....	1	....	....	....	....	....	....	1	1	2	....	....	....	....	....	....
Douglas	1	....	1	1	....	1	....	....	....	1	1	2	1	....	1	1	2	3	1	2	3	....	....	....	....	....	....	....	....	....
Dunn	....	....	....	....	....	....	....	....	....	....	....	....	1	1	2	....	....	....	2	1	3	1	1	2	....	....	....	....	....	....
Eau Claire	1	1	2	....	1	1	....	....	....	1	....	1	2	1	3	....	1	1	....	4	4	....	1	1	....	....	....	....	1	1
Florence	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Fond du Lac	....	....	....	....	....	....	....	1	1	1	1	2	....	....	....	2	....	2	....	3	3	1	1	2	....	....	....	....	....	....
Forest	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Grant	1	1	2	....	....	....	....	....	....	....	....	....	....	1	1	2	1	3	1	....	1	4	....	4	....	....	....	....	....	....
Green	....	....	....	....	....	....	....	....	....	....	1	1	....	1	1	....	....	....	....	....	....	2	....	2	....	....	....	....	....	....
Green Lake	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2	....	....	....	....	....	....
Iowa	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	1	....	1	....	1	1	....	....	....	....	....	....
Iron	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....
Jackson	....	....	....	....	....	....	....	....	....	2	....	2	2	....	2	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....
Jefferson	....	1	1	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	1	1	2	....	2	2	....	....	....	....	....	....
Juneau	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	1	....	1	....	1	1	....	....	....	....	....	....	....	....	....
Kenosha	....	....	....	....	....	....	....	....	....	1	....	1	1	1	2	....	1	1	2	2	4	....	1	1	....	....	....	....	....	....

Kewaunee	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	2	2	....	....	....	....	....	....	....	1	....	1
La Crosse	....	1	1	3	1	4	....	....	....	....	....	....	1	....	1	1	1	2	1	3	4	1	1	2	....	....	....	....	1	1
La Fayette	1	1	2	....	....	....	....	....	....	....	....	....	....	1	1	....	1	1	....	....	....	....	1	1	....	....	....	....	....	....
Langlade	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	1	1	2	1	....	1	....	....	....	....	....	....
Lincoln	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	1	1	1	....	1	....	....	....	....	....	....
Manitowoc	1	....	1	....	....	....	....	....	1	1	2	1	....	1	....	....	....	....	1	2	3	....	....	....	....	....	....	....	....	....
Marathon	....	....	....	2	....	2	....	....	1	....	1	2	....	2	1	....	1	3	....	3	1	2	3	....	....	....	....	....	....	....
Marinette	1	....	1	....	....	....	....	....	1	....	1	1	....	1	1	1	2	4	....	4	1	....	1	....	....	....	....	....	....	....
Marquette	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Milwaukee	8	7	15	7	7	14	....	2	2	9	7	16	9	5	14	9	7	16	19	21	40	14	12	26	....	....	....	....	2	2
Monroe	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	1	1	1	....	1	....	....	....	....	....	....
Oconto	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	1	3	4	2	1	3	....	....	....	....	....	....
Oneida	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	3	1	4	....	....	....	....	....	....	....	....	....
Outagamie	....	2	2	....	1	1	....	....	....	....	....	....	....	1	1	....	1	1	1	2	3	....	3	3	....	....	....	....	1	1
Ozaukee	....	1	1	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Pepin	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	1	....	1	....	....	....	....	....	....	....	....	....
Pierce	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	1	1	2	....	2	....	....	....	....	....	....	....	....	....
Polk	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	1	1	2	....	....	....	....	....	....	....	....	....
Portage	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	1	1	....	1	1	....	1	1	....	1	1	....	....	....
Price	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	1	1	2	....	....	....	....	....	....	....	....	....	....	....	....
Racine	1	2	3	....	1	1	1	....	1	1	1	2	....	....	....	1	....	1	2	3	5	1	....	1	....	....	....	1	....	1
Richland	....	....	....	....	....	....	....	....	....	....	....	....	1	1	2	....	....	....	2	....	2	....	....	....	....	....	....	....	....	....
Rock	1	1	2	2	....	2	....	....	....	2	1	3	....	1	1	....	1	1	1	3	4	1	....	1	....	....	....	....	....	....
Rusk	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	1	....	1	....	....	....	....	....	....
St. Croix	....	....	....	....	....	....	....	....	....	1	3	4	....	....	....	....	....	....	1	1	2	1	3	4	....	....	....	....	....	....
Sauk	....	1	1	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	1	1	....	1	1	....	....	....	....	....	....
Sawyer	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	4	....	1	1	....	....	....	....	....	....	....	....	....
Shawano	....	....	....	....	....	....	....	....	....	....	....	....	3	....	3	1	1	2	1	3	4	1	....	1	1	....	1	....	....	....
Sheboygan	....	2	2	....	....	....	....	....	....	1	....	1	....	2	2	....	....	....	1	1	2	1	2	3	....	....	....	....	1	1
Taylor	....	....	....	....	....	....	....	....	....	1	....	1	1	2	3	1	....	1	1	2	3	....	1	1	....	....	....	....	....	....
Trempealeau	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....
Vernon	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	1	....	1	....	2	2	....	....	....	....	....	....
Vilas	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	1	1	....	....	....	....	....	....	....	....	....
Walworth	....	....	....	1	1	2	....	....	....	....	....	....	....	....	....	1	1	2	1	1	2	....	....	....	....	....	....	....	....	....
Washburn	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Washington	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	1	1	....	....	....	....	1	1
Waukesha	....	....	....	....	....	....	1	....	1	1	....	1	....	....	....	1	....	1	....	....	....	....	2	2	....	....	....	....	....	....
Waupaca	....	1	1	....	1	1	....	....	....	1	....	1	1	....	1	1	1	2	1	1	2	1	....	1	....	....	....	....	....	....
Waushara	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....
Winnebago	....	1	1	1	4	5	....	....	....	....	2	2	....	....	....	1	2	3	....	3	3	....	1	1	....	....	....	....	....	....
Wood	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	1	1	2	....	1	1	....	....	....	....	....	....
Total	16	29	45	23	21	44	3	6	9	31	28	59	40	32	72	42	33	75	77	96	173	43	58	101	1	1	2	3	7	10

TABLE NO. 27.—Continued. SHOWING THE TOTAL DEATHS IN EACH COUNTY FROM JAN. 1, 1912, TO DEC. 31, 1913, ARRANGED ACCORDING TO THE CAUSES OF DEATH.

Counties.	Puerperal diseases of breast.			Gangrene			Furuncle.			Acute abscess.			Other diseases of the skin and annexa.			Diseases of the bones (tuberculosis excepted.)			Diseases of the joints.			Amputations.			Other diseases of the organs of locomotion.			Congenital malformations.		
	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.
Adams	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	1	2	3
Ashland	....	....	....	1	1	2	....	1	1	....	2	2	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	4	....	4
Barron	....	....	....	1	2	3	....	....	....	....	....	....	....	....	....	1	1	2	....	....	....	....	....	....	....	....	....	3	2	5
Bayfield	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1
Brown	....	....	....	2	....	2	2	....	2	....	1	1	1	....	1	....	3	3	....	....	....	....	....	....	....	....	....	13	9	22
Buffalo	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	2	....	2
Burnett	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	2
Calumet	....	....	....	....	1	1	....	....	....	....	1	1	1	....	1	....	1	1	....	....	....	....	....	....	....	....	2	3	5
Chippewa	....	....	....	1	1	2	....	....	....	....	....	....	1	....	1	....	....	....	1	....	1	....	....	....	....	....	....	....	2	2
Clark	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	5	7
Columbia	....	....	....	2	....	2	....	1	1	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	1	3	4
Crawford	....	....	....	3	1	4	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	1	1	....	....	....	1	....	1
Dane	....	....	....	2	7	9	1	....	1	....	....	....	2	1	3	....	2	2	....	....	....	....	....	....	....	....	9	7	16
Dodge	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	4	9	13
Door	....	....	....	....	1	1	....	....	....	....	....	....	....	2	2	....	....	....	....	....	....	....	....	....	....	....	....	1	1
Douglas	....	....	....	....	....	....	1	....	1	....	1	1	....	1	1	3	....	3	....	....	....	....	....	....	....	....	5	7	12
Dunn	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2
Eau Claire	....	....	....	....	1	1	....	....	....	2	....	2	....	....	....	1	1	2	....	....	....	....	....	....	1	....	1	3	4
Florence	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	2	3
Fond du Lac	....	....	....	....	....	....	....	....	....	....	2	2	1	....	1	....	1	1	....	....	....	....	....	....	....	....	7	7	14
Forest	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	1	1
Grant	....	....	....	....	3	3	....	1	1	1	....	1	1	....	1	....	1	1	....	....	....	....	....	....	....	....	7	1	8
Green	....	....	....	....	2	2	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	1	....	1	1	1	2
Green Lake	....	....	....	....	1	1	....	....	....	....	....	....	1	....	1	....	1	1	....	....	....	....	....	....	....	....	....	1	3	4
Iowa	....	....	....	1	3	4	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	3	3	6
Iron	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	2	5
Jackson	....	....	....	1	....	1	1	....	1	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	4	....	4
Jefferson	....	....	....	2	2	4	....	....	....	....	....	....	....	1	1	1	....	1	....	....	....	....	....	....	....	....	....	1	1
Juneau	....	....	....	1	....	1	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	2
Kenosha	....	....	....	1	1	2	....	....	....	1	....	1	1	3	4	....	4	4	....	....	....	....	....	....	....	....	6	7	13
Kewaunee	....	....	....	1	1	2	....	....	....	....	....	....	....	....	....	2	....	2	....	....	....	....	....	....	....	....	2	1	3

La Crosse	....	....	....	2	4	6	1	....	1	....	1	1	1	1	2	1	6	7	....	....	....	....	....	....	....	....	....	2	4	6
La Fayette	....	....	....	1	2	3	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	3	5	8
Langlade	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	2	2
Lincoln	....	....	....	....	1	1	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	2	5
Manitowoc	....	....	....	1	1	2	....	....	....	....	....	....	1	....	1	....	....	....	....	1	1	....	1	1	....	....	....	8	4	12
Marathon	....	....	....	1	1	2	....	....	....	2	1	3	....	3	3	....	....	....	....	1	1	....	....	....	....	....	....	5	7	12
Marinette	....	....	....	....	1	1	....	....	....	....	1	1	....	....	....	1	....	1	....	....	....	....	1	1	....	....	....	....	4	7	11
Marquette	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	1	....	1
Milwaukee	....	....	....	15	6	21	3	2	5	3	6	9	7	14	21	17	8	25	....	1	1	....	....	....	2	....	2	47	71	118
Monroe	....	....	....	1	....	1	....	....	....	....	1	1	....	....	....	....	2	2	....	....	....	....	....	....	....	....	....	2	4	6
Oconto	....	....	....	1	1	2	....	....	....	1	....	1	1	....	1	3	....	3	....	....	....	....	....	....	1	....	1	2	3	5
Oneida	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1
Outagamie	....	....	....	2	5	7	....	....	....	....	1	1	1	....	1	2	....	2	....	....	....	....	....	....	....	....	....	8	10	18
Ozaukee	....	....	....	....	1	1	1	....	1	....	....	....	1	....	1	....	1	1	....	....	....	....	....	....	....	....	....	....	1	1
Pepin	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	1	1	2
Pierce	....	....	....	2	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	5	3	8
Polk	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	1	....	1	....	....	....	4	5	9
Portage	....	....	....	1	4	5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	5	3	8
Price	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5	2	7
Racine	....	....	....	1	2	3	....	2	2	....	....	....	....	....	....	2	1	3	....	....	....	....	....	....	....	....	....	7	2	9
Richland	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	3
Rock	....	....	....	3	....	3	....	....	....	....	....	....	1	1	2	....	1	1	....	....	....	....	....	....	....	....	....	6	6	12
Rusk	....	....	....	....	....	....	1	....	1	1	....	1	....	1	1	1	....	1	....	....	....	....	....	....	....	....	....	1	3	4
St. Croix	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	4
Sauk	....	....	....	2	....	2	1	....	1	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	1	3	4
Sawyer	....	....	....	....	....	....	....	....	....	....	2	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1
Shawano	....	....	....	....	1	1	....	....	....	....	....	....	....	1	1	1	1	2	....	1	1	....	....	....	....	....	....	4	5	9
Sheboygan	....	....	....	3	3	6	....	....	....	....	1	1	....	....	....	....	1	1	1	....	1	....	....	....	....	....	....	9	7	16
Taylor	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	2	....	....	....	....	....	....	....	....	....	2	2	4
Trempealeau	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	2	....	2
Vernon	....	....	....	3	....	3	....	....	....	....	1	1	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	6	5	11
Vilas	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Walworth	....	....	....	4	2	6	1	....	1	....	....	....	....	....	....	2	....	2	....	....	....	....	1	1	....	....	....	4	5	9
Washburn	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1
Washington	....	....	....	....	2	2	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	1	4	5
Waukesha	....	....	....	1	....	1	....	....	....	....	1	1	....	....	....	....	2	2	....	....	....	....	....	....	....	....	....	5	2	7
Waupaca	....	....	....	3	1	4	....	....	....	1	1	2	2	....	2	....	....	....	....	....	....	....	....	....	....	....	....	1	4	5
Waushara	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	9	4	13
Winnebago	....	....	....	....	2	2	....	....	....	....	1	1	....	1	1	2	1	3	....	....	....	....	1	1	....	....	....	8	6	14
Wood	....	....	....	....	....	....	....	....	....	....	2	2	1	....	1	1	3	4	....	....	....	....	....	....	1	....	1	1	2	3
Total	....	....	....	71	71	142	13	8	21	14	27	41	28	32	60	51	49	100	2	5	7	2	5	7	7	....	7	261	287	548

TABLE NO. 27—Continued. SHOWING THE TOTAL DEATHS IN EACH COUNTY FROM JAN. 1, 1912, TO DEC. 31, 1913, ARRANGED ACCORDING TO THE CAUSES OF DEATH.

Counties.	Congenital debility, icterus sclerema.			Other causes peculiar to infancy.			Lack of care.			Senility.			Suicide by poison.			Suicide by asphyxia.			Suicide by hanging or strangulation.			Suicide by drowning.			Suicide by firearms.			Suicide by cutting or piercing instruments.		
	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.
Adams	6	11	17	1	1	2	....	....	....	11	2	13	....	1	1	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....
Ashland	26	13	39	6	3	9	....	....	....	4	4	8	....	....	....	....	....	....	1	1	2	....	....	....	1	3	4	2	....	2
Barron	24	22	46	2	4	6	....	....	....	21	5	26	....	....	....	....	....	....	2	....	2	....	1	1	....	2	2	....	....	....
Bayfield	7	12	19	3	....	3	....	....	....	6	6	12	....	....	....	....	....	....	....	....	....	....	....	....	1	2	3	....	....	....
Brown	80	69	149	10	21	31	1	....	1	41	36	77	....	2	2	....	....	....	....	1	1	....	....	....	2	1	3	....	....	....
Buffalo	7	13	20	1	....	1	....	....	....	9	12	21	....	....	....	....	....	....	....	2	2	....	....	....	3	....	3	....	....	....
Burnett	11	9	20	1	....	1	....	....	....	2	7	9	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Calumet	7	10	17	3	3	6	....	....	....	5	7	12	1	....	1	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....
Chippewa	16	22	38	3	7	10	....	....	....	19	19	38	1	....	1	....	....	....	....	1	1	....	....	....	....	4	4	....	1	1
Clark	16	15	31	5	7	12	....	....	....	9	12	21	....	....	....	....	....	....	....	....	....	....	1	1	1	2	3	....	....	....
Columbia	10	16	26	4	8	12	....	....	....	28	27	55	1	1	2	....	....	....	4	2	6	1	....	1	1	....	1	....	....	....
Crawford	10	10	20	2	8	10	....	....	....	5	11	16	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....
Dane	36	33	69	6	16	22	1	....	1	45	44	89	3	2	5	....	2	2	2	....	2	1	1	2	3	5	8	1	....	1
Dodge	29	34	63	8	9	17	....	....	....	27	24	51	1	....	1	....	....	....	....	1	1	....	....	....	2	1	3	2	....	2
Door	11	8	19	3	5	8	....	....	....	6	13	19	1	....	1	....	....	....	....	1	1	....	....	....	3	1	4	....	....	....
Douglas	36	32	68	9	12	21	....	....	....	10	23	33	1	....	1	....	....	....	1	....	1	1	....	1	5	3	8	....	....	....
Dunn	7	13	20	9	7	16	....	....	....	14	14	28	....	....	....	....	....	....	1	1	2	....	....	....	....	2	2	....	....	....
Eau Claire	14	21	35	1	5	6	....	....	....	14	19	33	1	1	2	....	....	....	....	1	1	....	....	....	....	1	1	....	....	....
Florence	2	....	2	....	2	2	....	....	....	1	3	4	....	....	....	....	....	....	1	....	1	....	....	....	....	1	1	....	....	....
Fond du Lac	40	32	72	10	10	20	....	....	....	40	35	75	1	....	1	....	1	1	2	5	7	....	....	....	4	1	5	....	2	2
Forest	6	7	13	5	1	6	....	....	....	1	2	3	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....
Grant	21	15	36	6	5	11	....	....	....	24	33	57	1	2	3	....	....	....	....	....	....	....	....	....	4	....	4	....	....	....
Green	9	11	20	2	2	4	....	....	....	13	16	29	4	1	5	....	....	....	2	....	2	....	....	....	1	1	2	1	....	1
Green Lake	10	7	17	1	4	5	....	....	....	12	17	29	1	....	1	....	....	....	1	2	3	....	....	....	....	1	1	....	....	....
Iowa	10	9	19	1	4	5	....	....	....	18	16	34	1	....	1	....	....	....	1	1	2	....	....	....	....	1	1	....	....	....
Iron	7	6	13	5	6	11	....	....	....	....	6	6	....	....	....	1	....	1	....	1	1	....	....	....	....	....	....	....	....	....
Jackson	15	11	26	2	1	3	....	....	....	11	12	23	1	....	1	....	....	....	1	....	1	....	....	....	....	1	1	....	....	....
Jefferson	17	15	32	5	2	7	....	....	....	16	21	37	1	2	3	....	....	....	2	3	5	....	....	....	1	1	2	....	2	2
Juneau	8	9	17	2	2	4	....	....	....	19	28	47	....	1	1	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....
Kenosha	23	23	46	7	5	12	....	....	....	16	14	30	1	1	2	....	....	....	1	....	1	....	3	3	....	3	3	....	1	1
Kewaunee	10	15	25	8	4	12	....	....	....	17	24	41	....	....	....	....	....	....	....	2	2	....	....	....	....	....	....	....	....	....

La Crosse	26	34	60	7	8	15	....	....	....	25	34	59	1	3	4	....	3	3	1	1	2	....	....	....	4	....	4	....	....	....
La Fayette	13	8	21	5	2	7	....	....	....	17	12	29	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....
Langlade	12	21	33	7	2	9	....	....	....	12	9	21	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	1	....	1
Lincoln	12	16	28	4	4	8	....	....	....	11	6	17	....	....	....	....	....	....	....	2	2	2	1	3	1	....	1	....	....	....
Manitowoc	31	29	60	14	11	25	....	....	....	37	31	68	1	2	3	....	....	....	1	2	3	1	2	3	1	1	2	....	1	1
Marathon	26	44	70	14	12	26	3	....	3	20	26	46	1	1	2	....	....	....	2	....	2	....	....	....	3	2	5	....	....	....
Marinette	27	23	50	4	4	8	....	....	....	21	23	44	....	1	1	....	....	....	....	1	1	....	....	....	1	....	1	....	1	1
Marquette	5	7	12	1	2	3	....	....	....	7	13	20	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....
Milwaukee	387	503	890	95	135	230	....	....	....	166	152	318	33	43	76	....	7	7	13	13	26	7	6	13	23	20	43	2	10	12
Monroe	9	19	28	2	6	8	....	....	....	14	8	22	....	1	1	....	....	....	1	1	2	....	....	....	1	....	1	....	2	2
Oconto	20	23	43	4	4	8	....	....	....	15	21	36	....	....	....	....	....	....	....	1	1	....	1	1	1	....	1	....	....	....
Oneida	4	11	15	3	3	6	....	....	....	3	1	4	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....
Outagamie	20	33	53	8	13	21	....	....	....	49	38	87	2	1	3	....	....	....	....	....	....	....	....	....	2	....	2	1	1	2
Ozaukee	14	11	25	1	2	3	....	....	....	19	17	36	....	....	....	....	....	....	1	2	3	....	1	1	....	....	....	....	....	....
Pepin	2	1	3	1	3	4	....	....	....	3	4	7	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Pierce	9	6	15	1	4	5	....	....	....	14	16	30	....	1	1	....	....	....	....	....	....	....	....	....	3	1	4	....	....	....
Polk	12	9	21	4	8	12	....	....	....	5	3	8	1	....	1	....	....	....	....	1	1	....	....	....	1	2	3	....	1	1
Portage	30	29	59	7	7	14	....	....	....	22	20	42	1	....	1	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....
Price	4	6	10	3	9	12	....	....	....	3	3	6	....	1	1	....	....	....	1	....	1	....	....	....	2	1	3	....	....	....
Racine	29	39	68	11	15	26	....	....	....	44	42	82	3	2	5	....	....	....	3	3	6	1	2	3	1	1	2	1	1	2
Richland	17	15	32	3	4	7	....	....	....	6	3	9	2	....	2	....	....	....	....	2	2	....	....	....	1	....	1	....	....	....
Rock	44	33	77	7	9	16	....	....	....	53	57	110	....	....	....	....	....	....	2	....	2	1	....	1	7	2	9	2	1	3
Rusk	9	11	20	3	3	6	....	....	....	2	4	6	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
St. Croix	21	19	40	2	8	10	....	1	1	8	22	30	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2	2	....	2
Sauk	12	17	29	3	5	8	....	....	....	25	28	53	....	....	....	....	....	....	2	....	2	1	....	1	1	1	2	....	....	....
Sawyer	4	2	6	3	1	4	....	....	....	....	3	3	1	....	1	....	....	....	....	....	....	....	....	....	1	....	1	1	....	1
Shawano	23	17	40	12	8	20	....	....	....	18	25	43	3	2	5	....	....	....	....	....	....	....	....	....	1	1	2	....	1	1
Sheboygan	41	41	82	9	14	23	....	....	....	37	45	82	4	3	7	....	....	....	4	5	9	....	1	1	5	....	5	....	....	....
Taylor	5	11	16	2	2	4	....	....	....	4	8	12	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....
Trempealeau	5	16	21	4	6	10	....	....	....	22	17	39	....	....	....	....	....	....	1	2	3	1	....	1	....	2	2	....	....	....
Vernon	12	11	23	7	9	16	....	....	....	15	17	32	1	....	1	....	....	....	....	....	....	....	....	....	4	....	4	....	....	....
Vilas	8	5	13	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....
Walworth	11	10	21	3	3	6	....	....	....	34	34	68	1	....	1	....	....	....	2	2	4	....	2	2	1	1	2	....	1	1
Washburn	6	11	17	2	5	7	....	....	....	4	2	6	....	....	....	....	....	....	....	....	....	....	....	....	1	2	3	....	....	....
Washington	17	9	26	3	9	12	....	....	....	16	19	35	....	1	1	....	....	....	1	....	1	....	....	....	4	....	4	1	....	1
Waukesha	22	13	35	2	5	7	....	....	....	44	25	69	1	2	3	....	1	1	4	10	14	....	1	1	1	1	2	....	....	....
Waupaca	19	16	35	4	6	10	....	....	....	30	30	60	....	....	....	....	....	....	....	....	....	....	....	....	3	....	3	....	....	....
Waushara	11	14	25	2	8	10	....	....	....	11	15	26	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....
Winnebago	50	48	98	9	7	16	....	2	2	47	40	87	1	3	4	....	....	....	1	....	1	....	1	1	....	3	3	....	....	....
Wood	22	22	44	3	10	13	....	....	....	15	17	32	3	2	5	....	....	....	....	....	....	....	....	....	1	1	2	1	....	1
Total	1582	1736	3318	410	540	950	5	3	8	1362	1403	2765	82	83	165	1	14	15	62	76	138	17	25	42	113	84	197	18	26	44

TABLE NO. 27.—Continued. SHOWING THE TOTAL DEATHS IN EACH COUNTY FROM JAN. 1, 1912, TO DEC. 31, 1913, ARRANGED ACCORDING TO THE CAUSES OF DEATH.

Counties.	Suicide by jumping from high places.			Suicide by crushing.			Other suicides.			Poisoning by food.			Other acute poisonings.			Conflagration.			Burns, (conflagration excepted.)			Absorption of deleterious gases.			Accidental drowning.			Traumatism by firearms.		
	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.
Adams	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....
Ashland	....	....	....	....	....	....	....	....	....	....	2	2	3	1	4	....	....	....	2	2	4	....	....	....	6	6	12	3	2	5
Barron	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	1	3	....	....	....	....	3	3	....	2	2
Bayfield	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2	....	....	....	5	1	6	2	....	2
Brown	....	....	....	....	....	....	....	....	....	3	....	3	....	....	....	....	....	....	1	4	5	....	....	....	10	4	14	1	1	2
Buffalo	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	1	1	....	....	....	2	....	2	1	1	2
Burnett	....	....	....	....	....	....	....	....	....	....	1	1	1	....	1	....	....	....	2	....	2	....	....	....	2	4	6	....	....	....
Calumet	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	2	3	1	....	1
Chippewa	....	....	....	....	....	....	....	....	....	2	1	3	2	....	2	....	....	....	1	3	4	....	....	....	3	5	8	2	....	2
Clark	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	1	5	6	....	1	1	....	1	1	1	2	3
Columbia	....	....	....	....	....	....	....	....	....	....	1	1	....	1	1	....	....	....	1	....	1	....	....	....	4	5	9	....	1	1
Crawford	....	....	....	....	....	....	1	....	1	....	....	....	1	....	1	....	....	....	1	1	2	....	....	....	1	1	2	2	1	3
Dane	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	4	8	12	3	3	6	2	5	7	1	2	3
Dodge	....	....	....	1	....	1	....	....	....	....	....	....	....	2	2	....	....	....	5	....	5	2	2	4	5	1	6	3	1	4
Door	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	1	....	1	2	....	2	....	....	....	3	2	5	1	....	1
Douglas	....	....	....	....	....	....	....	1	1	2	....	2	2	1	3	....	....	....	2	3	5	2	1	3	10	15	25	5	5	10
Dunn	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	2	2	....	....	....	....	4	4	....	....	....
Eau Claire	....	....	....	....	....	....	1	....	1	....	1	1	....	....	....	....	....	....	....	3	3	....	....	....	3	5	8	....	1	1
Florence	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2	1	....	1
Fond du Lac	....	....	....	....	....	....	....	....	....	1	....	1	3	....	3	3	....	3	3	1	4	....	....	....	2	6	8	4	2	6
Forest	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	1	1	....	....	....	....	....	....	3	....	3
Grant	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	4	6	10	....	....	....
Green	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	2	3	1	1	2
Green Lake	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	1	....	1	....	....	....	....	....	....	....	1	1	....	....	....
Iowa	....	....	....	....	....	....	....	....	....	....	....	....	1	1	2	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....
Iron	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1
Jackson	....	....	....	....	....	....	....	1	1	....	....	....	2	....	2	....	....	....	....	2	2	....	....	....	3	1	4	1	....	1
Jefferson	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	1	....	1	1	....	1	1	....	1	5	5	10	1	1	2
Juneau	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	1	4	5	....	....	....	1	1	2	1	....	1
Kenosha	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2	3	4	7	1	....	1	2	5	7	2	2	4
Kewaunee	....	....	....	....	....	....	....	1	1	....	....	....	....	1	1	....	....	....	1	1	2	....	....	....	....	2	2	....	....	....

La Crosse	....	....	....	....	....	....	....	....	....	....	2	2	....	....	....	....	....	....	3	....	3	1	....	1	8	7	15	....	2	2
La Fayette	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	1	....	1	3	1	4	4	....	4	2	....	2	....	....	....
Langlade	....	....	....	....	....	....	1	....	1	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	1	3	4	4	....	4
Lincoln	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	2	2	....	....	....	3	3	6	1	1	2
Manitowoc	....	....	....	....	....	....	....	....	....	....	2	2	....	....	....	....	....	....	....	1	1	....	....	....	6	12	18	3	....	3
Marathon	....	....	....	....	....	....	....	....	....	....	....	....	1	1	2	....	....	....	7	4	11	....	....	....	8	12	20	1	4	5
Marinette	....	....	....	....	....	....	1	....	1	....	....	....	2	....	2	....	....	....	2	1	3	....	....	....	6	6	12	1	1	2
Marquette	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Milwaukee	1	1	2	1	2	3	....	....	....	9	3	12	7	7	14	1	9	10	23	28	51	22	4	26	42	51	93	3	4	7
Monroe	....	....	....	....	....	....	....	....	....	....	1	1	2	1	3	1	....	1	....	....	....	....	....	....	2	1	3	1	1	2
Oconto	....	....	....	....	....	....	....	1	1	....	3	3	....	....	....	....	....	....	1	3	4	....	....	....	3	1	4	2	1	3
Oneida	....	....	....	....	....	....	....	....	....	1	....	1	....	1	1	....	....	....	....	1	1	....	....	....	3	1	4	1	....	1
Outagamie	....	....	....	....	....	....	....	....	....	....	1	1	2	2	4	....	....	....	2	....	2	1	....	1	9	9	18	2	....	2
Ozaukee	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	1	1	....	....	....	....	2	2	....	....	....
Pepin	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	1	4	5	....	1	1
Pierce	....	....	....	....	....	....	1	....	1	1	1	2	....	....	....	1	....	1	2	....	2	....	....	....	1	2	3	....	1	1
Polk	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	1	....	1	....	....	....	2	2	4	....	....	....
Portage	....	....	....	....	....	....	....	....	....	1	....	1	1	1	2	....	....	....	4	2	6	....	....	....	....	6	6	....	....	....
Price	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6	....	6	....	....	....	....	....	....	3	1	4	2	1	3
Racine	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2	....	1	1	4	2	6	....	4	4	8	11	19	1	2	3
Richland	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2	1	....	1	3	....	3	....	....	....	1	1	2	....	1	1
Rock	....	....	....	....	....	....	....	....	....	2	1	3	4	1	5	....	....	....	4	6	10	1	1	2	9	4	13	3	2	5
Rusk	....	....	....	....	....	....	....	1	1	....	....	....	3	....	3	....	....	....	2	....	2	4	....	4	4	1	5	1	....	1
St. Croix	....	....	....	....	....	....	....	....	....	....	1	1	....	1	1	....	1	1	2	....	2	1	....	1	8	2	10	....	1	1
Sauk	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	3	3	6	....	....	....	2	2	4	1	1	2
Sawyer	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2	....	....	....	....	1	1	....	....	....	2	2	4	1	1	2
Shawano	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	3	3	6	1	....	1	....	....	....	7	4	11	1	2	3
Sheboygan	....	....	....	....	....	....	1	....	1	....	1	1	1	....	1	....	1	1	1	1	2	3	....	3	10	4	14	1	2	3
Taylor	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	5	3	8	1	2	3
Trempealeau	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	2	....	1	1
Vernon	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	3	3	1	....	1	3	1	4	1	....	1
Vilas	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2	....	....	....	1	2	3	1	....	1
Walworth	....	....	....	....	....	....	....	....	....	1	....	1	2	1	3	1	....	1	2	1	3	....	....	....	12	10	22	....	1	1
Washburn	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2	....	....	....	....	....	....	1	1	2	....	2	2
Washington	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	1	1	2	....	....	....	3	2	5	....	....	....
Waukesha	....	1	1	....	....	....	....	....	....	2	1	3	1	1	2	....	....	....	1	4	5	....	1	1	9	10	19	1	1	2
Waupaca	....	....	....	1	....	1	2	....	2	1	1	2	....	1	1	....	2	2	1	2	3	2	....	2	2	5	7	2	....	2
Waushara	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	3	4	1	1	2
Winnebago	....	....	....	....	....	....	....	....	....	....	....	....	1	3	4	....	1	1	5	2	7	....	1	1	10	3	13	3	3	6
Wood	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	1	2	3	....	....	....	4	5	9	2	1	3
Total	1	2	3	3	2	5	9	5	14	27	30	57	56	31	87	27	18	45	117	119	236	50	18	68	280	294	574	79	67	146

TABLE NO. 27.—Continued. SHOWING THE TOTAL DEATHS IN EACH COUNTY FROM JAN. 1, 1912, TO DEC. 31, 1913, ARRANGED ACCORDING TO THE CAUSES OF DEATH.

Counties.	Traumatism by cutting or piercing instrum'nts			Traumatism by fall.			Traumatism in mines and quarries.			Traumatism by machines.			Traumatism by other crushing.			Injuries by animals.			Starvation.			Excessive cold.			Effects of heat.			Lightning.		
	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.
Adams	....	....	....	....	1	1	....	....	....	....	....	....	1	....	1	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....
Ashland	1	....	1	2	4	6	1	2	3	....	3	3	4	12	16	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....
Barron	....	....	....	....	1	1	....	....	....	3	1	4	3	1	4	1	1	2	....	....	....	....	....	....	....	1	1	....	1	1
Bayfield	....	....	....	2	1	3	....	....	....	1	....	1	6	4	10	....	1	1	....	....	....	1	....	1	....	....	....	....	....	....
Brown	....	....	....	3	3	6	....	....	....	....	....	....	12	10	22	....	1	1	....	....	....	1	....	1	....	....	....	....	2	2
Buffalo	....	....	....	1	....	1	....	....	....	....	....	....	1	1	2	1	....	1	....	....	....	....	....	....	....	1	1	....	....	....
Burnett	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....
Calumet	....	....	....	....	....	....	....	....	....	....	....	....	2	2	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Chippewa	....	....	....	4	4	8	....	....	....	1	....	1	4	6	10	1	1	2	....	....	....	....	....	....	....	1	1	....	1	1
Clark	....	....	....	4	2	6	....	....	....	....	1	1	4	7	11	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Columbia	....	....	....	2	4	6	....	....	....	....	....	....	6	7	13	....	1	1	....	....	....	2	....	2	....	1	1	1	....	1
Crawford	....	....	....	....	....	....	....	....	....	....	....	....	3	4	7	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Dane	1	....	1	4	8	12	....	....	....	1	....	1	16	14	30	3	1	4	....	....	....	1	....	1	....	1	1	....	....	....
Dodge	....	....	....	3	4	7	....	1	1	1	....	1	7	6	13	....	1	1	....	....	....	....	....	....	....	....	....	....	2	2
Door	....	....	....	....	....	....	....	....	....	....	....	....	1	3	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Douglas	....	....	....	2	5	7	1	5	6	....	....	....	14	25	39	1	....	1	....	....	....	1	3	4	....	....	....	....	1	1
Dunn	....	....	....	....	....	....	....	....	....	....	....	....	2	8	10	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1
Eau Claire	....	....	....	4	1	5	....	....	....	2	....	2	3	9	12	1	....	1	....	....	....	....	....	....	1	....	1	....	....	....
Florence	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Fond du Lac	....	....	....	2	3	5	....	....	....	....	1	1	8	8	16	....	2	2	....	....	....	2	....	2	....	1	1	....	1	1
Forest	....	....	....	3	....	3	....	....	....	1	....	1	6	6	12	....	....	....	....	....	....	1	....	1	....	1	1	....	....	....
Grant	1	....	1	3	3	6	1	....	1	1	....	1	5	7	12	3	....	3	....	....	....	....	2	2	....	....	....	....	1	1
Green	1	....	1	5	2	7	....	....	....	1	1	2	1	1	2	....	1	1	....	....	....	....	1	1	....	1	1	....	....	....
Green Lake	....	....	....	....	3	3	....	....	....	....	1	1	1	....	1	....	....	....	....	....	....	....	1	1	....	2	2	....	....	....
Iowa	....	....	....	1	2	3	1	1	2	....	1	1	2	....	2	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....
Iron	....	....	....	....	....	....	5	3	8	....	....	....	2	5	7	....	....	....	....	....	....	2	....	2	....	1	1	....	....	....
Jackson	....	....	....	1	3	4	....	....	....	....	....	....	1	1	2	1	....	1	....	....	....	1	....	1	....	1	1	....	1	1
Jefferson	....	....	....	1	....	1	....	....	....	....	....	....	4	4	8	....	....	....	....	....	....	1	....	1	....	1	1	....	....	....
Juneau	....	....	....	3	....	3	....	....	....	....	....	....	4	2	6	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....
Kenosha	....	....	....	....	2	2	....	....	....	....	....	....	12	10	22	....	1	1	....	....	....	1	....	1	....	....	....	....	....	....
Kewaunee	....	....	....	....	....	....	....	....	....	1	....	1	1	1	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

La Crosse	1	1	2	3	....	3	....	....	....	....	....	....	8	9	17	2	....	2	....	....	....	....	....	1	4	5	....	1	1
La Fayette	....	....	....	5	....	2	3	....	3	....	1	1	1	3	4	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....
Langlade	....	....	....	1	....	1	....	....	....	....	1	1	3	2	5	....	1	1	....	....	....	....	....	....	....	....	1	1	2
Lincoln	1	....	1	1	....	1	....	....	....	1	....	1	3	5	8	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Manitowoc	....	....	....	2	1	3	....	....	....	1	2	3	3	1	4	1	1	2	....	....	....	....	1	1	....	1	1	....	....
Marathon	1	....	1	4	3	7	....	....	....	....	1	1	7	8	15	....	1	1	....	....	....	....	1	1	1	....	1	....	....
Marinette	1	....	1	2	6	8	....	....	....	1	1	2	6	4	10	....	....	....	....	....	....	1	....	1	....	....	....	....	....
Marquette	....	....	....	1	....	1	....	....	....	1	1	2	3	....	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Milwaukee	1	1	2	38	56	94	....	....	....	15	10	25	105	129	234	2	4	6	2	....	2	1	2	3	2	29	31	....	....	....
Monroe	....	1	1	....	4	4	....	....	....	1	....	1	4	2	6	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Oconto	....	....	....	2	....	2	....	....	....	1	....	1	2	3	5	1	....	1	....	....	....	1	....	1	....	....	1	....	1
Oneida	1	....	1	....	....	....	....	....	....	1	....	1	2	2	4	....	1	1	....	....	....	....	....	....	....	....	....	....	....
Outagamie	....	....	....	3	3	6	....	....	....	....	2	2	4	5	9	....	1	1	....	....	....	....	....	....	2	2	....	....	....
Ozaukee	....	....	....	....	1	1	....	....	....	....	....	....	1	1	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Pepin	....	....	....	1	....	1	....	....	....	1	1	2	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Pierce	....	....	....	....	2	2	....	....	....	....	1	1	1	3	4	1	....	1	....	....	....	....	....	1	1	2	....	....	....
Polk	....	....	....	2	1	3	....	....	....	....	....	....	....	3	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Portage	....	....	....	3	1	4	....	....	....	....	....	....	....	4	7	....	....	....	....	....	....	1	....	1	....	....	....	1	1
Price	....	....	....	....	....	....	....	....	....	1	....	1	5	5	10	....	1	1	....	....	....	....	....	1	1	2	....	....	....
Racine	....	....	....	4	3	7	....	....	....	....	4	4	15	22	37	....	1	1	....	....	....	2	....	2	1	1	2	....	....
Richland	....	....	....	2	1	3	....	1	1	....	....	....	3	....	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Rock	1	....	1	3	4	7	....	....	....	....	....	....	11	14	25	....	....	....	....	....	....	....	2	2	....	2	2	....	2	2
Rusk	....	....	....	....	1	1	....	....	....	....	....	....	2	9	11	....	....	....	....	....	....	....	....	....	....	....	....	....	....
St. Croix	....	....	....	1	3	4	....	....	....	2	....	2	4	7	11	2	1	3	....	....	....	1	1	....	1	1	....	....	....
Sauk	....	....	....	2	1	3	2	1	3	....	3	3	7	6	13	....	1	1	....	....	....	3	....	3	....	1	1	....	....
Sawyer	....	....	....	....	2	2	....	....	....	....	....	....	2	....	2	....	....	....	....	....	....	....	....	....	....	1	1	....	....
Shawano	....	....	....	1	1	2	....	....	....	....	....	....	6	5	11	....	1	1	....	....	....	1	....	1	....	....	1	....	1
Sheboygan	....	....	....	2	1	3	....	....	....	1	....	1	3	8	11	....	1	1	....	....	....	....	....	....	1	1	1	1	2
Taylor	....	....	....	....	....	....	....	....	....	....	....	....	2	6	8	....	2	2	....	....	....	....	....	....	....	....	....	....	....
Trempealeau	....	....	....	1	....	1	....	....	....	....	....	....	2	1	3	....	1	1	....	....	....	....	1	1	....	1	1	....	....
Vernon	....	....	....	3	1	4	....	....	....	....	....	....	4	3	7	....	1	1	....	....	....	....	....	....	....	....	....	....	....
Vilas	....	....	....	1	....	1	....	....	....	....	....	....	2	2	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Walworth	....	....	....	3	1	4	....	....	....	1	....	1	6	8	14	1	....	1	....	....	....	....	....	....	....	....	1	1	2
Washburn	....	....	....	....	1	1	....	....	....	1	....	1	....	4	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Washington	....	....	....	2	1	3	....	....	....	....	....	....	....	2	2	....	....	....	....	....	....	....	....	....	2	2	....	1	1
Waukesha	....	....	....	....	3	3	....	1	1	....	....	....	13	14	27	....	2	2	....	....	....	....	....	....	....	....	....	1	1
Waupaca	....	....	....	1	1	2	....	....	....	....	1	1	2	3	5	....	1	1	....	....	....	....	....	....	....	....	....	....	....
Waushara	....	....	....	....	....	....	....	....	....	1	....	1	1	1	2	....	1	1	....	....	....	....	....	....	....	....	....	....	....
Winnebago	....	....	....	2	6	8	....	....	....	....	3	3	3	8	11	....	1	1	....	....	....	....	....	....	2	2	....	....	....
Wood	....	....	....	3	....	3	....	....	....	1	1	2	7	7	14	2	....	2	....	....	....	....	....	....	....	....	....	....	....
Total	11	3	14	149	165	314	14	15	29	44	43	87	393	483	876	25	36	61	2	....	2	26	16	42	9	63	72	6	20	26

TABLE NO. 27.—Concluded. SHOWING THE TOTAL DEATHS IN EACH COUNTY FROM JAN. 1, 1912, TO DEC. 31, 1913, ARRANGED ACCORDING TO THE CAUSES OF DEATH.

Counties.	Electricity.			Homicide by fire-arms.			Homicide by cutting or piercing instruments.			Homicide by other means.			Fractures—cause not specified.			Other external violence.			Ill-defined organic disease.			Sudden death.			Not specified, ill-defined.			Stillbirths.		
	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.	1912	1913	Total.
Adams	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	1	....	1	....	....	....	....	....	....	1	....	1	6	12	18
Ashland	....	....	....	....	1	1	....	....	....	....	....	....	3	5	8	3	1	4	....	....	....	....	....	....	3	5	8	16	13	29
Barron	2	....	2	....	....	....	....	....	....	....	....	....	2	1	3	....	....	....	1	....	1	....	....	....	....	1	1	25	12	37
Bayfield	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	6	8	6	6	12
Brown	....	....	....	....	....	....	....	1	1	....	....	....	3	12	15	1	1	2	1	1	2	....	....	....	8	6	14	54	43	97
Buffalo	....	....	....	....	....	....	....	....	....	....	....	....	3	....	3	....	....	....	....	....	....	....	....	....	....	1	1	11	11	22
Burnett	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2	8	3	11
Calumet	....	....	....	....	....	....	....	....	....	....	....	....	1	1	2	2	....	2	....	....	....	....	....	....	1	3	4	5	10	15
Chippewa	1	....	1	....	1	1	....	....	....	....	....	....	....	4	4	....	4	4	....	1	1	....	....	....	1	2	3	19	11	30
Clark	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	2	....	1	1	....	....	....	4	2	6	25	21	46
Columbia	1	....	1	....	....	....	....	....	....	1	....	1	3	4	7	....	2	2	1	....	1	....	....	....	2	3	5	13	24	37
Crawford	....	....	....	....	....	....	....	....	....	....	....	....	4	2	6	1	2	3	....	....	....	....	....	....	1	2	3	7	20	27
Dane	....	1	1	....	2	2	....	....	....	1	....	1	9	8	17	1	4	5	....	....	....	....	....	....	7	3	10	36	45	81
Dodge	1	1	2	....	....	....	....	....	....	....	....	....	7	3	10	2	1	3	....	....	....	....	....	....	2	1	3	19	43	62
Door	....	....	....	....	....	....	....	....	....	....	1	1	1	1	2	....	....	....	....	....	....	....	....	....	3	....	3	7	18	25
Douglas	....	1	1	....	1	1	....	....	....	1	....	1	6	1	7	2	8	10	....	....	....	....	....	....	4	5	9	35	40	75
Dunn	1	....	1	....	....	....	2	....	2	....	....	....	4	1	5	....	2	2	....	....	....	....	....	....	....	....	....	17	15	32
Eau Claire	....	2	2	....	....	....	....	....	....	....	1	1	3	4	7	1	....	1	....	....	....	....	....	....	4	6	10	18	18	36
Florence	....	2	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	3	4
Fond du Lac	1	....	1	....	....	....	....	4	4	....	....	....	8	5	13	5	2	7	....	....	....	....	....	....	8	3	11	21	26	47
Forest	1	....	1	....	....	....	....	....	....	1	....	1	1	....	1	1	1	2	....	....	....	....	....	....	....	....	....	5	5	10
Grant	1	....	1	1	....	1	....	....	....	....	....	....	2	1	3	....	1	1	....	....	....	....	....	....	7	2	9	19	20	39
Green	....	1	1	....	....	....	....	....	....	....	....	....	1	4	5	....	....	....	....	....	....	....	....	....	....	1	1	7	8	15
Green Lake	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	1	4	5	....	....	....	....	....	....	....	....	....	7	7	14
Iowa	1	3	4	1	....	1	....	....	....	....	....	....	....	3	3	2	1	3	....	1	1	....	....	....	....	3	3	17	14	31
Iron	....	1	1	....	....	....	....	....	....	1	....	1	1	....	1	1	1	2	....	....	....	....	....	....	....	2	2	5	7	12
Jackson	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2	....	1	1	....	....	....	....	....	....	2	3	5	11	8	19
Jefferson	....	2	2	....	....	....	....	....	....	....	....	....	4	4	8	1	2	3	....	....	....	....	....	....	....	1	1	15	18	33
Juneau	....	....	....	1	....	1	....	....	....	....	....	....	1	3	4	....	2	2	....	....	....	....	....	....	....	2	2	10	6	16
Kenosha	2	....	2	....	1	1	....	1	1	1	....	1	3	2	5	3	1	4	....	....	....	....	....	....	1	7	8	23	34	57
Kewaunee	....	....	....	....	1	1	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	1	1	2	4	11	15

La Crosse	....	1	1	1	....	1	....	....	....	....	1	1	....	9	9	3	5	8	1	1	2	....	....	....	4	4	8	19	22	41
La Fayette	....	....	....	1	....	1	....	....	....	....	1	1	3	3	6	....	....	....	....	....	....	....	....	....	....	1	1	9	14	23
Langlade	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	24	11	35
Lincoln	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	2	....	....	....	....	....	....	1	....	1	13	15	28
Manitowoc	....	1	1	....	....	....	1	....	1	....	....	....	7	....	7	4	2	6	1	....	1	....	....	....	5	2	7	31	38	69
Marathon	1	1	2	....	1	1	....	....	....	....	....	....	3	5	8	5	4	9	....	1	1	....	....	....	6	3	9	51	55	106
Marinette	....	....	....	....	1	1	....	....	....	....	....	....	6	2	8	....	2	2	....	2	2	....	....	....	12	....	12	21	27	48
Marquette	....	....	....	....	....	....	....	....	....	....	....	....	2	1	3	1	....	1	....	....	....	....	....	....	....	....	....	4	3	7
Milwaukee	4	5	9	8	4	12	....	5	5	5	7	12	26	11	37	7	13	20	1	1	2	....	....	....	4	4	8	459	391	850
Monroe	....	....	....	....	2	2	....	....	....	....	2	2	2	3	5	3	1	4	....	....	....	....	....	....	2	1	3	23	21	44
Oconto	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	4	....	4	3	....	3	....	....	....	6	4	10	31	16	47
Oneida	....	....	....	....	1	1	....	....	....	....	....	....	1	....	1	1	....	1	....	....	....	....	....	....	4	2	6	14	4	18
Outagamie	....	....	....	1	....	1	2	....	2	....	....	....	2	4	6	6	2	8	....	2	2	....	....	....	7	4	11	39	25	64
Ozaukee	....	2	2	....	....	....	....	....	....	....	....	....	3	....	3	1	....	1	....	....	....	....	....	....	2	2	4	6	14	20
Pepin	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	1	....	1	....	....	....	....	....	....	1	1	2	....	2	2
Pierce	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2	1	....	1	....	....	....	....	....	....	3	....	3	6	5	11
Polk	....	....	....	....	....	....	....	....	....	....	....	....	2	1	3	1	....	1	....	....	....	....	....	....	3	3	6	20	13	33
Portage	....	....	....	....	....	....	....	....	....	....	....	....	5	....	5	4	....	4	....	....	....	....	....	....	2	....	2	14	22	36
Price	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	4	....	4	....	....	....	....	....	....	1	2	3	8	9	17
Racine	....	....	....	....	2	2	....	1	1	....	....	....	2	5	7	4	6	10	....	....	....	....	....	....	7	2	9	63	40	103
Richland	....	....	....	....	....	....	....	....	....	....	....	....	1	1	2	....	....	....	....	....	....	....	....	....	....	....	....	19	13	32
Rock	1	1	2	2	1	3	....	....	....	1	....	1	4	3	7	6	2	8	....	..	....	....	....	....	3	7	10	50	37	87
Rusk	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	3	....	3	....	....	....	....	....	....	....	1	1	2	4	9	13
St. Croix	....	1	1	....	....	....	....	....	....	....	....	....	4	1	5	1	....	1	....	1	1	....	....	....	2	1	3	5	11	16
Sauk	....	....	....	....	1	1	1	....	1	....	....	....	5	4	9	4	2	6	....	....	....	....	....	....	4	3	7	25	22	47
Sawyer	....	....	....	....	....	....	....	....	....	....	....	....	1	1	2	1	....	1	....	....	....	....	....	....	....	3	3	7	7	14
Shawano	....	....	....	....	....	....	....	1	1	....	2	2	2	1	3	....	2	2	....	....	....	....	....	....	3	6	9	26	24	50
Sheboygan	1	....	1	3	....	3	....	....	....	....	....	....	2	5	7	1	4	5	....	....	....	....	....	....	5	2	7	57	36	93
Taylor	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	1	1	....	....	....	1	3	4	10	7	17
Trempealeau	....	....	....	....	....	....	....	....	....	....	....	....	2	3	5	....	2	2	....	....	....	....	....	....	1	1	2	14	20	34
Vernon	....	....	....	....	....	....	....	....	....	....	....	....	2	1	3	....	....	....	....	....	....	....	....	....	1	....	1	13	11	24
Vilas	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	1	....	1	....	....	....	....	....	....	....	....	....	4	3	7
Walworth	....	....	....	....	1	1	....	....	....	....	....	....	5	3	8	3	....	3	....	....	....	....	....	....	2	....	2	12	8	20
Washburn	....	....	....	....	....	....	....	1	1	....	....	....	1	....	1	....	1	1	....	....	....	....	....	....	....	2	2	5	2	7
Washington	....	....	....	....	1	1	....	....	....	....	....	....	3	2	5	1	....	1	....	....	....	....	....	....	1	2	3	9	13	22
Waukesha	....	....	....	....	....	....	....	....	....	....	....	....	1	1	2	....	2	2	1	....	1	....	....	....	....	1	1	18	22	40
Waupaca	....	....	....	....	....	....	....	....	....	....	....	....	6	2	8	....	2	2	....	....	....	....	....	....	4	1	5	25	14	39
Waushara	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	1	....	1	....	....	....	1	....	1	13	7	20
Winnebago	....	....	....	....	1	1	....	1	1	....	....	....	10	4	14	4	2	6	....	....	....	....	....	....	4	2	6	35	35	70
Wood	....	1	1	....	....	....	....	....	....	....	....	....	3	5	8	3	2	5	....	....	....	....	....	....	4	4	8	21	30	51
Total	19	27	46	20	23	43	6	15	21	12	16	28	190	157	347	108	102	210	11	13	24	....	....	....	172	145	317	1699	1610	3309

TABLE NO. 28.—SHOWING CAUSES OF DEATH IN WISCONSIN FROM JAN. 1, 1912 TO DEC. 31, 1913, ARRANGED ACCORDING TO COLOR, SEX, CONJUGAL CONDITION AND NATIVITY.

Name of Disease.	Color.				Sex.			Conjugal Condition.					Nativity of Deceased.						
	White.	Black.	Indian.	Unknown.	Male.	Female.	Unknown.	Single.	Married.	Widowed.	Divorced.	Unknown.	Wisconsin.	Other United States.	German.	Irish.	Great Britain.	Norwegian.	Swedish.
I																			
General Diseases:																			
Typhoid fever	546	....	....	1	341	206	....	293	219	18	7	10	315	69	64	5	6	11	9
Typhus fever	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Relapsing fever	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Malaria	6	....	....	....	4	2	....	1	3	1	....	1	1	2	1	1	....	....	....
Smallpox	7	....	....	....	4	3	....	4	3	....	....	....	7	....	....	....	....	....	....
Measles	336	....	....	1	161	176	....	324	11	2	....	....	293	24	1	....	1	1	....
Scarlet fever	478	1	....	....	234	245	....	459	18	2	....	....	413	47	7	....	1	1	1
Whooping cough	440	1	2	....	218	225	....	442	1	....	....	....	418	21	2	....	....	....	....
Diphtheria and croup	571	....	1	....	291	281	....	549	22	....	....	1	515	37	3	....	2	....	4
Influenza	606	2	3	....	290	321	....	116	271	218	2	4	172	150	144	39	20	33	6
Miliary fever	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Asiatic cholera	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Cholera nostras	30	....	....	....	19	11	....	10	10	10	....	....	8	8	7	....	1	1	....
Dysentery	69	....	....	....	39	30	....	20	25	24	....	....	19	12	15	5	2	4	2
Plague	1	....	....	....	....	1	....	1	....	....	....	....	1	....	....	....	....	....	....
Yellow fever	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Leprosy	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Erysipelas	135	....	2	....	84	53	....	51	57	27	1	1	54	19	27	6	4	4	3
Other epidemic diseases	13	....	....	....	7	6	....	8	4	1	....	....	9	3	1	....	....	....	....
Purulent infection and septicaemia	157	1	....	....	83	75	....	66	72	19	....	1	75	25	30	....	2	5	2
Glanders	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Anthrax	1	....	....	....	....	1	....	....	1	....	....	....	....	....	....	....	....	....	....
Rabies	2	....	....	....	2	....	....	2	....	....	....	....	2	....	....	....	....	....	....
Tetanus	53	....	1	....	38	16	....	37	15	2	....	....	35	7	5	1	....	1	....
Mycoses	2	....	....	....	....	2	....	2	....	....	....	....	2	....	....	....	....	....	....
Pellagra	7	....	....	....	1	6	....	1	6	....	....	....	4	1	....	....	....	1	....
Beriberi	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Tuberculosis of the lungs	3,856	13	47	1	2,089	1,828	....	1,697	1,837	311	37	35	2,077	499	529	34	33	177	59
Acute miliary tuberculosis	88	1	2	....	46	45	....	48	39	4	....	....	66	6	10	....	....	2	....

Tuberculous meningitis	252	...	1	....	148	105	....	218	31	2	2	....	216	15	9	.....	1	.....	....
Abdominal tuberculosis	212	1	4	....	104	113	....	101	96	18	2	....	104	27	51	3	4	11	3
Potts disease	53	....	....	....	27	26	....	30	20	2	....	1	33	7	8	.....	1	2	....
White swellings	15	....	....	....	10	5	....	7	4	4	....	....	7	2	2	.....	.....	.....	....
Tuberculosis of other organs	49	1	....	....	30	20	....	22	25	3	....	....	25	9	3	.....	1	2	....
Disseminated tuberculosis	91	2	1	....	48	46	....	54	33	5	2	....	66	11	6	.....	1	1	....
Rickets	45	....	....	....	19	26	....	44	1	.....	....	....	44	1	.....	.....	.....	.....	....
Syphilis	120	1	2	....	73	50	....	89	29	2	3	....	93	15	8	.....	.....	1	1
Gonococcus infection	6	....	....	....	3	3	....	5	3	.....	....	....	4	2	.....	.....	.....	.....	....
Cancer of the buccal cavity	89	....	....	....	73	16	....	9	46	28	2	4	11	15	27	6	4	12	3
Cancer of the stomach, liver	1,741	4	3	1	950	799	....	136	1,124	461	13	15	266	264	669	56	56	145	57
Cancer of the peritoneum, intestines, rectum	383	....	1	1	189	196	....	31	254	95	4	1	92	77	134	15	9	22	9
Cancer of the female genital organs	329	1	2	....	.....	332	....	28	210	91	3	....	97	90	77	4	4	21	13
Cancer of the breast	266	1	....	....	2	265	....	31	154	78	3	1	93	71	51	10	6	9	7
Cancer of the skin	120	....	....	....	82	38	....	10	63	44	1	2	11	33	36	8	4	14	2
Cancer of other organs or of organs not specified	483	1	1	1	293	193	....	56	293	126	6	5	114	103	143	17	8	26	15
Other tumors (tumors of the female genital excepted)	128	....	1	....	63	66	....	31	71	24	3	....	47	20	26	2	6	9	7
Acute articular rheumatism	412	1	....	....	194	219	....	182	154	72	3	2	216	59	61	4	11	16	6
Chronic rheumatism and gout	162	....	....	1	81	82	....	21	83	56	2	1	31	36	43	9	4	11	4
Scurvy	8	....	....	....	3	5	....	5	2	1	....	....	4	1	1	.....	.....	1	....
Diabetes	643	1	....	....	286	358	....	172	324	140	5	3	246	109	164	9	11	28	12
Exophthalmic goitre	86	....	....	....	6	80	....	21	51	14	....	....	51	9	12	.....	3	6	1
Addison's disease	14	....	....	....	6	8	....	4	7	3	....	....	8	.....	4	.....	1	.....	1
Leuchaemia	94	1	....	....	51	44	....	32	53	8	2	....	53	9	19	2	.....	4	....
Anaemia, chlorosis	327	....	1	....	144	184	....	60	198	68	....	2	144	69	56	11	4	14	3
Other general diseases	37	....	1	....	21	17	....	24	9	2	2	1	26	7	1	.....	1	.....	....
Alcoholism (acute or chronic)	216	....	1	....	209	8	....	100	70	20	9	18	94	23	27	1	3	4	4
Chronic lead poisoning	8	....	....	....	6	2	....	4	3	1	....	....	2	2	1	.....	1	.....	....
Other chronic occupation poisonings	2	....	....	....	1	1	....	.....	1	1	....	....	.....	.....	.....	.....	1	.....	....
Other chronic poisonings	5	....	....	....	3	2	....	.....	1	2	2	....	1	2	2	.....	.....	.....	....
II																			
Diseases of the nervous system and of the organs of special sense:																			
Encephalitis	47	....	....	....	28	19	....	29	14	4	....	....	29	7	5	.....	1	1	1
Meningitis	565	2	3	....	331	238	1	492	61	15	....	2	452	62	20	4	6	10	3
Locomotor ataxia	83	....	....	....	63	20	....	14	53	13	2	1	28	17	20	.....	1	3	2
Other diseases of the spinal cord	209	....	....	....	118	91	....	78	84	44	2	1	81	45	41	5	8	7	....
Cerebral haemorrhage, apoplexy	2,895	7	12	....	1,593	1,321	....	299	1,456	1,097	27	35	476	670	907	135	127	184	47
Softening of the brain	76	....	1	....	52	25	....	13	29	33	1	1	11	27	18	9	4	2	....
Paralysis without specified cause	480	1	....	....	259	222	....	41	225	206	4	5	56	153	115	24	17	35	9
General paralysis of the insane	127	1	....	....	96	32	....	26	70	30	2	....	52	30	22	3	.....	.....	2
Other forms of mental alienation	167	1	....	....	73	95	....	53	59	49	4	3	39	42	31	9	6	12	4

TABLE NO. 28.—Continued. SHOWING CAUSES OF DEATH IN WISCONSIN FROM JAN. 1, 1912, TO DEC. 31, 1913, ARRANGED ACCORDING TO COLOR, SEX, CONJUGAL CONDITION AND NATIVITY.

Name of Disease.	Color.				Sex.			Conjugal condition.					Nativity of Deceased.						
	White.	Black.	Indian.	Unknown.	Male.	Female.	Unknown.	Single.	Married.	Widowed.	Divorced.	Unknown.	Wisconsin.	Other United States.	German.	Irish.	Great Britain.	Norwegian.	Swedish.
Epilepsy	216	1	2	....	125	94	....	143	50	22	2	2	133	35	20	3	4	7	1
Convulsions (nonpuerperal)	16	....	....	....	2	14	....	7	8	1	....	....	11	2	1	.....	1	1	....
Convulsions of infants	577	1	6	....	338	246	....	584	.....	.....	.....	.....	572	10	1	.....	1	.....	....
Chorea	15	....	....	....	7	8	....	6	5	3	....	1	6	3	3	.....	1	.....	....
Neuralgia and neuritis	38	....	....	....	17	21	....	7	22	9	....	....	16	8	7	2	1	1	....
Other diseases of the nervous system	204	1	....	....	120	85	....	94	92	17	1	1	113	29	29	4	3	7	1
Diseases of the eyes and their annexa	13	....	....	....	10	3	....	5	4	2	1	1	5	3	5	.....	.....	.....	....
Diseases of the ears	44	....	....	....	28	16	....	29	11	4	....	....	32	7	4	.....	.....	.....	...
III																			
Diseases of the circulatory system:																			
Pericarditis	73	....	....	....	48	25	....	18	46	7	....	2	29	9	20	.....	2	3	2
Acute endocarditis	496	1	2	....	265	234	....	164	255	73	2	5	220	71	97	14	10	19	7
Organic diseases of the heart	4,251	14	12	2	2,318	1,961	....	576	2,095	1,503	50	55	790	896	1,377	191	155	228	77
Angina pectoris	241	....	....	1	151	91	....	19	155	65	3	....	47	72	59	9	15	15	4
Diseases of the arteries, atheroma, aneurysm, etc.	747	3	2	....	456	296	....	52	352	338	5	5	61	180	272	46	33	55	15
Embolism and thrombosis	203	....	....	....	108	95	....	29	84	86	....	4	45	49	61	9	8	13	3
Diseases of the veins (varices, haemorrhoids, phlebitis, etc.)	37	....	1	....	20	18	....	5	22	11	....	....	11	4	11	2	4	1	1
Diseases of the lymphatic system (lymphangitis, etc.)	26	....	....	....	17	9	....	17	8	1	....	....	17	5	2	.....	.....	1	....
Haemorrhage; other diseases of the circulatory system	48	....	....	....	28	20	....	26	20	2	....	....	33	7	.....	4	.....	.....	....
IV																			
Diseases of the respiratory system:																			
Diseases of the nasal fossae	11	....	....	....	4	7	....	7	2	2	....	....	8	1	1	.....	.....	.....	....
Diseases of larynx	74	....	1	...	45	30	....	64	4	6	....	1	61	4	4	.....	.....	1	....
Diseases of the thyroid body	31	....	....	....	9	22	....	8	15	8	....	....	16	8	4	.....	1	.....	....

Acute bronchitis	628	....	7	....	305	330	....	380	105	149	1	....	367	63	100	28	14	20	4
Chronic bronchitis	368	....	....	....	167	201	....	27	137	199	3	2	33	59	160	32	14	23	6
Broncho-pneumonia	1,424	....	9	1	765	669	....	987	208	231	6	2	963	117	193	29	34	25	4
Pneumonia	2,770	13	24	1	1,630	1,178	....	1,071	1,086	596	29	26	1,096	459	577	98	74	126	46
Pleurisy	156	....	1	....	74	83	....	60	63	33	....	1	71	28	18	8	5	10	1
Pulmonary congestion, pulmonary apoplexy	405	....	....	....	226	179	....	106	137	155	5	2	107	96	102	23	10	23	3
Gangrene of the lung	18	....	....	....	15	3	....	2	13	3	....	....	8	1	2	3	.....	1	1
Asthma	160	1	1	....	84	78	....	22	90	50	....	....	26	17	60	6	8	10	3
Pulmonary emphysema	31	....	....	....	15	16	....	4	15	12	....	....	7	3	8	1	.....	2	....
Other diseases of the respiratory system (tuberculosis excepted)	132	....	....	....	71	61	....	48	62	22	....	....	56	19	27	3	5	6	5
V																			
Diseases of the digestive system:																			
Diseases of the mouth and annexa	21	....	....	....	11	10	....	16	4	1	....	....	17	2	1	.....	.....	.....	....
Diseases of the pharynx	70	....	2	....	37	35	....	47	20	5	....	....	52	6	6	3	.....	.....	1
Diseases of the oesophagus	19	....	....	....	10	9	....	6	7	6	....	....	5	4	6	.....	.....	2	....
Ulcer of the stomach	189	1	....	....	123	67	....	34	119	33	3	1	63	41	54	7	6	6	4
Other diseases of the stomach (cancer excepted)	766	2	6	....	412	362	....	437	184	141	7	5	455	102	105	23	21	20	7
Diarrhea and enteritis (under 2 years)	2,353	1	20	....	1,324	1,050	....	2,374	.....	.....	.....	.....	2,232	100	16	3	2	1	1
Diarrhea and enteritis (2 years and over)	428	....	2	....	223	207	....	172	145	108	4	1	181	84	69	14	21	18	6
Ankylostomiasis	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Intestinal parasites	4	....	....	....	3	1	....	3	1	.....	.....	.....	3	.....	1	.....	.....	.....	.....
Appendicitis and typhlitis	568	....	1	....	330	239	....	351	187	27	2	2	385	82	39	4	5	12	9
Hernia, intestinal obstruction	518	1	3	....	274	248	....	176	216	124	4	2	211	76	137	14	10	25	9
Other diseases of the intestines	179	1	1	....	106	75	....	60	85	35	....	1	83	28	30	7	3	6	6
Acute yellow atrophy of the liver	16	....	....	....	9	7	....	4	10	2	....	....	7	1	5	.....	.....	2	....
Hydatid tumor of the liver	1	....	....	....	1	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cirrhosis of the liver	506	2	1	....	364	147	....	70	336	91	9	5	122	78	165	15	17	27	5
Biliary calculi	120	....	1	....	27	94	....	5	83	31	1	1	30	24	44	4	1	8	2
Other diseases of the liver	311	....	1	....	149	163	....	55	176	75	2	4	98	54	88	11	3	16	4
Diseases of the spleen	14	....	....	....	8	6	....	5	7	1	1	....	6	1	4	.....	1	1	....
Simple peritonitis (nonpuerperal)	138	....	....	....	65	73	....	61	66	10	1	....	73	23	15	.....	3	6	3
Other diseases of the digestive system (cancer and tuberculosis excepted)	52	1	....	....	31	22	....	18	23	11	1	....	17	13	12	.....	1	3	1
VI																			
Nonvenereal diseases of the genito-urinary system and annexa:																			
Acute nephritis	296	....	....	....	157	139	....	138	117	38	1	2	148	42	58	3	7	7	2
Bright's disease	2,418	6	9	....	1,416	1,017	....	370	1,317	603	30	23	608	533	625	82	89	120	47

TABLE NO. 28.—Continued. SHOWING CAUSES OF DEATH IN WISCONSIN FROM JAN. 1, 1912, TO DEC. 31, 1913, ARRANGED ACCORDING TO COLOR, SEX, CONJUGAL CONDITION AND NATIVITY.

Name of Disease.	Color.				Sex.			Conjugal condition.					Nativity of Deceased,						
	White.	Black.	Indian.	Unknown.	Male.	Female.	Unknown.	Single.	Married.	Widowed.	Divorced.	Unknown.	Wisconsin.	Other United States.	German.	Irish.	Great Britain.	Norwegian.	Swedish.
Chyluria	2	....	....	....	1	1	....	....	1	1	....	....	....	....	1	....	....	....	....
Other diseases of the kidneys and annexa	106	....	2	....	65	43	....	25	54	28	1	....	30	19	31	2	3	8	5
Calculi of the urinary passages	12	....	....	....	8	4	....	2	5	5	....	....	2	5	4	....	....	....	....
Diseases of the bladder	197	....	1	....	175	23	....	23	99	71	2	3	19	51	60	13	14	14	5
Diseases of the urethra, urinary abscess, etc	1	....	....	....	....	1	....	....	....	1	....	....	....	....	1	....	....	....	....
Diseases of the prostate	232	....	3	....	235	....	....	13	149	72	1	....	14	57	84	13	19	19	8
Nonvenereal diseases of the male genital organs	16	....	....	....	16	....	....	10	5	1	....	....	11	1	2	....	....	....	....
Uterine haemorrhage (nonpuerperal)	9	....	....	....	....	9	....	2	6	1	....	....	8	1	....	....	....	....	....
Uterine tumor (noncancerous)	46	....	....	....	....	46	....	4	32	8	2	....	21	9	10	....	....	1	2
Other diseases of the uterus	65	....	....	....	....	65	....	17	41	6	1	....	40	10	5	....	....	3	....
Cysts and other tumors of the ovary	45	....	....	....	....	45	....	11	27	7	....	....	20	8	8	....	1	3	1
Salpingitis and other diseases of the female genital organs	44	....	....	....	....	44	....	6	34	3	1	....	29	4	4	....	1	2	....
Nonpuerperal diseases of the breast (cancer excepted)	9	....	....	....	....	9	....	3	4	2	....	....	6	1	....	....	....	1	....
VII																			
The puerperal state:																			
Accidents of pregnancy	59	....	....	....	....	59	....	4	54	1	....	....	29	12	6	....	1	1	....
Puerperal haemorrhage	72	....	....	....	....	72	....	2	70	....	....	....	38	10	8	....	....	3	....
Other accidents of labor	70	....	5	....	....	75	....	....	75	....	....	....	41	11	9	....	1	1	....
Puerperal septicaemia	170	....	3	....	....	173	....	7	165	1	....	....	98	30	15	....	....	1	2
Puerperal albuminuria and convulsions	101	....	....	....	....	101	....	5	96	....	....	....	63	15	8	....	3	3	1
Puerperal phlegmasia alba dolens, embolus, sudden death	1	....	1	....	....	2	....	....	2	....	....	....	1	....	....	....	....	....	....
Following childbirth (not otherwise defined)	10	....	....	....	....	10	....	....	10	....	....	....	4	3	3	....	....	....	....
Puerperal diseases of the breast	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
VIII																			
Diseases of the skin and of the cellular tissue:																			
Gangrene	139	....	3	....	88	54	....	13	59	67	....	3	16	29	51	10	6	6	2

Furuncle	21	....	....	....	14	7	....	9	7	3	....	2	13	1	2	.....	1	1	1
Acute abscess	37	....	4	....	26	15	....	19	13	9	.....	....	25	6	1	.....	1	3	1
Other diseases of the skin and annexa	60	....	....	....	29	31	....	37	12	11	....	....	37	6	8	.....	1	3	....
IX.																			
Diseases of the bones:																			
Diseases of the bones (tuberculosis excepted)	100	....	....	....	67	33	....	55	36	8	....	1	50	14	14	1	4	.....	4
Diseases of the joints (tuberculosis and rheumatism excepted)	7	....	....	....	5	2	....	3	2	2	.....	....	4	1	1	.....	.....	.....	....
Amputations	7	....	....	....	6	1	....	3	2	1	....	1	4	1	1	.....	.....	.....	....
Other diseases of the organs of locomotion	7	....	....	....	5	2	....	1	4	2	.....	....	1	1	3	.....	.....	.....	1
X.																			
Malformations:																			
Congenital malformations	547	1	....	....	307	241	....	548	.....	.....	.....	....	543	5	.....	.....	.....	.....	....
XI.																			
Early infancy:																			
Congenital debility, icterus and sclerema	3303	2	12	1	1885	1431	2	3318	.....	.....	.....	....	3267	51	.....	.....	.....	.....	....
Other causes peculiar to early infancy	943	....	7	....	547	403	....	950	.....	.....	.....	.....	935	14	.....	.....	.....	.....	....
Lack of care	8	....	..	...	2	6	....	8	.....	.....	.....	.....	8	.....	.....	.....	.....	.....	....
XII																			
Old age:																			
Senility	2755	2	7	1	1383	1382	....	108	720	1882	12	43	40	620	951	258	195	237	57
XIII.																			
External causes:																			
Suicide by poison	165	....	....	....	107	58	....	54	86	17	5	3	75	23	40	.....	3	3	1
Suicide by asphyxia	15	....	....	....	10	5	....	6	8	1	.....	....	9	2	2	.....	.....	.....	....
Suicide by hanging or strangulation	138	....	....	....	114	24	....	35	75	22	1	5	52	12	37	3	1	5	5
Suicide by drowning	42	....	....	....	24	18	....	17	15	9	....	1	17	6	9	2	2	1	....
Suicide by firearms	195	....	2	....	183	14	....	72	91	19	6	9	82	28	29	1	.....	5	7
Suicide by cutting or piercing instruments	44	....	....	....	39	5	....	14	24	3	2	1	12	9	7	.....	.....	.....	2
Suicide by jumping from high places	3	....	....	....	2	1	....	.....	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Suicide by crushing	5	....	....	....	4	1	....	3	1	1	.....	....	2	1	2	.....	.....	.....	....
Other suicides	14	....	....	....	13	1	....	2	8	2	1	1	3	.....	6	1	1	.....	....
Poisoning by food	57	....	....	....	33	24	....	34	19	3	....	1	39	3	8	.....	.....	.....	1
Other acute poisonings	86	....	1	....	52	35	....	52	24	9	1	1	52	14	9	1	1	2	4
Conflagration	45	....	....	....	33	12	....	28	13	4	.....	....	30	6	2	.....	.....	1	1

TABLE NO. 28.—Continued. SHOWING CAUSES OF DEATH IN WISCONSIN FROM JAN. 1, 1912, TO DEC. 31, 1913, ARRANGED ACCORDING TO COLOR, SEX, CONJUGAL CONDITION AND NATIVITY.

Name of Diseases.	Color.				Sex.			Conjugal Condition.					Nativity of Deceased.						
	White.	Black.	Indian.	Unknown.	Male.	Female.	Unknown.	Single.	Married.	Widowed.	Divorced.	Unknown.	Wisconsin.	Other United States.	German.	Irish.	Great Britain.	Norwegian.	Swedish.
Burns (conflagration excepted)	235	....	1	....	102	134	....	159	51	21	3	2	152	29	16	5	1	7	1
Absorption of deleterious gases (conflagration excepted)	67	....	....	1	45	23	....	31	21	13	1	2	23	10	14	2	4	3	2
Accidental drowning	566	....	6	2	502	72	....	406	109	18	4	37	308	83	47	9	4	14	13
Traumatism by firearms	144	....	2	....	129	17	....	90	51	2	1	2	81	20	9	.....	4	3	2
Traumatism by cutting or piercing instruments	14	....	....	....	12	2	....	8	6	.....	.....	.....	8	1	1	.....	.....	1	....
Traumatism by fall	313	1	....	....	246	68	....	102	137	63	4	8	101	64	56	13	10	14	12
Traumatism in mines and quarries	29	....	....	....	29	.....	....	15	12	.....	.....	2	5	2	1	1	1	1	1
Traumatism by machines	87	....	....	....	87	.....	....	37	46	3	....	1	46	8	13	1	2	2	....
Traumatism by other crushing	863	5	7	1	802	74	....	425	302	54	4	91	322	127	101	13	17	25	14
Injuries by animals	61	....	....	....	54	7	....	27	25	8	....	1	33	5	14	.....	.....	3	1
Starvation	2	....	....	....	.....	2	....	.....	2	.....	.....	.....	1	.....	1	.....	.....	.....	....
Excessive cold	39	....	2	1	35	7	....	17	12	6	1	6	11	4	5	7	1	2	1
Effects of heat	71	....	1	....	56	16	....	30	24	13	2	3	32	4	13	.....	1	6	2
Lightning	26	....	....	....	24	2	....	14	10	2	.....	.....	17	.....	5	1	1	1	....
Electricity (lightning excepted)	46	....	....	....	44	2	....	21	22	1	....	2	26	8	5	.....	.....	.....	1
Fractures (cause not specified)	342	3	1	1	194	153	....	80	118	139	2	8	65	78	83	22	15	30	3
Other external violence	206	1	2	1	170	40	....	115	62	23	1	9	114	17	28	2	2	7	4
Homicide by firearms	43	....	....	....	33	10	....	16	22	3	1	1	14	5	5	2	.....	1	1
Homicide by cutting or piercing instruments	20	....	1	....	15	6	....	10	7	2	....	2	11	.....	1	.....	.....	.....	....
Homicide by other means	28	....	....	....	18	10	....	12	10	4	1	1	9	2	5	.....	1	1	....
XIV.																			
Ill-defined diseases:																			
Ill-defined organic disease	24	....	....	....	12	12	....	3	9	10	1	1	5	1	11	1	.....	2	....
Sudden death	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Not specified or ill-defined	306	1	9	1	188	128	1	96	147	59	5	10	114	46	53	9	9	24	14
Total	54,433	112	291	22	30,512	24,342	4	22,907	19,704	11,270	399	578	24,953	8,244	10,300	1,585	1,312	2,206	777

TABLE NO. 28.—Continued. SHOWING CAUSES OF DEATH IN WISCONSIN FROM JAN. 1, 1912, TO DEC. 31, 1913, ARRANGED ACCORDING TO COLOR, SEX, CONJUGAL CONDITION AND NATIVITY.

Name of Disease.	Nativity of Deceased.											Birthplace of father.				Birthplace of mother.			
	Polish.	Welsh.	Danish.	Italian.	French.	Canadian.	Bohemian.	Russian.	Austrian.	Other foreign.	Unknown.	Wisconsin.	United States	Foreign.	Unknown.	Wisconsin.	United States	Foreign.	Unknown.
I																			
General Diseases°	10	....	7	....	1	3	2	9	13	16	7	95	84	342	26	116	79	328	24
Typhoid fever	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Typhus fever	....	....	....	....	....	....	....	....	....	....	1	....	2	3	1	....	2	3	1
Relapsing fever	....	....	....	....	....	....	....	....	....	....	....	1	2	4	....	4	....	3	....
Malaria	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Smallpox	6	....	1	1	....	1	....	3	....	2	3	127	33	157	20	146	33	142	16
Measles	1	....	2	....	....	....	....	4	1	....	1	216	59	194	10	220	68	182	9
Scarlet fever	2	....	....	....	....	....	....	....	....	....	....	205	61	173	4	259	47	134	3
Whooping cough	4	....	2	1	....	1	....	....	....	1	2	201	60	203	8	234	49	275	14
Diphtheria and croup	1	....	6	1	1	8	5	4	5	13	3	49	118	398	46	65	116	382	48
Influenza	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Miliary fever	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Asiatic cholera	....	....	....	....	....	1	....	1	1	....	1	6	4	18	2	6	4	17	3
Cholera nostras	1	....	....	....	....	....	....	....	2	5	....	9	9	47	4	11	7	44	7
Dysentery	2	....	1	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....
Plague	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Yellow fever	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Leprosy	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Erysipelas	1	....	2	....	1	3	2	3	....	6	2	23	16	88	10	24	13	88	12
Other epidemic diseases	....	....	....	....	....	....	....	....	....	....	....	2	4	7	....	3	5	5	....
Purulent infection and septicaemia	2	....	1	1	....	2	2	2	1	5	3	26	17	109	6	29	21	102	6
Glanders	....	....	....	....	....	....	....	1	....	....	....	....	....	1	....	....	....	1	....
Anthrax	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	2	....
Rabies	....	....	....	....	....	....	....	....	....	....	....	13	7	32	2	13	13	26	2
Tetanus	1	....	2	....	....	....	....	....	1	....	1	....	2	....	....	1	1	....	....
Mycoses	....	....	....	....	....	....	....	....	....	....	....	....	3	4	....	....	2	5	....
Pellagra	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Beriberi	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Tuberculosis of the lungs	94	....	35	8	3	44	32	51	101	90	51	440	358	2,862	257	554	360	2,701	302

TABLE NO. 28.—Continued. SHOWING CAUSES OF DEATH IN WISCONSIN FROM JAN. 1, 1912, TO DEC. 31, 1913, ARRANGED ACCORDING TO COLOR, SEX, CONJUGAL CONDITION AND NATIVITY.

Name of Disease.	Nativity of Deceased.											Birthplace of Father.				Birthplace of Mother.			
	Polish.	Welsh.	Danish.	Italian.	French.	Canadian.	Bohemian.	Russian.	Austrian.	Other foreign.	Unknown.	Wisconsin.	United States.	Foreign.	Unknown.	Wisconsin.	United States.	Foreign.	Unknown.
Acute miliary tuberculosis	1	....	1	....	....	1	....	1	2	1	.....	23	11	52	5	24	6	53	8
Tuberculous meningitis	1	....	1	1	....	1	1	1	2	1	3	95	25	121	12	117	27	96	13
Abdominal tuberculosis	4	....	3	....	....	....	2	1	3	1	.....	26	28	162	1	29	32	151	5
Potts disease	1	....	....	....	....	....	....	1	....	....	.....	19	6	27	1	17	6	29	1
White swellings	....	....	1	....	....	....	....	3	....	....	.....	3	.....	12	.....	2	1	12	.....
Tuberculosis of other organs	....	....	2	1	....	1	....	1	1	3	1	18	5	25	2	14	6	27	3
Disseminated tuberculosis	1	....	1	....	....	....	1	1	2	2	1	20	7	57	10	24	9	49	12
Rickets	....	....	....	....	....	....	....	....	....	....	.....	20	5	19	1	23	5	15	2
Syphilis	....	....	....	1	....	2	....	1	....	1	.....	27	18	57	21	44	19	47	13
Gonococcus infection	....	....	....	....	....	....	....	....	1	2	1	2	.....	2	2	3	2	.....	1
Cancer of the buccal cavity	1	....	1	....	....	5	....	....	....	1	.....	.....	10	74	5	.....	11	72	6
Cancer of the stomach, liver	34	....	22	2	5	36	33	17	19	56	12	8	188	1,468	85	11	191	1,444	103
Cancer of the peritoneum, intestines, rectum	2	....	5	....	....	8	3	1	2	3	3	7	51	305	22	6	53	305	21
Cancer of the female genital organs	1	....	4	....	....	4	3	5	1	6	2	5	77	225	25	9	75	217	31
Cancer of the breast	3	....	2	....	....	8	....	3	1	2	1	1	59	187	20	7	56	180	24
Cancer of the skin	....	....	1	....	....	2	....	....	1	5	3	.....	18	82	20	.....	16	82	22
Cancer of other organs or of organs not specified	6	...	4	....	2	14	5	3	3	16	7	12	68	365	41	7	72	357	50
Other tumors (tumors of the female genital organs excepted)	....	....	2	....	....	3	2	1	1	1	2	7	14	97	11	11	14	92	12
Acute articular rheumatism	7	....	2	1	2	6	4	2	4	7	5	62	55	275	21	80	53	254	26
Chronic rheumatism and gout	5	....	1	....	1	7	2	1	1	6	1	2	24	126	11	3	24	123	13
Scurvy	....	....	1	....	....	....	....	....	....	....	.....	1	2	5	.....	.....	3	5	.....
Diabetes	4	....	5	3	2	14	7	5	2	18	5	64	94	461	25	79	95	437	33
Exophthalmic goitre	....	....	1	....	....	2	....	....	1	....	.....	7	12	64	3	10	12	59	5
Addison's disease	....	....	....	....	....	....	....	....	....	....	.....	1	.....	13	.....	3	1	10	.....
Leuchaemia	1	....	2	1	....	1	2	....	1	....	.....	15	16	62	2	19	16	57	3
Anaemia, chlorosis	4	....	2	....	....	9	2	1	1	7	1	23	56	227	22	23	59	218	28
Other general diseases	....	....	1	....	....	....	....	1	....	1	.....	12	6	19	1	12	8	17	1
Alcoholism (acute or chronic)	5	....	1	....	1	8	3	4	3	10	26	3	25	148	41	11	25	141	40
Chronic lead poisoning	....	....	....	....	....	2	....	....	....	....	.....	.....	2	6	.....	.....	2	6	.....
Other chronic occupation poisonings	1	....	....	....	....	....	....	....	....	....	.....	.....	.....	2	.....	.....	.....	2	.....
Other chronic poisonings	....	....	....	....	....	....	....	....	....	....	.....	.....	2	2	1	.....	2	2	1

II																			
Diseases of the nervous system and of the organs of special sense:								1	1		1	8	6	30	3	12	2	30	3
Encephalitis			2	1		1		1	2	3		226	64	259	21	253	69	225	23
Meningitis	3		2		1	1	1		1	3	2	2	14	58	9	2	16	56	9
Locomotor ataxia	1		2	3		4	2	1	1	3	5	30	43	124	12	32	42	122	13
Other diseases of the spinal cord	1		2	4	7	86	33	8	23	113	36	52	495	2,148	219	66	483	2,102	263
Cerebral haemorrhage, apoplexy	33		25			3	1					2	10	45	20	2	11	44	20
Softening of the brain	1		1			17	9	5	3	15	7	3	114	307	57	8	107	304	62
Paralysis without specified cause	8		8			5		1	2	1	7	6	14	84	24	9	16	74	29
General paralysis of the insane			3			8	4	1	1	1	5		18	123	27		19	115	34
Other forms of mental alienation	4			1		3		1	1	1	9	25	38	128	28	40	34	113	32
Epilepsy			1									1	1	11	3	3	1	10	2
Convulsions (nonpuerperal)												316	56	202	10	364	53	166	1
Convulsions of infants																			
Chorea	1								1			1		12	2	1	1	11	2
Neuralgia and neuritis	1					1					1	3	9	24	2	8	8	20	2
Other diseases of the nervous system	1					6	1	3	2	4	2	26	25	130	24	32	25	133	15
Diseases of the eyes and their annexa												4	2	6	1	3	2	7	1
Diseases of the ears									1			7	14	16	7	9	15	12	8
III																			
Diseases of the circulatory system:																			
Pericarditis	1		1			2	1	1		1	1	2	8	56	7	3	7	56	7
Acute endocarditis	11		3	2		16	5	6	6	7	5	60	64	335	40	67	58	341	33
Organic diseases of the heart	71		44	7	11	120	56	33	40	123	60	116	648	3,170	345	154	613	3,121	391
Angina pectoris	1		1		1	8	2	1	2	3	2	7	49	169	17	11	50	163	18
Diseases of the arteries, atheroma, aneurysm, etc	8		11			22	10	7	5	21	6	5	129	564	54	10	126	559	57
Embolism and thrombosis	4		2			1	3			3	2	9	33	137	24	11	34	136	22
Diseases of the veins (varices, haemorrhoids, phlebitis, etc.)	2		1							1		2	5	29	2	2	6	28	2
Diseases of the lymphatic system (lymphangitis, etc.)										1		7	5	11	3	6	4	13	3
Haemorrhage; other diseases of the circulatory system	2	2										16	7	22	3	15	8	21	4
IV																			
Diseases of the respiratory system:																			
Diseases of the nasal fossae						1						3	3	5		3	2	6	
Diseases of the larynx	1			1		2			1			28	6	38	3	35	10	28	2
Diseases of the thyroid body						1				1		5	9	16	1	9	5	15	2
Acute bronchitis	4		2	1	2	4	2	3	4	15	2	164	63	385	23	194	62	355	24
Chronic bronchitis	9		3	1		9	2	1	1	13	2	8	48	295	17	10	43	292	23

TABLE NO. 28.—Continued. SHOWING CAUSES OF DEATH IN WISCONSIN FROM JAN. 1, 1912, TO DEC. 31, 1913, ARRANGED ACCORDING TO COLOR, SEX, CONJUGAL CONDITION AND NATIVITY.

Name of Disease.	Nativity of Deceased.											Birthplace of father.				Birthplace of mother			
	Polish.	Welsh.	Danish.	Italian.	French.	Canadian.	Bohemian.	Russian.	Austrian.	Other foreign.	Unknown.	Wisconsin.	United States.	Foreign.	Unknown.	Wisconsin.	United States.	Foreign.	Unknown.
Broncho-pneumonia	15	....	4	9	2	10	3	1	8	13	4	651	129	591	63	499	146	739	50
Pneumonia	65	....	17	12	2	49	25	12	42	72	36	381	369	1,872	186	471	345	1,785	207
Pleurisy	1	....	1	....	....	3	2	1	....	6	2	18	21	112	6	23	22	105	7
Pulmonary congestion, pulmonary apoplexy	3	....	4	3	....	11	2	....	3	12	3	38	66	260	41	44	67	250	44
Gangrene of the lung	1	....	....	....	....	1	....	....	....	....	....	1	.....	16	1	11	.....	6	1
Asthma	7	....	1	1	....	5	8	3	1	5	1	4	10	142	6	4	11	138	9
Pulmonary emphysema	6	....	1	....	....	....	1	....	....	1	1	2	1	25	3	1	2	25	3
Other diseases of the respiratory system (tuberculosis excepted)	...	....	1	1	....	2	....	1	1	4	1	18	11	95	8	20	16	87	9
V																			
Diseases of the digestive system:																			
Diseases of the mouth and annexa	....	....	....	....	....	....	....	....	....	.....	1	5	3	11	2	7	1	11	2
Diseases of the pharynx	1	....	....	1	....	....	1	....	1	.....	.....	21	10	38	3	25	9	35	3
Diseases of the oesophagus	....	....	....	....	....	....	....	....	1	1	.....	3	3	13	.....	2	3	14	.....
Ulcer of the stomach	....	....	....	....	....	3	2	1	....	2	1	8	27	155	20	14	29	130	17
Other diseases of the stomach (cancer excepted)	8	....	1	2	1	3	3	2	1	15	5	169	117	448	40	213	106	411	44
Diarrhea and enteritis (under 2 years)	12	....	....	....	....	....	1	2	1	2	1	937	254	1,111	72	1,143	241	956	34
Diarrhea and enteritis (2 years and over)	6	....	4	....	1	1	7	2	3	10	3	57	63	274	36	72	60	257	41
Ankylostomiasis	....	....	....	....	....	....	....	....	....	....	....	.....	.....	.....	.....	.....	.....	.....	.....
Intestinal parasites	....	....	....	....	....	....	....	....	....	....	....	2	.....	2	.....	1	.....	3	.....
Appendicitis and typhlitis	2	....	5	2	....	5	2	4	3	5	5	130	88	332	19	161	81	299	28
Hernia, intestinal obstruction	10	....	3	2	....	7	3	1	3	11	.....	78	65	357	22	87	62	348	25
Other diseases of the intestines	2	....	1	....	....	3	3	3	....	4	1	26	27	119	9	29	28	112	12
Acute yellow atrophy of the liver	....	....	....	....	....	....	....	....	1	.....	.....	2	3	11	.....	2	3	11	.....
Hydatid tumor of the liver	....	....	....	....	....	....	....	....	....	1	.....	.....	.....	1	.....	.....	.....	1	.....
Cirrhosis of the liver	30	....	7	2	....	9	6	2	4	12	10	12	48	412	39	13	48	408	42
Biliary calculi	....	....	1	....	....	5	....	1	....	1	.....	5	23	89	4	4	23	86	8
Other diseases of the liver	4	....	2	....	1	6	7	3	3	9	3	19	47	230	16	25	45	224	18
Diseases of the spleen	....	....	....	....	....	....	1	....	....	.....	.....	2	2	10	.....	3	2	8	1
Simple peritonitis (nonpuerperal)	3	....	2	....	1	2	2	....	2	1	2	22	18	93	5	34	15	79	10

Other diseases of the digestive system (cancer and tuberculosis excepted)	1	....	....	....	....	....	1	1	....	2	1	8	4	35	6	7	4	36	6
VI																			
Nonvenereal diseases of the genito-urinary system and annexa:																			
Acute nephritis	5	....	2	....	....	10	1	....	3	7	1	42	47	191	16	57	40	184	15
Bright's disease	49	....	27	5	2	64	30	9	30	79	34	91	406	1,721	215	118	401	1,666	248
Chyluria	....	....	....	....	....	....	....	....	1	....	....	....	....	2	....	....	....	2	....
Other diseases of the kidneys and annexa	3	....	....	....	....	....	4	1	2	....	....	14	16	74	4	13	15	76	4
Calculi of the urinary passages	1	....	....	....	....	....	....	....	....	....	....	....	4	8	....	....	4	7	1
Diseases of the bladder	3	....	....	....	....	7	2	....	1	7	2	5	28	138	27	7	27	135	29
Diseases of the urethra, urinary abscess, etc	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	1	....
Diseases of the prostate	2	....	3	....	....	2	....	....	5	9	....	2	42	181	10	3	39	178	15
Nonvenereal diseases of the male genital organs	....	....	....	....	....	....	....	....	1	1	....	6	....	10	....	7	....	9	....
Uterine haemorrhage (nonpuerperal)	....	....	....	....	....	....	....	....	....	....	....	2	1	5	1	2	....	6	1
Uterine tumor (noncancerous)	1	....	....	1	....	....	1	....	....	....	....	....	6	40	....	1	6	38	1
Other diseases of the uterus	....	....	2	....	....	1	1	2	....	....	1	6	6	49	4	7	10	43	5
Cysts and other tumors of the ovary	....	....	....	....	....	1	1	....	....	1	1	1	4	57	3	4	2	34	5
Salpingitis and other diseases of the female genital organs	1	....	1	....	....	....	....	1	1	....	....	3	9	29	3	8	3	29	4
Nonpuerperal diseases of the breast (cancer excepted)	....	....	....	....	....	1	....	....	....	....	....	2	....	7	....	1	....	8	....
VII																			
The puerperal state:																			
Accidents of pregnancy	2	....	1	....	....	1	1	2	2	1	....	4	6	48	1	4	8	45	2
Puerperal haemorrhage	4	....	....	....	....	1	....	2	1	5	....	9	7	52	4	12	6	51	3
Other accidents of labor	4	....	....	1	....	1	1	1	1	3	....	11	13	48	3	13	11	47	4
Puerperal septicaemia	7	....	....	3	1	....	1	1	6	7	1	20	31	112	10	36	22	101	14
Puerperal albuminuria and convulsions	3	....	....	1	....	2	....	1	....	1	....	19	20	61	1	26	11	62	2
Puerperal phlegmasia alba dolens, embolus, sudden death	1	....	....	....	....	....	....	....	....	....	....	1	....	1	....	1	....	1	....
Following childbirth (not otherwise defined)	....	....	....	....	....	....	....	....	....	....	....	1	2	6	1	2	3	4	1
Puerperal diseases of the breast	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
VIII																			
Diseases of the skin and of the cellular tissue:																			
Gangrene	....	....	....	....	....	8	5	....	1	7	1	6	70	61	5	7	69	60	6
Furuncle	....	....	....	....	....	....	....	....	1	1	....	5	....	12	4	8	....	11	2
Acute abscess	1	....	....	1	....	2	....	....	....	....	....	11	7	21	2	11	7	21	2
Other diseases of the skin and annexa	2	....	....	....	1	....	1	1	....	....	....	15	8	31	6	23	5	27	5

TABLE NO. 28—Concluded. SHOWING CAUSES OF DEATH IN WISCONSIN FROM JAN. 1, 1912, TO DEC. 31, 1913, ARRANGED ACCORDING TO COLOR, SEX, CONJUGAL CONDITION AND NATIVITY.

Name of Disease.	Nativity of Deceased.											Birthplace of Father.				Birthplace of Mother.			
	Polish.	Welsh.	Danish.	Italian.	French.	Canadian.	Bohemian.	Russian.	Austrian.	Other Foreign.	Unknown.	Wisconsin.	United States.	Foreign.	Unknown.	Wisconsin.	United States.	Foreign.	Unknown.
IX.																			
Diseases of the bones:																			
Diseases of the bones (tuberculosis excepted)	....	....	2	....	1	4	1	....	1	3	1	23	19	52	6	24	20	52	4
Diseases of the joints (tuberculosis and rheumatism excepted)	....	....	....	....	....	....	1	....	....	.....	.....	2	.....	4	1	2	.....	4	1
Amputations	....	....	....	....	....	....	....	....	....	.....	1	1	.....	4	2	1	.....	4	2
Other diseases of the organs of locomotion	....	....	....	....	....	....	....	....	1	.....	.....	.....	.....	7	.....	.....	.....	7	.....
X.																			
Malformations:																			
Congenital malformations	....	....	....	....	....	....	....	....	....	.....	.....	315	61	154	18	353	56	133	6
XI.																			
Early infancy:																			
Congenital debility, icterus and sclerema	....	....	....	....	....	....	....	....	....	.....	.....	1,747	346	1,061	164	2,029	388	833	68
Other causes peculiar to early infancy	....	....	....	....	....	....	....	....	....	.....	1	504	103	321	22	592	104	244	10
Lack of care	....	....	....	....	....	....	....	....	....	.....	.....	5	.....	1	2	6	.....	1	1
XII.																			
Old age:																			
Senility	45	....	30	3	9	75	55	11	17	121	41	7	430	2,120	208	6	401	2,114	244
XIII.																			
External causes:																			
Suicide by poison	7	....	1	1	....	....	....	2	2	5	2	10	10	131	14	19	10	119	17
Suicide by asphyxia	....	....	....	....	....	1	....	....	....	1	.....	2	.....	13	.....	1	1	13	.....
Suicide by hanging or strangulation	1	....	5	....	....	2	2	4	4	5	9	10	108	11	9	11	106	12	
Suicide by drowning	....	....	....	....	....	....	....	2	1	2	.....	3	33	6	2	4	30	6	
Suicide by firearms	3	....	2	1	....	4	4	2	9	4	16	14	31	131	21	27	22	123	25
Suicide by cutting or piercing instruments	2	....	1	....	....	1	....	....	1	5	4	1	5	27	11	1	6	26	11
Suicide by jumping from high places	....	....	....	....	....	1	....	1	....	.....	.....	.....	.....	2	1	.....	.....	2	1
Suicide by crushing	....	....	....	....	....	....	....	....	....	.....	.....	.....	1	3	1	.....	1	3	1
Other suicides	....	....	....	....	....	....	2	....	....	1	.....	.....	.....	14	.....	.....	.....	14	.....

Poisoning by food	....	....	....	1	....	2	1	1	....	1	.....	18	6	31	2	21	7	28	1
Other acute poisonings	....	....	....	....	....	....	1	....	....	1	2	29	14	34	10	23	12	41	11
Conflagration	1	....	1	....	....	2	....	....	....	.....	1	8	5	28	4	8	10	22	5
Burns (conflagration excepted)	9	....	3	1	....	....	....	2	3	3	4	54	35	138	9	73	31	119	13
Absorption of deleterious gases (conflagration excepted)	1	....	....	1	....	....	....	1	....	3	4	7	4	51	6	6	7	50	5
Accidental drowning	10	....	2	1	1	4	2	5	10	8	53	121	61	324	68	136	64	298	76
Traumatism by firearms	1	....	1	6	....	1	1	1	2	9	5	31	22	82	11	41	21	75	9
Traumatism by cutting or piercing instruments	....	....	....	1	....	....	....	....	1	.....	1	2	1	9	2	3	1	8	2
Traumatism by fall	7	....	1	....	....	6	3	4	7	5	11	18	48	221	27	31	40	212	31
Traumatism in mines and quarries	....	....	....	3	....	....	....	3	2	5	4	.....	4	20	5	1	2	20	6
Traumatism by machines	5	....	....	1	....	....	1	1	3	3	1	8	7	67	5	7	10	65	5
Traumatism by other crushing	31	....	4	10	....	16	8	23	24	30	111	79	98	548	151	113	84	519	160
Injuries by animals	....	....	....	....	....	....	1	....	1	2	1	16	8	36	1	18	6	36	1
Starvation	....	....	....	....	....	....	....	....	....	.....	.....	.....	.....	2	.....	.....	.....	2	.....
Excessive cold	1	....	....	1	....	....	....	....	....	1	8	2	2	27	11	2	2	27	11
Effects of heat	2	....	....	....	....	....	....	1	5	2	4	6	6	54	6	7	3	56	6
Lightning	....	....	....	....	....	1	....	....	....	.....	.....	4	3	19	.....	8	2	16	.....
Electricity (lightning excepted)	2	....	....	....	....	1	....	....	1	1	1	8	6	30	2	11	4	28	3
Fractures (cause not specified)	7	....	3	1	1	12	2	....	3	12	10	16	49	246	36	21	48	235	43
Other external violence	4	....	3	4	....	3	1	4	1	5	11	38	19	135	18	47	21	123	19
Homicide by firearms	1	....	1	7	....	....	....	....	....	2	4	3	3	32	5	5	4	29	5
Homicide by cutting or piercing instruments	1	....	....	4	....	....	....	....	1	.....	3	5	.....	13	3	7	.....	11	3
Homicide by other means	1	....	....	....	....	2	2	....	....	2	3	1	1	19	7	1	.....	19	8
XIV.																			
Ill-defined diseases:																			
Ill-defined organic disease	....	....	....	....	....	....	1	....	2	.....	1	1	1	21	1	.....	1	21	2
Sudden death	....	....	....	....	....	....	....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Not specified or ill-defined	3	....	2	1	....	7	4	4	3	10	14	27	41	221	28	30	32	218	37
Total	787	2	390	138	65	887	467	335	515	1,188	757	9,078	7,328	34,803	3,649	10,626	7,147	33,193	3,892

TABBLE NO. 29.—SHOWING DEATHS IN CITIES DURING THE CALENDAR YEAR OF 1911 ARRANGED ACCORDING TO AGE, GROUPS AND IMPORTANT CAUSES OF DEATH.

Cities.	Population, Federal census, 1910.	Total deaths.	Annual death rate per 1,000 estimated population.	Important ages.			Important causes of death.														Stillbirths.
				Under 1 year	1-4 years.	65 years and over.	Pulmonary tuberculosis.	Other tuberculosis.	Typhoid fever.	Diphtheria.	Scarlet fever.	Measles.	Whooping cough.	Pneumonia.	Diarrhea and enteritis under two years	Meningitis.	Influenza.	Puerperal septicemia.	Cancer.	Violence.	
Cities over 50,000:																					
Milwaukee	373,857	4,726	12.6	1,206	297	1,005	358	52	73	82	57	18	7	449	360	91	15	15	254	291	405
Cities from 25,000 to 50,000:																					
Green Bay	25,236	524	20.7	173	35	100	29	10	5	7	3	3	.....	75	41	14	3	3	30	29	30
La Crosse	30,417	422	13.8	46	22	122	36	9	4	10	2	.....	4	27	4	6	1	1	33	32	19
Madison	25,531	308	12.	40	20	102	17	9	1	.....	.....	6	.....	20	3	6	1	1	24	25	12
Oshkosh	33,062	470	14.2	95	33	140	29	7	3	3	.....	8	2	24	4	9	1	1	42	18	24
Racine	38,002	467	12.2	82	33	125	50	10	11	6	4	1	2	55	21	15	7	4	23	31	49
Superior	40,384	483	11.9	93	28	63	36	10	12	17	2	1	6	41	22	12	1	3	13	50	33
Cities from 10,000 to 25,000:																					
Appleton	16,773	217	12.9	28	7	82	18	8	2	.....	1	.....	.....	11	8	3	2	.....	15	10	9
Ashland	11,594	214	18.4	26	12	37	24	5	10	1	.....	.....	.....	17	6	9	.....	1	10	20	15
Beloit	15,125	163	10.7	20	5	41	16	3	.....	.....	.....	.....	1	13	6	1	2	1	10	3	18
Eau Claire	18,310	286	15.6	26	3	91	25	3	2	3	.....	.....	.....	20	4	4	.....	.....	19	17	10
Fond du Lac	18,797	275	14.6	40	8	89	15	6	2	9	2	.....	.....	22	12	6	.....	1	15	18	12
Janesville	13,894	222	15.9	17	6	87	16	5	.....	.....	.....	2	3	25	4	3	1	1	13	20	7
Kenosha	21,371	312	14.5	19	22	61	20	4	10	1	5	1	4	19	22	9	.....	1	10	29	22
Manitowoc	13,027	159	12.1	22	5	61	16	5	2	.....	.....	.....	.....	9	2	3	.....	1	11	12	13
Marinette	14,610	194	14.8	37	17	46	17	4	11	1	1	1	5	13	6	2	1	1	12	11	15
Sheboygan	26,398	311	11.7	65	14	82	26	9	3	2	2	3	8	16	18	6	1	2	28	26	31
Wausau	16,560	260	15.6	42	21	64	15	2	4	9	8	4	.....	36	5	9	2	.....	8	21	9
Cities from 5,000 to 10,000:																					
Antigo	7,196	83	11.5	15	7	24	3	1	2	.....	.....	.....	.....	10	4	2	1	.....	4	5	4
Baraboo	6,324	70	11.	11	3	32	2	1	.....	.....	.....	.....	.....	5	4	2	.....	1	6	2	2
Beaver Dam	6,758	72	10.6	8	3	36	3	.....	.....	.....	.....	1	1	11	1	1	.....	.....	7	7	7
Chippewa Falls	8,893	153	17.2	16	2	44	13	4	5	3	1	.....	1	16	2	3	1	1	12	8	2

Grand Rapids	6,521	60	9.2	13	2	14	4	.....	.....	1	.....	.....	.....	5	4	.....	.....	2	3	4	4
Marshfield	5,783	75	12.9	15	3	11	2	.....	1	.....	.....	.....	.....	3	.....	1	.....	1	3	8	1
Menasha	6,081	82	13.4	10	4	21	3	.....	2	6	.....	.....	.....	7	.....	2	.....	.....	1	18	4
Menomonie	5,036	47	9.3	9	2	20	2	.....	.....	.....	.....	.....	.....	6	2	.....	.....	.....	2	2	4
Merrill	8,689	91	10.4	17	6	21	5	1	1	2	.....	.....	.....	12	2	2	.....	.....	.....	5	7
Neenah	5,734	69	12.	5	2	31	4	3	.....	1	.....	.....	.....	6	.....	2	.....	.....	7	2	.....
Oconto	5,629	56	9.9	13	4	25	6	.....	1	.....	1	1	.....	4	1	2	.....	.....	5	1	3
Platteville	4,452	80	17.9	12	.....	21	5	.....	.....	.....	.....	.....	.....	3	.....	1	1	.....	2	3	2
Portage	5,440	87	15.9	9	1	36	4	1	.....	1	1	1	.....	17	1	3	.....	1	2	6	2
Rhinelander	5,637	79	14.	18	6	12	4	2	.....	.....	.....	1	.....	9	7	4	.....	1	.....	9	7
So. Milwaukee	6,092	80	13.1	21	8	8	2	1	3	.....	.....	1	3	10	1	1	.....	.....	1	9	6
Stevens Point	8,692	139	15.9	29	8	44	17	5	.....	3	.....	.....	4	10	4	4	.....	.....	7	5	6
Sturgeon Bay	4,262	67	13.3	8	4	22	3	2	1	.....	1	.....	1	2	2	.....	.....	1	3	6	3
Two Rivers	4,850	45	9.2	12	1	15	4	2	1	.....	1	.....	.....	3	1	1	.....	.....	.....	1	5
Watertown	8,829	134	20.5	25	3	42	11	2	4	.....	.....	2	1	9	2	2	1	.....	9	4	2
Waukesha	8,740	109	12.4	14	2	44	8	.....	.....	.....	.....	.....	.....	4	3	1	1	1	8	8	3
Cities from 3,000 to 5,000:																					
Berlin	4,636	67	14.1	15	3	28	4	.....	.....	.....	.....	.....	1	4	3	2	1	1	3	3	2
Cudahy	3,691	44	11.9	28	4	1	1	.....	2	.....	.....	1	.....	3	6	2	.....	.....	.....	2	6
De Pere	4,477	54	12.	10	1	17	11	2	1	1	.....	.....	.....	3	1	1	.....	1	6	1	3
Ft. Atkinson	3,377	52	13.4	9	1	17	8	1	.....	.....	.....	1	.....	3	1	.....	1	.....	4	1	1
Hudson	2,810	42	14.9	7	1	11	4	1	.....	.....	.....	.....	.....	7	.....	.....	1	.....	2	4	3
Kaukauna	4,717	67	13.9	9	3	21	7	1	.....	.....	3	1	.....	3	2	.....	.....	.....	4	6	3
Lake Geneva	3,079	44	14.2	5	2	17	.....	.....	.....	.....	1	.....	.....	7	2	.....	2	.....	2	2	3
Mineral Point	2,925	24	8.2	.....	1	12	2	.....	.....	.....	1	.....	.....	3	.....	.....	1	.....	.....	1	3
Monroe	4,410	86	19.5	7	1	39	5	.....	.....	2	1	.....	.....	7	1	2	1	.....	4	8	2
New London	3,383	44	13.	4	3	14	4	2	1	.....	.....	.....	.....	6	.....	3	.....	.....	1	2	.....
Oconomowoc	3,064	52	17.	3	1	22	.....	.....	.....	.....	.....	.....	.....	3	.....	1	.....	.....	4	6	1
Plymouth	3,094	32	10.3	.....	2	15	.....	.....	1	.....	1	.....	.....	7	1	.....	.....	.....	3	3	3
Port Washington	3,792	35	9.2	10	.....	10	3	2	.....	.....	.....	.....	.....	5	2	.....	.....	.....	2	1	1
Prairie du Chien	3,149	37	11.1	4	2	12	.....	.....	.....	.....	.....	.....	.....	3	1	1	.....	.....	6	2	4
Rice Lake	3,968	52	13.1	12	1	19	.....	.....	.....	.....	1	.....	.....	3	3	.....	1	2	2	3	3
Ripon	3,739	59	15.7	6	2	30	4	.....	.....	1	.....	.....	.....	5	3	2	.....	.....	7	2	.....
Sparta	3,973	82	20.8	26	6	20	8	2	.....	.....	2	.....	4	13	3	2	.....	.....	7	2	.....
Stoughton	4,761	55	11.5	6	1	17	7	2	3	.....	.....	.....	1	2	.....	1	.....	.....	7	2	4
Tomah	3,419	62	18.1	11	2	20	2	.....	.....	.....	1	.....	.....	4	1	.....	.....	.....	8	5	3
Washburn	3,830	44	11.4	15	3	5	5	2	2	.....	.....	1	1	4	7	1	.....	.....	.....	5	2
Waupun	3,362	48	14.2	2	1	19	3	1	.....	.....	.....	.....	.....	.....	1	.....	1	.....	2	2	2
Whitewater	3,224	60	18.6	4	1	37	1	.....	.....	.....	.....	1	.....	6	.....	1	.....	.....	4	2	.....
Cities under 3,000:																					
Algoma	2,082	28	13.4	5	4	10	2	1	.....	.....	.....	2	.....	1	2	.....	1	.....	2	2	.....
Alma	1,011	18	17.8	3	.....	8	2	.....	.....	.....	.....	.....	.....	1	.....	1	.....	.....	1	.....	.....
Altoona	824	2	2.4	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Augusta	1,405	15	10.6	2	.....	9	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	2	1	.....

TABLE NO. 29—Concluded. SHOWING DEATHS IN CITIES DURING THE CALEN DAR YEAR OF 1911 ARRANGED ACCORDING TO AGE GROUPS AND IMPORTANT CAUSES OF DEATH.

Cities.	Population, Federal Census 1910.	Total deaths.	Annual death rate per 1,000 estimated population.	Important ages.			Important causes of death.														Stillbirths.
				Uder 1 year.	1-4 years.	65 years and over.	Pulmonary tuberculosis.	Other tuberculosis.	Typhoid fever.	Diphtheria.	Scarlet fever.	Measles.	Whooping cough.	Pneumonia.	Diarrhoea and enteritis under two years.	Meningitis.	Influenza.	Puerperal septicemia.	Cancer.	Violence.	
Barron	1,449	16	11.	3	.....	6	1	1	1	1	.....	.....	.....	1	.....	.....	1	1	.....	.....	.....
Black River Falls	1,917	37	19.3	3	2	19	1	.....	.....	.....	.....	.....	.....	5	.....	1	.....	1	4	4	1
Boscobel	1,525	22	14.4	2	2	16	1	.....	.....	.....	.....	.....	.....	5	.....	.....	.....	.....	3	2	1
Brodhead	1,517	27	17.7	2	.....	16	2	1	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	3	1	.....
Buffalo	255	3	11.8	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Burlington	3,212	47	14.6	6	1	19	3	.....	.....	.....	.....	.....	.....	3	.....	.....	1	.....	4	4	2
Cedarburg	1,777	25	14.	7	1	9	3	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	2	3	.....
Chetek	829	10	12.	3	.....	3	.....	.....	.....	.....	.....	.....	.....	3	.....	.....	.....	.....	1	1	.....
Chilton	1,530	11	7.1	3	.....	3	.....	.....	1	.....	1	.....	.....	.....	1	.....	.....	.....	2	.....	1
Clintonville	1,747	18	10.3	3	2	6	1	1	.....	1	.....	.....	.....	7	.....	1	.....	.....	2	2	.....
Colby	869	7	8.	.....	1	3	.....	.....	.....	.....	.....	.....	.....	1	.....	2	.....	.....	1	.....	.....
Columbus	2,523	31	12.2	1	2	17	1	.....	.....	.....	.....	.....	.....	1	.....	3	.....	.....	1	3	2
Cumberland	1,445	11	7.6	1	.....	3	.....	.....	.....	1	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	3
Darlington	1,808	20	11.	1	.....	11	2	.....	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	2	1	1
Delavan	2,450	35	14.2	1	.....	19	1	.....	.....	.....	.....	.....	.....	1	.....	.....	1	.....	2	3	.....
Dodgeville	1,791	24	13.4	.....	.....	15	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	.....	.....
Durand	1,503	13	8.6	.....	.....	6	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1	1	.....
Edgerton	2,513	23	9.1	1	2	9	1	1	.....	.....	.....	1	.....	4	1	.....	.....	.....	2	.....	2
Elkhorn	1,707	28	16.4	1	1	13	2	.....	.....	.....	.....	.....	.....	4	.....	.....	.....	.....	2	2	2
Elroy	1,729	26	15.	5	2	9	2	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Evansville	2,061	37	17.9	3	3	11	1	2	.....	.....	.....	1	.....	1	.....	1	.....	.....	7	1	.....
Fountain City	1,031	15	14.4	3	1	7	1	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	1	.....
Glenwood	954	6	6.2	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....
Greenwood	665	9	13.5	2	.....	5	.....	.....	.....	.....	.....	.....	.....	1	.....	1	.....	.....	.....	.....	.....
Hartford	2,982	30	10.	1	.....	15	1	.....	1	.....	1	.....	.....	4	.....	.....	.....	.....	5	.....	1
Horicon	1,881	19	10.1	4	1	10	.....	1	.....	.....	.....	.....	.....	1	2	1	.....	.....	4	1	3
Jefferson	2,582	28	10.8	3	2	11	6	.....	1	.....	3	.....	.....	1	2	1	.....	.....	1	1	1
Juneau	1,003	12	11.9	2	.....	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	.....

Kewaunee	1,839	22	12.	4	2	12	1							2	1				2		2
Ladysmith	2,352	25	10.6	7		2	1			1	1	1		2	1			1	2	6	1
Lake Mills	1,672	23	13.	2		15								4	1				2		2
Lancaster	2,329	31	13.3	4		13	2							3		1		1	2	2	
Mauston	1,701	15	8.8	1		10	3							1	1				1		1
Mayville	2,282	35	15.3	5	3	15	1			1				1	1	1			4	3	2
Medford	1,846	8	4.3	1		3	1												2		1
Mondovi	1,325	14	10.5	1		7	1	1	1					1					3		
Neillsville	1,957	27	13.7	7	2	10	2							2	2	2			2	1	
New Lisbon	1,074	11	10.2	1		4									1				2	1	1
New Richmond	1,988	10	5.			5	1	1						1							
Onalaska	1,146	9	7.8	3		1	2						1	2						1	
Peshtigo	1,975	16	8.1	4		8	2	1							1	1					
Phillips	1,948	15	7.7	7	1		2	1			2			2						1	1
Pittsville	450	3	6.6				1												1		
Prescott	986	11	11.7	1		6	1							1					1	2	
Reedsburg	2,615	47	17.9	5	1	12	2	2						3				1	5	5	1
Richland Center	2,652	50	18.8	3	5	14	4					2		6	4				2	1	2
River Falls	1,991	26	13.	1		13								2		1	2		2	2	1
Seymour	1,109	15	13.5			11	2							2						1	1
Shawano	2,923	36	12.3	7	3	13	4				3			3	1				3	1	2
Shullsburg	1,063	13	12.2	1		8	1												2	1	
Stanley	2,675	31	11.2	12		8	2	1	1					4	3	1			1		
Spooner	1,453	20	13.7	8	1	5	1			1			1	1			1	1	1	1	1
Tomahawk	2,907	32	11.	8	2	4	2		1					3					4	2	3
Viroqua	2,059	23	11.1	1	1	15	2					1		2					2	1	
Waupaca	2,789	48	17.2	6	1	20		1						10		1	1		3	3	
Wauwatosa	3,346	43	13.1	7	1	17	5	1						3	1				4		3
West Allis	6,645	85	12.7	32	9	7	9	2	2	4				9	6	4		1	3	4	8
West Bend	2,462	26	10.5	3	1	7	2							2	1	1			2		1
Crandon	1,833	19	10.3	5	3	3	2					1	2	6		1			1	1	
Mellen	1,833	20	10.9	6	2		2		1		2		1	1		1			1	4	1
Total	1,083,708	14,296	13.2	2,788	767	3,886	1,043	224	197	184	116	70	65	1,256	661	288	61	27	848	250	915

TABLE NO. 30—SHOWING DEATHS IN CITIES DURING THE CALENDAR YEAR OF 1912 ARRANGED ACCORDING TO AGE GROUPS AND IMPORTANT CAUSES OF DEATH.

Cities.	Population, Federal Census 1910.	Total deaths.	Annual death rate per 1,000 estimated population.	Important ages,			Important causes of death.														Stillbirths.
				Under 1 year.	1-4 years.	65 years and over.	Pulmonary tuberculosis.	Other tuberculosis.	Typhoid fever.	Diphtheria.	Scarlet fever.	Measles.	Whooping cough.	Pneumonia.	Diarrhoea and enteritis under two years.	Meningitis.	Influenza.	Puerperal septicemia.	Cancer.	Violence.	
Cities over 50,000:																					
Milwaukee	373,857	5,248	14.	1,185	425	1,080	329	62	99	99	60	31	69	627	423	77	16	24	275	279	402
Cities from 25,000 to 50,000:																					
Superior	40,384	399	9.8	87	17	59	48	6	6	6	.....	1	2	40	20	10	.....	1	17	46	24
Racine	38,002	507	13.3	104	22	124	42	8	14	9	2	.....	6	55	16	13	2	.....	24	25	50
Oshkosh	33,062	428	12.9	75	12	150	22	7	5	4	1	1	1	35	1	5	2	.....	31	15	23
La Crosse	30,417	398	13.8	43	12	116	31	7	1	3	.....	.....	1	32	9	5	2	.....	44	26	20
Madison	25,531	296	11.5	30	13	99	14	2	2	.....	1	.....	.....	27	.....	5	3	.....	25	17	12
Green Bay	25,236	440	17.4	153	23	86	24	7	6	5	5	.....	.....	59	8	10	2	2	26	23	36
Sheboygan	26,398	337	12.7	78	14	94	23	4	2	3	4	3	.....	27	17	3	3	.....	26	16	41
Cities from 10,000 to 25,000:																					
Eau Claire	18,310	250	13.6	22	2	75	21	10	3	.....	3	.....	1	19	1	7	.....	.....	22	12	7
Kenosha	21,371	358	16.7	97	45	58	17	6	7	3	47	1	1	30	30	4	.....	2	12	17	21
Fond du Lac	18,787	296	15.8	36	9	114	29	5	1	2	.....	.....	2	16	4	3	1	.....	23	21	10
Appleton	16,773	204	12.1	29	9	77	17	6	3	1	.....	.....	1	16	6	4	1	.....	17	7	13
Wausau	16,560	251	15.	45	16	60	27	10	2	1	2	.....	1	37	2	6	1	1	14	15	25
Marinette	14,610	192	13.1	35	12	44	12	3	6	.....	.....	1	.....	32	4	2	.....	.....	7	16	11
Ashland	11,594	195	16.8	30	6	24	15	5	9	1	.....	.....	.....	12	2	9	.....	.....	7	17	12
Janesville	13,894	200	14.4	21	6	84	11	1	1	.....	1	.....	.....	25	.....	2	.....	.....	11	19	8
Beloit	15,125	184	12.1	30	4	55	8	2	3	1	.....	.....	1	21	1	1	.....	1	12	13	19
Manitowoc	13,027	159	12.2	21	7	60	14	2	.....	.....	2	.....	.....	8	2	4	2	.....	8	11	4
Cities from 5,000 to 10,000:																					
Antigo	7,196	74	10.2	12	1	23	2	.....	.....	1	1	.....	.....	8	1	1	2	.....	9	3	15
Baraboo	6,324	70	11.	6	1	36	1	.....	.....	.....	1	.....	.....	5	.....	.....	1	.....	6	6	4
Beaver Dam	6,758	96	14.2	13	6	39	5	.....	.....	1	3	1	.....	9	2	.....	2	.....	7	9	6

Chippewa Falls	8,893	124	13.9	15	2	35	9	.....	3	.....	.....	.....	.....	8	2	2	1	.....	2	10	3
Grand Rapids	6,521	79	12 1	10	3	25	8	2	1	.....	.....	.....	1	5	2	.....	.....	.....	9	9	3
Marshfield	5,783	92	15.9	7	2	25	11	1	2	.....	.....	.....	.....	2	.....	4	.....	.....	8	6	3
Menasha	6,081	50	8.2	11	1	16	4	1	.....	.....	1	1	.....	5	1	1	.....	.....	3	2	3
Menomonie	5,036	47	9.3	5	1	26	6	2	.....	.....	.....	.....	.....	6	.....	2	.....	1	2	1	4
Merrill	8,689	79	9.	18	4	20	11	1	2	1	.....	.....	1	7	2	2	.....	.....	3	4	6
Neenah	5,734	62	10.7	10	.....	28	4	.....	.....	.....	.....	1	1	6	.....	1	.....	.....	6	2	3
Oconto	5,629	67	11.9	7	2	29	3	1	.....	.....	.....	.....	.....	.....	.....	1	1	.....	6	3	4
Portage	5,440	69	12.6	6	2	35	7	.....	.....	.....	1	.....	.....	13	.....	.....	.....	.....	5	7	1
Rhinelander	5,637	81	14.3	13	3	23	4	6	1	1	.....	.....	.....	10	.....	2	.....	2	4	4	11
So. Milwaukee	6,092	78	12.8	20	13	12	4	1	2	6	1	.....	.....	9	3	.....	.....	1	2	5	11
Stevens Point	8,692	110	12.6	31	5	34	5	2	1	1	.....	.....	1	2	4	6	3	.....	4	6	1
Watertown	8,829	129	14.8	12	3	56	10	1	.....	.....	3	.....	1	5	1	3	.....	.....	9	10	6
Waukesha	8,740	96	10.9	10	1	51	7	.....	1	1	.....	.....	.....	11	1	.....	.....	.....	7	3	3
West Allis	6,645	88	13.2	32	10	12	11	.....	3	3	.....	.....	1	13	5	3	.....	1	2	4	18
Cities from 3,000 to 5,000:																					
Berlin	4,636	58	12.5	5	.....	30	4	4	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	5	.....	.....
Burlington	3,212	60	18.6	7	.....	29	6	.....	.....	.....	.....	.....	.....	.....	3	2	.....	4	3	2	1
Cudahy	3,691	62	16.7	20	7	6	1	.....	2	3	.....	2	1	4	1	.....	.....	.....	1	4	7
De Pere	4,477	43	9.6	12	1	20	5	.....	.....	3	.....	.....	.....	3	1	1	.....	.....	2	1	4
Ft. Atkinson	3,877	48	12.3	3	.....	26	5	.....	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	5	4	1
Kaukauna	4,717	48	10.1	7	2	19	1	1	.....	.....	.....	.....	.....	1	1	1	.....	1	3	4	1
Lake Geneva	3,079	47	15.2	3	2	13	1	.....	.....	1	.....	.....	.....	1	1	1	2	.....	4	5	.....
Monroe	4,410	50	11.3	6	.....	22	3	1	.....	.....	.....	.....	.....	6	.....	.....	.....	.....	5	6	2
New London	3,383	41	12.1	8	.....	19	3	.....	.....	.....	.....	1	.....	2	.....	1	.....	.....	5	1	2
Oconomowoc	3,054	47	12.1	6	2	24	3	1	.....	.....	.....	.....	.....	5	1	1	.....	.....	3	3	2
Platteville	4,252	72	16.1	8	2	39	4	1	.....	.....	.....	.....	1	4	1	1	.....	.....	9	3	1
Plymouth	3,094	27	8.7	1	.....	11	.....	.....	1	.....	.....	.....	.....	2	.....	.....	1	.....	1	2	3
Port Washington ..	3,792	55	14.5	12	2	18	1	.....	1	.....	1	1	.....	7	1	.....	.....	.....	2	3	2
Prairie du Chien....	3,149	53	16.8	9	1	23	2	.....	.....	.....	.....	.....	1	1	1	.....	1	.....	9	4	2
Rice Lake	3,968	47	11.8	7	4	12	3	.....	.....	.....	1	.....	.....	2	2	1	.....	1	1	1	1
Ripon	3,739	53	13.9	3	1	32	4	.....	1	.....	.....	.....	.....	2	.....	.....	2	.....	8	4	3
Sparta	3,972	50	12.5	10	2	21	2	2	.....	.....	1	.....	.....	7	.....	1	1	.....	4	2	3
Stoughton	4,761	48	10.	6	.....	18	5	1	.....	.....	.....	.....	.....	3	.....	1	1	1	2	5	1
Sturgeon Bay	4,262	47	11.	4	1	18	2	.....	.....	1	.....	.....	.....	4	.....	.....	1	.....	3	4	1
Tomah	3,419	49	14.3	2	3	24	1	.....	.....	1	.....	.....	.....	4	.....	.....	.....	.....	3	4	4
Two Rivers	4,850	47	9.6	11	2	18	4	.....	.....	1	.....	.....	.....	5	.....	1	.....	.....	.....	2	3
Washburn	3,830	25	6.5	5	1	6	2	.....	.....	.....	.....	.....	.....	3	1	.....	.....	.....	1	2	1
Waupun	3,362	37	11.	4	.....	20	3	1	1	.....	1	.....	1	1	.....	.....	2	.....	1	1	1
Wauwatosa	3,346	59	17.6	11	2	24	.....	1	2	.....	.....	.....	.....	7	2	1	.....	1	3	2	3
Whitewater	3,224	40	12.4	5	.....	21	3	2	.....	.....	.....	.....	.....	5	1	.....	.....	.....	.....	2	1

TABLE NO. 30—Concluded. SHOWING DEATHS IN CITIES DURING THE CALENDAR YEAR OF 1912 ARRANGED ACCORDING TO AGE GROUPS AND IMPORTANT CAUSES OF DEATH.

Cities.	Population, Federal census 1910.	Total deaths.	Annual death rate, per 1,000 estimated population.	Important ages.			Important causes of death.														Stillbirths.
				Under 1 year.	1-4 years.	65 years and over.	Pulmonary tuberculosis.	Other tuberculosis.	Typhoid fever.	Diphtheria.	Scarlet fever.	Measles.	Whooping cough.	Pneumonia.	Diarrhea and enteritis under two years.	Meningitis.	Influenza.	Puerperal Septicemia.	Cancer.	Violence.	
Cities under 3,000:																					
Algoma	2,082	21	10.	1	1	12	4	.....	.....	.....	1	.....	.....	1	1	1	.....	.....	2	1	.....
Alma	1,011	7	6.9	.....	.....	3	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....
Altoona	824	4	4.8	2	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
Augusta	1,405	12	8.5	.....	.....	4	4	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	.....
Barron	1,449	18	12.4	4	.....	4	3	..	.....	.....	.....	.....	.....	2	.....	.....	1	1	.....	1	1
Black River Falls	1,917	31	16.1	6	....	13	1	.....	.....	.....	.....	.....	1	1	1	2	.....	.....	3	1	2
Boscobel	1,525	17	11.1	1	.....	11	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	2	1
Brodhead	1,517	21	13.8	2	.....	10	1	.....	1	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	2	.....
Buffalo	255	4	15.6	1	2	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cedarburg	1,777	15	8.4	3	.....	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chetek	829	7	8.4	2	.....	5	.....	.....	.....	.....	.....	.....	.....	3	1	.....	.....	.....	.....	1	1
Crandon	1,833	17	9.2	5	2	1	.....	.....	.....	.....	.....	.....	.....	4	.....	1	.....	.....	.....	1	1
Chilton	1,530	24	15.6	1	1	5	2	1	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	3	.....
Clintonville	1,74[illegible]	19	10.8	4	.....	8	1	.....	.....	.....	.....	.....	.....	2	.....	1	.....	.....	2	1	1
Colby	3[illegible]	7	8.	.....	.....	4	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	.....
Columbus	2,523	38	15.	3	.....	24	1	.....	.....	.....	.....	.....	.....	5	.....	2	.....	1	3	2	1
Cumberland	1,445	12	8.3	2	1	1	.....	.....	.....	.....	.....	.....	.....	1	.....	1	.....	.....	2	2	2
Darlington	1,808	22	12.1	1	.....	12	1	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	1	1	1
Delavan	2,450	38	15.5	1	3	19	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	4	.....
Dodgeville	1,791	28	15.6	2	1	17	1	.....	.....	.....	.....	.....	.....	2	1	.....	.....	.....	1	.....	1
Durand	1,503	22	14.6	5	.....	8	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	1	1	1	3	.....
Edgerton	2,513	30	11.9	6	2	13	1	1	.....	.....	.....	.....	.....	3	.....	1	.....	.....	2	2	1
Elkhorn	1,707	30	17.5	2	.....	20	2	.....	.....	.....	1	.....	.....	.....	.....	.....	1	.....	3	1	1
Elroy	1,729	28	16.1	1	1	10	1	.....	.....	1	.....	.....	.....	.....	3	1	.....	.....	2	1	.....
Evansville	2,061	36	17.4	3	.....	19	1	1	.....	.....	.....	.....	.....	3	.....	.....	1	.....	1	4	3
Fountain City	1,031	18	17.4	2	1	7	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	1	1	2	2	1
Glenwood	954	8	8.3	.....	.....	4	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Greenwood	665	11	16.5	1	.....	3	1	.....	1	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....

Hartford	2,982	27	9.	2	1	12	1	1	2					1				1	2	1
Horicon	1,881	19	10.1	3	2	7	2						1	1	1	1			2	1
Hudson	2,810	50	17.	4		19	4							2					3	3
Jefferson	2,582	45	17.4	4	2	15	4			2	5				1		2	1	2	2	
Juneau	1,003	9	8.9	1		2	1	1								1				2	1
Kewaunee	1,839	16	8.6	2		9	2							2					1		
Ladysmith	2,352	41	17.4	12	3		2	1			1			3	1	1		4	7	1
Lake Mills	1,672	37	22.1	3		18	2				1		1	4	1			3	2	2
Lancaster	2,329	32	13.7	3		12	1		1					1	1			3	1	1
Mauston	1,701	31	18.2	1		15	3				1			2	1	1		3	1	
Mayville	2,282	25	10.9	8	1	6	1			2			1	2		1		1	5	
Medford	1,846	20	10.8	4		4					1			2	2				1	
Mellen	1,833	19	10.3	7	3		2			1				2		1		1	4	1
Mineral Point	2,925	38	12.9	3	1	20	2							8		1			2	4
Mondovi	1,325	11	8.3			4	1							1				1	1	2
Neillsville	1,957	19	9.7	1		10	4							2				2	1	
New Lisbon	1,074	10	9.3			6										1		1		
New Richmond	1,988	30	15.	4		7	2	2	1					1				1	2	1
Onalaska	1,146	9	7.8	1		2	2							1					1	
Peshtigo	1,975	30	15.1	4	1	7	8				2							2		1
Phillips	1,948	12	6.1	2		4	1			1				1		2		1	3	
Pittsville	450	2	4.4	1		1														
Prescott	936	8	8.5			6								1						
Park Falls	1,972	24	12.1	8	1	1	1							3		1	1	1	1	3
Reedsburg	2,615	32	12.2	2	1	12	3		1					2				1	5	
Richland Center	2,652	45	16.9	10	1	19	2						1	4		1		2	1	5
River Falls	1,991	29	14.5	4	1	17	1							2			1		4	1
Seymour	1,109	15	13.5	3		6		1							1			2	2	
Shawano	2,923	31	10.6	10	2	11	1		1					4		1			3	1
Shullsburg	1,063	19	17.8	2	2	12	1							1		1		2		
Spooner	1,453	13	8.9	3		2	1							1				2		2
Stanley	2,675	27	10.	6	8	3	1			1				2	1			1	2	1
Tomahawk	2,907	35	12.	6		4	1			1			1	4				3	4	7
Viroqua	2,059	26	12.6	4	2	13	1						1	1		1	1		2	1
Waupaca	2,789	42	15.	2	1	25								1		1		2	3	3
West Bend	2,462	53	21.5	9	3	19	4			1			1	6	1			5	2	1
Total	1,085,680	14,522	13.4	2,744	800	4,073	974	196	208	173	156	46	105	1,426	605	238	64	51	853	870	958

TABLE NO. 31.—SHOWING DEATHS IN CITIES DURING THE CALENDAR YEAR OF 1913 ARRANGED ACCORDING TO AGE GROUPS AND IMPORTANT CAUSES OF DEATH.

Cities.	Population, Federal census, 1910.	Total deaths.	Annual death rate per 1,000 estimated population.	Important ages.			Important Causes of death.														Stillbirths.
				Under 1 year.	1-4 years.	65 years and over.	Pulmonary tuberculosis.	Other tuberculosis.	Typhoid fever.	Diphtheria.	Scarlet fever.	Measles.	Whooping cough.	Pneumonia.	Diarrhea and enteritis under two years	Meningitis.	Influenza.	Puerperal septicemia.	Cancer.	Violence.	
Cities over 50,000:																					
Milwaukee	373,857	5,211	13.9	1,265	395	1,089	335	82	49	141	61	27	12	561	358	73	23	18	282	358	353
Cities from 25,000 to 50,000:																					
Superior	40,384	508	12.5	97	37	72	49	7	5	.....	1	11	4	55	9	18	.....	1	18	50	41
Racine	38,002	512	13.4	97	29	117	41	12	6	12	2	1	2	60	14	10	2	2	29	40	32
Oshkosh	33,062	481	14.5	82	21	156	29	15	7	4	.....	2	6	37	5	8	1	2	31	17	23
La Crossse	30,417	411	13.5	51	17	144	26	10	4	4	.....	1	.....	35	6	7	3	3	33	31	22
Madison	25,531	357	13.8	45	14	110	18	13	1	2	2	.....	2	36	4	5	1	1	36	34	21
Green Bay	25,236	456	18.0	131	23	104	22	10	3	.....	4	.....	3	38	16	17	1	4	17	21	31
Sheboygan	26,398	382	14.4	85	28	109	27	9	5	5	3	2	9	42	9	8	.....	.....	22	13	20
Cities from 10,000 to 25,000:																					
Eau Claire	18,310	309	16.8	30	22	108	13	4	5	.....	2	3	.....	28	3	6	1	1	17	13	12
Kenosha	21,371	260	12.1	76	15	45	18	3	11	2	4	4	1	24	17	4	1	1	14	20	25
Fond du Lac	18,797	295	15.6	39	4	110	17	8	6	.....	.....	.....	4	23	3	2	2	1	25	11	12
Appleton	16,773	224	13.3	31	8	62	13	2	1	2	.....	.....	.....	24	3	4	1	.....	20	11	9
Wausau	16,560	232	14.0	37	12	65	21	2	4	1	1	.....	3	21	3	5	.....	.....	14	16	15
Marinette	14,610	170	11.6	26	9	49	9	6	3	.....	.....	.....	.....	15	9	4	.....	.....	12	10	12
Ashland	11,594	217	18.7	20	13	36	12	3	8	.....	.....	2	1	30	2	11	1	.....	14	21	10
Janesville	13,894	209	15.0	17	5	82	13	5	2	.....	1	.....	.....	21	1	2	.....	.....	22	14	9
Beloit	15,125	186	12.2	29	7	62	9	3	.....	1	.....	1	1	22	.....	3	5	.....	9	11	12
Manitowoc	13,027	204	15.6	31	10	71	12	4	3	2	4	.....	.....	5	5	3	5	.....	12	10	15
Cities from 5,000 to 10,000:																					
Antigo	7,196	93	12.9	22	3	28	4	.....	2	1	.....	.....	.....	11	1	.....	.....	.....	7	3	2
Baraboo	6,324	63	9.9	9	.....	28	2	1	.....	.....	.....	.....	.....	2	1	.....	1	.....	3	4	5
Beaver Dam	6,758	93	13.7	13	4	31	15	.....	1	.....	.....	.....	.....	12	1	2	2	.....	4	5	13

Chippewa Falls	8,893	155	17.4	17	1	44	6	3	3	1	.....	.....	2	17	2	5	4	1	11	8	6
Grand Rapids	6,521	80	12.2	16	6	23	7	1	3	.....	.....	.....	.....	10	5	.....	.....	.....	5	4	5
Marshfield	5,783	118	20 4	17	4	20	4	1	3	.....	.....	.....	.....	15	4	3	1	.....	8	10	6
Menasha	6,081	62	10.1	21	3	6	8	3	.....	.....	.....	.....	1	6	2	1	.....	.....	4	5	2
Menomonie	5,036	71	14.0	12	5	25	6	1	.....	.....	1	.....	1	9	2	2	1	.....	2	7	1
Merrill	8,689	82	9.4	20	2	22	3	1	.....	.....	.....	.....	.....	12	2	2	.....	.....	10	7	8
Neenah	5,734	72	12.5	6	2	36	4	.....	.....	.....	.....	.....	.....	8	1	.....	2	.....	7	2	2
Oconto	5,629	82	14.5	10	.....	33	8	1	.....	.....	.....	.....	.....	4	.....	.....	3	2	4	4	3
Portage	5,440	64	11.7	13	.....	26	5	1	.....	.....	.....	.....	1	6	2	1	1	.....	3	5	9
Rhinelander	5,637	40	7.0	8	3	11	2	.....	1	.....	.....	.....	.....	5	2	.....	.....	.....	1	4	5
So. Milwaukee	6,092	82	13.4	23	10	9	3	.....	.....	8	.....	.....	.....	7	7	4	.....	.....	2	4	11
Stevens Point	8,692	101	11.6	20	6	34	6	.....	2	1	.....	1	1	7	6	2	2	.....	6	6	6
Watertown	8,829	143	16.1	16	2	62	12	3	.....	.....	1	.....	1	10	1	.....	.....	.....	9	9	6
Waukesha	8,740	108	12.3	10	3	48	10	.....	.....	.....	.....	2	.....	4	.....	.....	.....	.....	3	6	8
West Allis	6,645	83	12.4	27	9	15	6	3	1	1	.....	1	.....	6	10	.....	.....	.....	2	4	10
Cities from 3,000 to 5,000:																					
Berlin	4,636	64	13.8	8	3	27	3	1	.....	3	.....	.....	.....	6	.....	.....	2	.....	5	4	3
Burlington	3,212	46	14.3	6	2	22	2	.....	.....	.....	.....	.....	.....	2	.....	1	.....	.....	5	.....	2
Cudahy	3,691	64	17.3	40	7	4	.....	.....	2	3	.....	.....	.....	3	4	3	.....	.....	1	3	5
De Pere	4,477	49	10.9	12	1	21	3	1	1	.....	1	.....	.....	3	3	1	.....	.....	3	4	1
Ft. Atkinson	3,877	54	13.9	4	1	32	7	1	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	9	3	3
Kaukauna	4,717	53	11.2	7	2	13	4	.....	1	.....	.....	.....	.....	6	.....	.....	.....	.....	4	4	5
Lake Geneva	3,079	38	12.3	5	.....	10	2	1	.....	.....	.....	.....	.....	3	.....	1	1	.....	1	4	.....
Monroe	4,410	71	16.0	6	2	37	3	.....	.....	.....	.....	.....	.....	5	.....	4	1	.....	4	1	3
New London	3,383	40	11.8	11	5	16	1	.....	.....	.....	.....	.....	.....	4	.....	1	.....	.....	.....	1	2
Oconomowoc	3,054	55	18.0	.....	.....	32	4	1	.....	.....	1	.....	.....	4	.....	.....	1	.....	6	6	2
Platteville	4,452	63	14.1	5	2	35	3	1	.....	.....	.....	.....	.....	2	2	1	.....	.....	.....	.....	2
Plymouth	3,094	37	11.9	6	2	16	1	.....	.....	.....	.....	.....	.....	3	1	1	.....	.....	1	3	.....
Port Washington ..	3,792	41	10.8	8	4	9	5	1	.....	.....	.....	.....	.....	9	1	1	.....	.....	2	.....	4
Prairie du Chien...	3,149	66	20.9	8	.....	23	3	.....	.....	.....	.....	.....	.....	8	1	1	3	.....	5	4	7
Rice Lake	3,968	45	11.3	3	3	16	4	.....	.....	.....	.....	.....	.....	7	.....	1	1	.....	4	2	2
Ripon	3,739	61	16.3	5	2	35	2	1	.....	.....	.....	.....	.....	2	2	.....	1	.....	8	2	1
Sparta	3,973	72	18.1	18	2	29	5	2	.....	.....	.....	.....	.....	11	1	1	.....	.....	6	2	4
Stoughton	4,761	55	11.5	2	3	21	6	.....	2	1	2	.....	.....	3	1	.....	1	.....	3	3	2
Sturgeon Bay	4,262	46	10.7	4	2	16	3	1	1	.....	.....	1	.....	3	.....	1	1	1	4	1	6
Tomah	3,419	50	14.6	5	1	21	2	1	.....	.....	.....	.....	.....	7	1	.....	.....	.....	2	2	5
Two Rivers	4,850	51	10.5	9	2	11	6	1	.....	.....	.....	.....	.....	6	1	.....	.....	.....	.....	8	6
Washburn	3,830	24	6.2	4	2	8	2	1	1	.....	.....	.....	.....	.....	.....	.....	.....	1	1	.....	2
Waupun	3,362	31	9.2	.....	1	18	3	.....	.....	.....	.....	.....	.....	2	.....	.....	2	.....	3	.....	2
Wauwatosa	3,346	63	18.8	8	1	35	5	.....	.....	.....	.....	.....	.....	7	5	.....	.....	.....	4	1	2
Whitewater	3,224	45	13.9	1	2	27	2	.....	.....	.....	.....	.....	.....	6	1	.....	.....	.....	9	3	.....

TABLE NO. 31—Concluded. SHOWING DEATHS IN CITIES DURING THE CALENDAR YEAR OF 1913 ARRANGED ACCORDING TO AGE GROUPS AND IMPORTANT CAUSES OF DEATH.

Cities.	Population, Federal census 1910.	Total deaths.	Annual death rate per 1,000 estimated population.	Important ages.			Important causes of death.														Stillbirths.
				Under 1 year.	1-4 years.	65 years and over.	Pulmonary tuberculosis.	Other tuberculosis.	Typhoid fever.	Diphtheria.	Scarlet fever.	Measles.	Whooping cough.	Pneumonia.	Diarrhea and enteritis under two years.	Meningitis.	Influenza.	Puerperal septicemia.	Cancer.	Violence.	
Cities under 3,000:																					
Algoma	2,082	16	7.6	1	3	5	1	1	.....	1	.....	1	.....	1	1	1	.....	.....	.....	.....	3
Alma	1,011	10	9.8	1	.....	4	1	.....	.....	.....	.....	.....	.....	3	1	.....	.....	.....	.....	.....	.....
Altoona	824	8	9.7	3	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	1
Augusta	1,405	24	17.	4	3	8	4	.....	.....	.....	.....	.....	1	4	.....	.....	.....	.....	2	4	.....
Barron	1,449	15	10.	2	.....	5	3	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	3	.....	.....
Black River Falls	1,917	21	10.9	3	2	6	1	.....	1	.....	.....	.....	.....	2	.....	.....	.....	.....	3	.....	.....
Boscobel	1,525	26	17.	1	.....	14	.....	1	.....	.....	.....	.....	.....	1	.....	.....	2	.....	2	.....	1
Brodhead	1,517	32	21.	.....	1	26	2	.....	.....	.....	.....	.....	.....	.....	1	.....	1	.....	6	2	.....
Buffalo	255	2	7.8	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	1	.....	.....
Cedarburg	1,777	17	9.5	2	.....	9	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	1
Chetek	829	6	7.2	.....	.....	3	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1	.....
Crandon	1,833	16	8.7	1	.....	2	4	.....	1	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	2	1
Chilton	1,530	15	9.8	1	2	4	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	1	.....
Clintonville	1,747	13	7.4	3	.....	5	1	.....	.....	.....	.....	.....	.....	7	.....	.....	.....	.....	.....	.....	.....
Colby	869	7	8.	.....	.....	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	1	.....
Columbus	2,523	44	17.4	3	2	21	3	.....	1	.....	.....	.....	.....	3	.....	.....	1	.....	7	2	2
Cumberland	1,445	20	13.8	4	.....	2	.....	1	1	.....	.....	.....	.....	1	.....	.....	1	.....	3	1	.....
Darlington	1,808	29	16.	5	.....	12	2	.....	.....	.....	.....	.....	1	1	.....	.....	.....	.....	2	2	2
Delavan	2,450	44	17.9	3	.....	25	1	.....	.....	.....	.....	.....	.....	4	.....	.....	.....	.....	3	1	.....
Dodgeville	1,791	31	17.3	3	.....	15	1	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	3	.....	2
Durand	1,503	19	12.6	3	.....	6	1	.....	.....	.....	.....	.....	.....	3	.....	.....	.....	.....	1	3	.....
Edgerton	2,513	30	11.9	4	1	11	3	1	.....	.....	.....	.....	.....	2	.....	1	.....	.....	2	.....	4
Elkhorn	1,707	23	16.4	4	1	15	2	.....	1	.....	.....	.....	1	.....	.....	.....	1	.....	1	1	1
Elroy	1,729	15	8.6	2	.....	7	3	.....	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	2	.....	.....
Evansville	2,061	10	4.8	.....	.....	5	1	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....
Fountain City	1,031	13	12.6	.....	.....	8	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....
Glenwood	954	7	7.3	.....	.....	4	1	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	1	.....	.....
Greenwood	865	6	9.	1	.....	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	.....

Hartford	2,982	38	12.7	7	1	17	3				1				1		1	1		6
Horicon	1,881	33	17.5	8	2	14	3						1	4		1			1	1	4
Hudson	2,810	47	16.7	8	2	18	1		2			1		6				1	3	2
Jefferson	2,582	41	15.8	2	1	20	3				6			2			2	3	1	2
Juneau	1,008	14	13.9	3	1	7												3	1	
Kewaunee	1,839	18	9.7	2		9		1		1				1				2	2	
Ladysmith	2,352	33	14.	8	5	3	1			1			2	4	2	1		1	4	3
Lake Mills	1,672	19	11.3		2	11	1						1			1			2	
Lancaster	2,329	34	14.5	4	1	13	4							2	3			6	2	
Mauston	1,701	27	15.8	3		17	3							2				1	1	
Mayville	2,282	32	14.	8	1	10	2			1				2	1	1		2	2	6
Medford	1,846	12	6.5	2		7								2			1	1	2	2
Mellen	1,833	14	7.6	2	3			2		1				1					6	
Mineral Point	2,925	26	8.8		2	9	3	1						4					1	3
Mondovi	1,325	11	8.3	2		6	1											1		1
Neillsville	1,957	22	11.2	2		13	2	1										4	1	1
New Lisbon	1,074	17	15.8	1	1	7					2							1	1	
New Richmond	1,988	7	3.5			2	1							3		1				
Onalaska	1,146	8	7.8			6													1	
Peshtigo	1,975	25	12.6	6	1	10	2							2				1		1
Phillips	1,948	13	6.6	3		3	1		1								1	1	2	2
Pittsville	450	7	15.5			2	2							1						
Prescott	936	17	18.1	1		10	1											2	1	1
Reedsburg	2,615	52	19.8	4	1	24	1	1						3	1			7	4	
Park Falls	1,972	26	13.1	6	2	2	3					1		2				1	3	1
Richland Center	2,652	41	15.4	5	1	18	2							6				2	3	2
River Falls	1,991	29	14.5	1		15	2	2						2				4		
Seymour	1,109	8	7.2			4	1												2	
Shawano	2,923	44	15.0	10	2	12	3	1						2	1	1			4	4
Shullsburg	1,063	11	10.3			8												2	1	
Spooner	1,453	23	15.8	13	1	1		1					3	1				1	2	
Stanley	2,675	20	7.4	5		8						1		1	1			1	1	
Tomahawk	2,907	26	8.9	1		6	2							3				4	1	2
Viroqua	2,059	20	9.7	2		12	1				1			1		1		2		
Waupaca	2,789	39	13.9	1	1	19	7											3	3	3
West Bend	2,462	44	17.8	8		18	2	3						3		1	1	2	2	1
Total	1,085,080	14,922	13.7	2,886	830	4,219	974	248	155	200	101	63	65	1,439	554	242	90	44	917	946	918

INDEX.

I.—GENERAL

—A—

— B —

— C —

—D—

—E—

—F—

—K—

—L—

—M—

—S—

—T—

—Y—

II.—STATISTICAL TABLES.

PART I.

III.—VITAL STATISTICS.

PART II.

THE UNIVERSITY OF WISCONSIN

BIENNIAL REPORT

OF THE

BOARD OF REGENTS

FOR THE

Years 1912-13 and 1913-14

MADISON, WIS.
DEMOCRAT PRINTING COMPANY, STATE PRINTER
1914

THE REGENTS OF THE UNIVERSITY

THE REGENTS

CHARLES R. VAN HISE, President of the University, ex officio.
CHARLES P. CARY, State Superintendent of Public Instruction, ex officio.

	TERM EXPIRES
State-at-Large—GILBERT E. SEAMAN, Milwaukee	1919
State-at-Large—MRS. FLORENCE G. BUCKSTAFF, Oshkosh	1917
First District—A. J. HORLICK, Racine	1919
Second District—F. W. A. NOTZ, Watertown	1918
Third District—EDWARD M. McMAHON, Madison	1919
Fourth District—THEODORE M. HAMMOND, Wauwatosa	1916
Fifth District—JAMES F. TROTTMAN, Milwaukee	1915
Sixth District—MISS ELIZABETH A. WATERS, Fond du Lac	1915
Seventh District—D. O. MAHONEY, Viroqua	1920
Eighth District—GRANVILLE D. JONES, Wausau	1916
Ninth District—ORLANDO E. CLARK, Appleton	1918
Tenth District—BEN F. FAAST, Eau Claire	1920
Eleventh District—A. P. NELSON, Grantsburg	1917

OFFICERS OF THE REGENTS

JAMES F. TROTTMAN, *President.*
A. P. NELSON, *Vice-President.*
HENRY JOHNSON, STATE TREASURER, *ex officio Treasurer.*
H. J. THORKELSON, *Acting Business Manager.*
M. E. McCAFFREY, *Secretary.*
G. L. GILBERT, *Bursar.*
C. W. FARLIN, *Purchasing Agent.*

STANDING COMMITTEES

(The President is ex officio a member of all standing committees)
Executive—HAMMOND, SEAMAN, McMAHON.
College of Letters and Science—BUCKSTAFF, NOTZ, SEAMAN, WATERS, CLARK.
College of Agriculture—MAHONEY, JONES, NELSON, HORLICK, FAAST.
Law School—CLARK, JONES, MAHONEY.
Trust Funds—McMAHON, JONES, SEAMAN.
Finance—JONES, NELSON, HAMMOND, CLARK, McMAHON.
College of Engineering—NOTZ, HAMMOND, FAAST.
Medical School—SEAMAN, CARY, HORLICK.
University Extension—CARY, BUCKSTAFF, SEAMAN, NOTZ, CLARK.
Physical Education—NELSON, WATERS, MAHONEY.
Summer Session—FAAST, WATERS, NELSON.
Women's Affairs—WATERS, BUCKSTAFF, JONES.
Constructional Development—SEAMAN, JONES, McMAHON, BUCKSTAFF, HAMMOND.
By-Laws—HORLICK, HAMMOND, NELSON.

CONTENTS

The University of Wisconsin

REPORT OF THE REGENTS

Milwaukee,
December twenty-eight,
Nineteen fourteen.

To His Excellency, FRANCIS E. MCGOVERN,
Governor.

Sir:—I have the honor, in behalf of the Regents of the University, to present herewith their biennial report in detail for the biennial fiscal term 1912–13 and 1913–14.

In accordance with the practice heretofore obtaining, this report is made up of the report of the President of the University, supplemented by the several reports of the Deans of the Colleges, Schools, and Extension Division, and of the Directors of the various courses and departments, and by the reports of other educational officers, and further supplemented by the reports of the Business Manager and of the State Treasurer, *ex-officio* treasurer of the Board of Regents of the University, and is intended to exhibit the progress, conditions, and wants, of the University and other important information relating to the University's work.

Yours very respectfully,
JAMES F. TROTTMAN,
President.

REPORT OF THE PRESIDENT

To the Honorable James F. Trottman,
President of the Regents,
Of The University of Wisconsin.

Sir:

Herewith I submit my report for the biennial period ending June 30, 1914.

As usual the report consists of the following parts:

I. The Progress of the University.

II. The Needs of the University.

Also, in accordance with custom, following my report are reports from the deans and directors of the various colleges, schools, and courses, from the Business Manager, and other officers. My report will be devoted largely to supplementary material rather than to a restatement of these detailed reports. Each of these reports should receive the careful consideration of the Regents.

I. THE PROGRESS OF THE UNIVERSITY

A. GENERAL PROGRESS

The two years of the biennium have been those of expansion in existing schools, colleges, and courses, rather than the establishment of any new organizations. The biennium has been one of rapid growth, in consequence of which there has been a marked increase in the faculty. The changes in the faculty are given in the reports of the deans and directors.

The Faculty

The increase in the faculty is shown by the table below. This table gives the number of the instructional force on University pay and in active service during three years. These qualifica-

tions exclude from the table emeritus professors, occasional lecturers, assistants, men in employ of the state serving the University without compensation, men on leave of absence for one year, men of faculty rank whose duties are purely administrative, members of the Library School staff, whose salaries are not under control of the University, organizers of the Extension Division, and county agricultural representatives.

Men whose appointments were for a period less than one year, men who did not give full time to University work, and men who were on leave of absence for a part year are considered part-time men; hence the fractions to the nearest third. Lecturers, assistants, etc., are not included, since there is no way accurately to compare the numbers of one year with those of another year because of the variable amount of work required of these classes of the force.

	1911–12	1912–13	1913–14
Professors (including Deans and Directors)	79	83	87½
Associate Professors	37½	41⅔	49
Assistant Professors	90⅓	100½	96
	206⅚	225⅙	232½
Instructors	156	171½	190⅔
	362⅚	396⅔	423⅙

The table shows that the increase in number of professors, associate professors, and assistant professors for the biennium was 25⅔, or 12.4 per cent, and that the increase in the number of instructors was 34⅔, or 22.2 per cent.

The percentage of increase in the faculty during the biennium has been very rapid in the College of Agriculture, in home economics, and in extension, since in agriculture and home economics, there have been very rapid increases in the number of students and in extension there has been a large expansion of its work due to the additional funds made available by the legislature.

The Students

At Madison the total number of separate students attending the University, including those in the short courses and in the summer sessions, the year preceding the biennium was 5,748; in 1912–13, 5,970, an increase of 222; in 1913–14, 6,765, an increase of 795. Thus the total growth of the two years was 1,017, or 17.7 per cent.

In extension an increased number has taken correspondence work. During the biennium there were 6,498 new registrations, and during the second year of the biennium there were 8,933 active registrations, representing 7,662 different students.

Improvement in Organization

In the previous biennial report, attention was called to the fact that for every department in which there are large elementary classes, a man of professional rank has been given charge of the work. This plan, first fully in operation two years ago, has during the biennium made the elementary instruction more efficient than ever before.

It has been repeatedly stated that the instruction of the freshmen and sophomores is not given sufficiently careful consideration as compared with the advanced work. The true situation, upon the contrary, is that a closeness of scrutiny and attention is given to the work of the freshmen and sophomores which is not given to and is not necessary for the advanced students.

It is the purpose of the University during the four-year course to carry the student from the stage of dependence to that of independence. The freshman, not understanding methods of independent study, must, at the outset, have his work closely followed up; but in the latter part of the four-year course, the student should have gained capacity to work by himself under general direction. As has been said, the University authorities recognize this principle, and emphasize the supervision of the work done during the first two years and the close following up of the individual students.

The office of Business Manager, created during the previous biennium has proved, as a result of a three years' test, to be a great improvement in organization. The initiation of expenditures must rest with the educational officers of the University, for the larger part of the income of the University goes for educational purposes. Therefore upon the educational officers and especially the President rests the duty of preparing the budget. The material for such budget is of course largely furnished by the deans, directors, and Business Manager. This budget, revised by the Finance Committee of the Regents and finally adopted by the Regents, becomes the basis of the business transactions of the year. The carrying out of these busi-

ness transactions rests with the Business Manager, with the consequence of relieving the educational officers from this duty.

Similarly, in constructional work, the Business Manager has been a great relief to the educational officers. The educational officers must be deeply interested in and give much time to the preparation of the plans for buildings. The plans once adopted, the letting of the contracts and the construction of the building fall exclusively upon the Business Manager under the direction of the Regents.

Although anticipating the next biennium, it may be said that Dr. H. C. Bumpus, who, since the creation of this office has occupied the position of business manager, resigned November 1st to take the position of president of Tufts College.

Student Life

During the biennium, effort has been directed to the improvement of the efficiency of existing organizations having to do with student life. The supervision of the work of the students on the scholastic side rests with the advisers, special provision being made for the freshmen, as described in the biennial report of two years ago. The control of student affairs outside of the class room is in the hands of the students themselves, the Student Conference and the Student Court for the men and the Self Government Association and the Judicial Committee for the women.

The growth of extra curricular activities in the University, as in other universities, has been such as to occasion the serious concern of the faculty. It is believed to be advantageous for each student to participate in student activities, since many of these are educational; indeed I have advised each student to participate in at least one activity, which involves intellectual work, such as debating, dramatics, journalism, and also in one out-of-door sport.

The difficulty which has arisen in connection with extra curricular activities is that a large number of students have failed thus to participate, while a smaller number have participated in so many activities as to interfere with their regular work in the University. In consequence of this situation, the second year of the biennium the faculty appointed a committee to consider the entire question of extra curricular activities. This

committee reported to the faculty and the report after modification was adopted. The central idea of this report is to bring together under the control of a single committee all extra curricular activities so that there may be in one body knowledge of all such activities. Each group of activities is in charge of a sub-committee responsible to the main committee. The chairman of the general committee is to devote a large part of this time to its work, and thus in a measure perform the duties of a dean of men. This plan will be put into operation the coming biennium. It is hoped that it will result in a much wider participation by the students in extra curricular activities and in moderation for those who have been inclined to excess in this regard.

Student Health

During the biennium there has been considerable expansion in the Department of Medicine devoted to student health. This has been possible because a building has become available in which this service has been concentrated. The work of no department of the University is looked upon with more satisfaction than this.

The men and women, on entering the University, are subjected to a thorough medical examination. As a result of this examination, they are classified into three groups and the work in physical education for every student is adapted to the group in which he is placed. Also in case of any indisposition, even if a minor one, because of the opportunity for immediate attention, the student at once receives medical attention. The amount of work involved in the care of student health is shown by the following figures:

During the regular year of 1912–13, the number of consultations was nearly 24,000; and during the Summer Session of 1912, 1,664. In 1913–14, the consultations during the regular sessions were almost 31,300, and for the Summer Session of 1913 over 1,100. The number of individuals involved was for the regular session of 1913, 3,397; for the Summer Session of 1912, 479; for the regular session of 1913–14, 3,685; for the Summer Session of 1913, 423. These figures show that more than half of the students of the University some time during a year take advantage of the opportunities of the Clinical Department.

During the biennium, as heretofore, since the Department of Student Health has been established in no case has there been an epidemic. For the reasons above given there can be no doubt that the general efficiency of the student body is considerably increased by the department. No quantitative figure can be given; but it is safe to say that five per cent increase in effectiveness would be too small and ten per cent perhaps not too large an estimate for this service.

Aside from the general health work various scientific studies are being carried on for the student body as a whole. One of these is the relation of athletics to health. Such studies will have an important bearing upon the general health of the community as well as upon the athletics within the student body. The results of the first completed study on athletics, that on intercollegiate rowing in the University, are now available; they will be mentioned in another connection. (See pp. 278–279.)

Inspection of Rooming Houses

As heretofore, the houses in which the students live are inspected by the Medical Department in regard to their sanitary conditions, special attention being given to ventilation, heating, plumbing, and general cleanliness. This inspection extends also to the fraternity houses. In addition to this inspection, rooming houses occupied by women must be approved by the office of the Dean of Women. The inspection of rooming houses has resulted in great improvement in the living conditions of students in the University during the past two years.

Permanent Improvements

During the biennium there have been larger additions to the physical quarters available to the University than in any previous biennium. Four large educational buildings and an additional women's dormitory have been occupied. In addition to these, several buildings of moderate size have been completed and also various minor structures. These buildings are fully described in the report of the architect.

BIOLOGY BUILDING

For educational purposes the most important building is that for biology. This structure is 240 feet long, 49 feet wide, and

has a floor area of 80,000 square feet, exclusive of greenhouses. It is believed that this building will adequately provide for the Departments of Zoology and Botany, without addition, for a considerable number of years.

WING TO CHEMICAL BUILDING

The chemical building, occupied for the first time in 1906, in less than six years had proved inadequate to meet the needs of the University, and during the biennium a large wing was added at a cost of somewhat more than $72,000. This addition to the Chemistry building should provide adequately for a considerable growth in the University.

AGRICULTURAL CHEMISTRY BUILDING

The third important building is that for Agricultural Chemistry. This work heretofore has been located in central Agricultural Hall. The new building for this purpose has a floor area of 30,000 square feet and has cost somewhat more than $85,000.

HOME ECONOMICS BUILDING

The fourth large building is that for Home Economics and Extension. This has floor area of 50,000 square feet. Home Economics, heretofore located in the attic of Lathrop Hall, now has adequate accommodations. Also the University Extension Division, heretofore located in University Hall, has found appropriate accommodations to carry on its rapidly enlarging work.

BARNARD HALL

Another large building which has been a great acquisition to the University is Barnard Hall, a dormitory for women. This hall is a thoroughly modern structure, built after careful studies of dormitory structures in other institutions. It has rooms for 133 students and in addition dining halls, parlors, and rooms for servants. The occupancy of this building has been of immense assistance in solving the problem of adequate living quarters for the women students of the University.

Other structures of some consequence are as follows:

GYMNASIUM ANNEX

An annex was constructed to the Gymnasium which has a floor area of 17,000 square feet. This annex has somewhat relieved the pressure for space due to the fact that the Gymnasium is used by both the Department of Physical Education and the Department of Military Science, as well as for an auditorium.

STUDENT HEALTH BUILDING

The work of the Department of Clinical Medicine has already been mentioned in connection with student health. The house on the property acquired from Mr. John M. Olin has been enlarged at an expense of $12,000, so as to have a floor area of 8,500 square feet. This well accommodates the work of the department devoted to student health.

WISCONSIN HIGH SCHOOL

Another very important building, nearly completed during the biennium, which will be ready for occupancy at the opening of 1914–15, is the Wisconsin High School. This building has a floor space of 40,000 square feet; it will cost approximately $120,000. As explained in another connection, this building will serve for an observation and practice school for the Course for the Training of Teachers as well as a laboratory for the Department of Education.

WING OF HISTORICAL LIBRARY BUILDING

Another structure, which was not built by the University but which is available for its use, is the northwest wing of the State Historical Library. This wing, mainly devoted to books stacks, carries out the original plan of having the books of the Historical Library in the south stacks and the books of the University Library in the north stacks. The accommodations for the books of the University Library are now adequate. This wing is thus of great advantage to all departments of the University and especially to those of the liberal arts.

SMALLER STRUCTURES

In addition to the above structures, there have been built a number of small buildings and additions to existing buildings. For the College of Agriculture these include a laboratory for the production of hog cholera serum, two hog barns for experimental work, a plant pathology greenhouse adjacent to the horticultural greenhouses, a fireproof book room in Agricultural Hall, and various small buildings at the sub-stations of Ashland, Spooner, and Marshfield. The total cost of these structures for the College of Agriculture was about $29,000.00.

For general purposes there were also constructed an electric sub-station in the central heating plant, at a cost of somewhat more than $900, and a central kitchen to serve Chadbourne, Barnard, and Lathrop Halls, at a cost of about $11,000.

BUILDINGS CONSTRUCTED IN ACCORDANCE WITH GENERAL PLAN

The buildings completed during the biennium conform to the general plan for the constructional development of the University. Those located east of University Hall are faced with Madison sandstone; those between University Hall and Agricultural Hall with yellow brick of the same color as the Madison sandstone with trimmings of Bedford lime stone; and those west of Agricultural Hall with brown brick. This plan places the most expensive structures on the prominent part of the grounds, buildings somewhat less expensive in the intermediate area, and the least expensive buildings on the western part of the grounds. Buildings of all types are of reinforced concrete construction and are fireproof throughout.

The expenditures for new construction by the University during the biennium amounted to $715,547.70.

LAND PURCHASE

In the biennial report of two years ago mention was made of an appropriation of $47,000 a year for five years for the purchase of the Raymer farm and Olin tract, together aggregating 156.15 acres. The legislature of 1913 also made an additional appropriation of $50,900 a year for a period of two years for the purchase of various lots north of University Avenue between

Charter Street and Agricultural Hall, and for the purchase of the eighty-acre Koch farm adjacent to the Hill farm. During the year 1913–14 the first half of this appropriation became available. Also during the biennium there have been payments made upon lots which have been previously purchased in this general neighborhood and which had not been fully paid for. The outstanding debt (Dec. 1, 1914) not due is now $2,000. During the biennium there were spent, for all these lines of land purchase, in 1912–13, $71,402.55; in 1913–14, $142,128.57; a total of $213,531.12.

June 30, 1914, the acreage of land belonging to the University was as follows:—Continuous area from Park Street to Eagle Heights, including Camp Randall, 637.83 acres; the agricultural farm, separated by a short distance from the previous area, 290 acres; northern sub-stations, 482.64 acres; total 1,410.47 acres.

There still remains a considerable number of lots between Charter Street and the agricultural buildings north of University Avenue which it will be necessary to acquire slowly during the years to come as the ground is needed for building purposes; also, some further purchases will need to be made east of Park Street; and, when it comes upon the market, Picnic Point farm should be obtained, the only area lying between the University grounds and the lake. When the lands mentioned are acquired, it may be said that the grounds of the University will be adequate to meet the needs of the University for the indefinite future. None of the plans of the Regents have been wiser than the policy not to allow the city to overlap the University, and steadily to acquire land to the west until an adequate area be secured to meet the probable future needs of the University.

Gifts

The most important gift received by the University during the biennium is a collection of paintings. Professor Paul S. Reinsch, while in Europe, made a collection of one hundred forty paintings, representing the Flemish, Dutch, Italian, Spanish, French, and English schools. Of this collection sixty paintings of the French, Dutch, and Flemish schools, including the well known names of Massys, Rembrandt, Cuyp, Teniers, Hobbema, and Israels, were presented to the University by Mr. Charles R. Crane, of Chicago. Colonel William C. Brumder, of Milwau-

kee, presented seven large paintings from the collection representing the German school. The remainder of the collection is on loan by Professor Reinsch at the University. The collection of paintings has much material which is of great value in teaching the history of art.

During the biennium many other small gifts have come to the University. The list is as follows:

1912–1913

Carnegie Foundation Fund	$8,167.75
Mortar Board Scholarship	100.00
Wm. F. Vilas Medal Fund	200.00
Tarplewick Fellowship (Taylor)	400.00
Scholarship in Physiology (Bradley)	500.00
Henry Strong Scholarship	999.99
Class of 1872 Free Memorial	5.00
Gas Engine Expo. Fund	102.43
Amundson Lecture Fund	270.00
Hollister Pharmacy Fellowship	5,000.00
Class of 1912 Loan Fund	765.00

1913–14

Carnegie Foundation	9,551.63
Vilas Medal Fund	180.00
Gamma Phi Beta Scholarship	200.00
Self-Government Association Scholarship	100.00
Henry Strong Scholarship Fund	1,300.00
Albert Markham Mem. Fellowship	800.00
Class of 1913 Loan Fund	396.48
Menorah Society Prize Fund	200.00
Milwaukee Drug Company Scholarship	35.00
Pure Seed Special	319.51
B. R. Kohn Boat Fund	35.00
Total	$29,627.79

B. THE PROGRESS OF THE COLLEGES

The progress of the colleges is fully covered in the reports of the deans and directors. Therefore the statements which will be made under this heading will be brief.

The College of Letters and Science

During the biennium for the regular sessions, the number of students in the College of Letters and Science has increased from 2,504 in 1911–12 to 2,653 in 1913–14, a growth of 149. The larger part of this increase came the second year of the biennium. However, the amount of teaching work in the college

has been increased to a much greater extent than would appear from these numbers, because of the fact that the increased growth of other colleges also affects the work of the College of Letters and Science, it being estimated that of the teaching to freshmen and sophomores in engineering, agriculture, and home economics, about 60 per cent is done in Letters and Science.

No new departments have been added to the College of Letters and Science during the biennium.

THE COURSE IN CHEMISTRY

There has been little change in the Course in Chemistry. It may be noted that this is one of the courses in which nearly all of the students are men. Of the 77 in 1912–13 and 73 in 1913–14, there were each year four women. The men who have graduated in this course find it easy to secure positions, but the same is not true for the women; and, thus, the Course in Chemistry is analogous to engineering in being a professional course in which to the present time the demands for graduates are almost exclusively for men.

THE COURSE IN COMMERCE

The Course in Commerce since its establishment has had a continuous growth, the number of students each year since its establishment in 1900 being greater than for the previous year. The number increased from 340 in 1911–12 to 396 in 1913–14, a growth of 56. The increase in the number of students in this course is a correlative of the fact; that, for the different lines of business, professional training is now being demanded in increasing degree. Probably not many years will elapse before, for the more important positions in business, it will be recognized that the professional training is as essential as for engineering.

THE COURSE IN JOURNALISM

During the biennium the work in Journalism has continued to grow, the number of students increasing from 67 in 1911–12 to 99 in 1913–14. The importance of this professional course has led to making the work in Journalism a separate department, thus giving it the same position in relation to English that Commerce has to the Department of Political Economy. The quar-

ters of the department have been inadequate in University Hall; and, beginning with 1914–15, the department was located in the third floor of South Hall in the space formerly occupied by the Department of Bacteriology. This transfer gives adequate accommodations for Journalism.

COURSE IN LIBRARY TRAINING

In the Library School, two innovations have been put into force during the biennium. In the training for library service, a system of co-operation with the public libraries has been introduced. These libraries are used as laboratories for February and March of each year. For these two months the work in residence is discontinued, and the students are distributed through the public libraries of the state. There, the students perform the work of regular assistants seven or eight hours a day, six days in the week. This experiment is an interesting one since as in other schools and colleges it has been found that the practice work can only be done in the University to a limited degree and that outside co-operation is advisable. This point is alluded to later. In 1913, 37 libraries co-operated by receiving students for library work and, in 1914, 31 libraries thus co-operated.

In the year 1913–14, there was introduced into the Library School a new course for special training for legislative and municipal reference work and the sociological phases of library service. It is believed that there will be an increasing demand for library graduates with special training in political economy, political science, and sociology, to give expert assistance in gathering material relating to questions of municipal, state, and national government.

COURSE IN PHARMACY

To the Course in Pharmacy, there has been attached a Pharmaceutical Experiment Station, created because of the special appropriation by the legislature of $2,500 per annum for this purpose. This station has been in existence only one year; and, therefore, little can be said regarding its probable contributions to the science of pharmacy; but the action of the legislators was notable in that by special appropriation they deliberately associated investigative work with the teaching of pharmacy and

gave such investigation a special grant. This action of the legislature is significant as recognizing the essential connection between successful teaching and investigation.

THE COURSE FOR THE TRAINING OF TEACHERS

During the biennium, in the Course for the Training of Teachers, comparatively few changes have been actually put in operation; but preparations were made for occupancy of the Wisconsin High School Building. This school, upon taking possession of its new building was reorganized. The requirements for the University teachers certificate have been modified and increased. The details of these changes are fully given in the Reports of the Dean and of the Director of the course.

It may be said that at the beginning of the 1914–16 biennium the Course for the Training of Teachers, which has been developing for ten years, while perhaps not having reached final form, has become an established course upon as permanent a basis as the other courses in the College of Letters and Science.

College of Agriculture

TEACHING

The attendance in the College of Agriculture has grown very rapidly during the biennium, from 609 in 1911–12 to 817 in 1913–14, an increase of 208. The home economics work during the same period has increased from 134 to 205, an increase of 71. With the rapid increase in numbers, the students in agriculture to a larger extent are coming from the cities. Many of such students have had little or no practical farm experience. In consequence of this new situation, it has been decided that, before graduation, students must have at least a full year of practical farm experience. If they have not already had such experience, it must be acquired outside of the University before the degree is granted.

The increase in the expenditures of the college has been due more to the expansion of old lines than to the introduction of new work. During the biennium, however, there was introduced a practical course for forest rangers, the instruction of which is directed to the preparation of men expecting to do rangers work. In connection with this rangers course, woodlot management or

farm forestry has been introduced into the curriculum of the course of the regular students in agriculture.

RESEARCH

As heretofore the College of Agriculture has continued its research work along various lines. A summary of these various researches is given in the accompanying report of the Dean and in a more detailed form in the reports of the Director of the Experiment Station. The wide variety of researches and their many practical relations to agriculture are indicated by the long list of publications, which have been issued during the biennium. (See pp. 101–102).

Perhaps the most important enlargements of the research work during the biennium have been those in plant pathology and the marketing problems. In regard to the latter, while it was natural that the work of the Agricultural College should first be directed to increasing the production of the farm, with the rapid development of agriculture as a science, the business side of farming is becoming more and more important; and, thus, during the biennium there has been co-operation with the state board of public affairs in various studies directed to improving the economy of marketing the products of the farm.

AGRICULTURAL EXTENSION

The third line of work in the College of Agriculture, extension, has grown very rapidly. There has been expansion in old lines of work and additions of new. The county agricultural representative system, started the previous biennium, has been greatly enlarged in consequence of legislative action. Authorization was given to place such representatives in ten counties for the year 1913–14. At the end of the biennium representatives had been established in nine counties. This system, under which an agricultural middleman consults with the farmers individually and in groups to assist them in their work, is to have a far reaching consequence in the rapid application of the science of agriculture to farming. In the winter the agricultural representatives give instruction in agriculture. This instruction, in those counties in which county training schools are organized, is given in these schools.

The general extension work of the college has been carried on much as heretofore. This work, the coming biennium, however, will have large expansion due to the passage of the Smith-Lever bill by Congress, which gives to the State of Wisconsin for the year 1914–15 an appropriation of $10,000, and thereafter annually an increasing amount which may finally reach as large a sum as $100,000.

New lines of extension work, inaugurated during the biennium, were co-operation with the State Bankers Association, the establishment of a special branch of the Wisconsin Experiment Association in the growing of alfalfa, and the development of community centers for potato growing.

Notwithstanding the extent to which the extension work had been carried on by the University, the legislature of 1913 took the initiative in establishing other lines of extension work, the more important of which were provision for distribution of hog cholera serum and for the establishment of a state soils laboratory.

The farmers institutes during the biennium have continued along the same lines as in the previous biennium. The end of the biennium marked twenty years of service as head of the institutes of George McKerrow, at which time he resigned.

College of Engineering

In the College of Engineering the attendance has increased slightly during the biennium, being 678 in 1912–13 and 738 in 1913–14; but both numbers are less than the maximum number that have attended this college. At other colleges of engineering in the country a similar situation exists; and this fact raises the question whether or not in engineering the period of rapid expansion has ended. Because of the astonishing expansion of business, industry and transportation, during the past twenty-five years, the colleges of engineering have had a phenomenal growth. In recent years, however, there has been rapidly introduced concentration in management, which has resulted, among other things, in relatively less demand for engineers. As far as one can see, for a few years to come, the added number of new men required each year for this profession will not be vastly greater than at present. This situation has a bearing upon the future growth of the University. It has sometimes been assumed

that the University would continue to grow during the next decade as rapidly as during the past ten years. Certainly this will not be the case for engineering; and probably the time will come in other departments of the University in which rapid expansion will cease, although no doubt for many subjects this situation will not be reached for a long time.

An important change in the curriculum of the college has been made during the biennium, the details of which are given in the report of the Dean of the college. The most important points in the change were reducing somewhat the amount of work required for graduation, the amount having been found to be excessive, and introducing greater opportunity for election. It is believed that each of these changes will improve the courses by making the students better able to do well the work that is required and by giving more liberal training. It is now recognized that the engineer must be a broadly trained man as well as a technically trained one.

As in the previous biennium, the college has made a number of important contributions to the science of engineering. These relate to many fields. So important has the research work of the College of Engineering become that the regents decided late in the biennium to organize this work as an engineering experiment station.

Medical School

In the Medical School, as heretofore, the first two years only of the course are maintained. The increase in the number of students has continued steadily, in 1911–12 the number being 57 and in 1913–14, 82. The number of students outside of the regular medical school who took work in the school has also increased, especially in embryology, anatomy, and physiology. Anatomy and embryology are elected by students majoring in physical education and in biology. General physiology is also taken by students outside of either of these departments. In consequence of these elections outside of the medical students, the amount of teaching in the school is considerably greater than would be estimated if based upon the medical students alone.

During the biennium, as in previous years, the school has been active in contributing to the advancement of the science of medicine, many papers having been published which are listed in the report of the Dean of the school. (See pp. 156–157.)

During the biennium the administration of the state laboratory of hygiene has been transferred to the Medical School and Dean Bardeen was made its Acting Director.

Law School

The registration in the Law School has increased somewhat, being in 1911–12, 158, and in 1913–14, 169.

During the biennium there have been four important resignations, those of Professors W. U. Moore, W. W. Cook, Elden James, and E. G. Lorenzen. These resignations are closely related to the salaries which have been paid in the Law School. The general question of the loss of men in the University on account of the existing standard of salaries will be discussed on a subsequent page.

One important change in policy has been made. Beginning with the class entering the year 1914–15, practice work will be required of the students in law precisely as in engineering and agriculture. This practice work is to be for a period of six months and is to be done in the various law offices of the state. It is hoped that the better law firms of the state will be willing to co-operate with the Law School in making residence in the law office furnish practical training of value. It is realized that this will perhaps not be so easily attainable as in agriculture and engineering; however, it is believed that the lawyers of the state will be sufficiently interested in the advancement of their profession so that they will give a reasonable number of young men in their offices an opportunity for more than routine work, and thus give them some insight in the essentials which are necessary for the beginning of the practice of law.

Graduate School

The Graduate School has continued its steady growth, the number of students for the regular semesters increasing from 377 in 1911–12 to 437 in 1913–14. Also the number in the Summer Session has greatly increased. The magnitude of the Graduate School has become such that the Regents have decided to create a separate faculty for the Graduate School on the same basis as other faculties and at the head of which there is a dean.

Regarding the scope of the Graduate School and its relation

to the undergraduate school, the statement contained in the general bulletin on the University is here repeated.

The primary purpose of the Graduate School is to give training for those who are expecting to become teachers, investigators, or scholars in their various fields. Its work is a continuation of the advance undergraduate work of the different colleges,—notably letters and science, engineering, and agriculture.

The work of the Graduate School closely connects itself with instruction and with investigation. The fundamentals of the method of producing intellectual leaders have not varied from those of the days of Jesus and Socrates. The Master gathered a group of disciples about him who assisted him in his work and whom he taught. This is essentially the method of the Graduate School. Many of its members assist the professors in their teaching; many assist them in their research work; the professors lead the men to intellectual independence.

The Graduate School is the apex of the University. While in the sense that the number of students in this school is small as compared with those in the undergraduate colleges, and is therefore much less important, in the sense that the Graduate School produces teachers and investigators who are in the future to teach undergraduate students in this and other higher institutions of learning and who are to advance knowledge, the school is of the first importance. Also, the University that has a strong graduate school is an efficient university in undergraduate instruction.

The Summer Session

The Summer Session has during the biennium continued its rapid growth, increasing from 1,537 in 1911 to 2,132 in 1913, a growth of 38 per cent. Not only has the number of students increased but their grade has advanced. In 1913, one third of those present were graduate students. About nine tenths of the entire group were doing work for academic credit, and less than one tenth were unclassified or special students. Correlative with the increase in numbers and grade has been an increase in the number of students who have completed their course at the end of the Summer Session, 65 taking degrees in 1912 and 117 in 1913.

For a number of years the income from the tuition of the Summer Session has approached nearer and nearer to the cash ex-

penditures for that session. In 1913 for the first time the two were almost identical. The expenditures for that year were $32,005 and the receipts $32,017. Thus that year the total cost of the Summer Session to the University is the amount of the deferred salaries for those who are expecting to take leave of absence. This for thirty instructors in 1913 amounts to $10,339. This sum therefore represents the cost not only of maintaining the Summer Session, but of maintaining a very satisfactory leave of absence system.

Physical Education

The very full report of the Director of the Department of Physical Education discusses almost every aspect of the department; I shall here mention a few points merely for the purpose of emphasis.

GENERAL PARTICIPATION IN OUT-OF-DOOR SPORTS

It is the primary purpose of this department to secure general participation by the student body in physical exercises and especially out-of-door games and sports, since this form of physical exercise is most advantageous. There has been steady development of intramural sports, both in the men's and women's division. These sports include bowling, basketball, fencing, hockey, tennis, baseball, archery, volley ball, field, track, rowing, canoeing, cross country running, etc.

INTERCOLLEGIATE ATHLETICS

Intercollegiate athletics should be a natural culmination of the games and sports between colleges and classes within the student body. However, it can hardly be said that this situation has as yet been reached in the University. Intercollegiate athletics, because of their spectacular nature, attract general interest and therefore are overemphasized. This fact has its advantages and disadvantages. Intercollegiate athletics are one of the factors which keep up the relations between the University and the alumni. In other ways also they are an advantage to the University. On the other side the danger of intercollegiate athletics is that they may demand too much time and energy of the students; or, because of their severe nature, may make demands

upon the physique beyond the normal and thus result in detriment of the participant rather than in his benefit.

This problem is one which has attracted the attention of university authorities for many years; and the University has now taken up the problem on a strictly scientific basis. The Medical Department has made an investigation of the influence upon the participants of the severest form of intercollegiate athletics, rowing. This investigation has shown beyond reasonable doubt that under the conditions in which rowing is carried on at The University of Wisconsin, intercollegiate rowing results in enlargement of the heart to a greater or less extent in more than half of those engaged; and, of those who have suffered from hypertrophy, several have had acute dilatation of the heart. The investigation showed conclusively that intercollegiate rowing instead of being an advantage to the students was a disadvantage. When these facts were placed before the faculty and Regents, (See pp. 278) they promptly decided to discontinue this sport; and this conclusion was accepted without protest, indeed with approval, by the student body, because of the indisputable proof presented by the medical department.

It is planned to extend similar studies to the other more severe lines of intercollegiate athletics. This method of handling such a problem rather than that of emotional appeal, cannot but have a far reaching effect upon intercollegiate athletics; for the studies undertaken here are sure to lead to similar studies in other institutions.

PROFESSIONAL COURSES

The students in the newly established professional courses for those who wish to teach physical education, become play leaders, or recreation directors, have increased in number. The students majoring in this course in 1910–11 being 10 and in 1913–14, 33. With the recognition of the importance of out-of-door exercises for all of the proper kind, there is sure to be an increasing demand for teachers in physical education and the professional course was organized to meet this demand.

MILITARY DEPARTMENT

In the Military Department there have been important changes. The first year of the biennium Captain Collin H. Ball was recalled to other duties by the War Department and Lieu-

tenant Philip G. Wrightson was appointed for work in the Military Department here.

Regular courses of lectures are given in military science which may be taken by the students in the department for credit toward graduation, precisely as other scholastic studies.

Other important steps have been made to increase the efficiency of the department, all of which are set forth in the report of the Commandant.

Extension Division

The Extension Division through action by the legislature received an additional increment of $25,000 per year over that of the previous biennium. In consequence of this fact it has been practicable to extend the work of the division. The demands for this work have more than kept pace with the possibilities of expansion.

The Correspondence-study work, which in its final educational effects is perhaps the most important department of the division, has continued rapidly to increase. In 1911–12 there were 6,047 students who took correspondence work; in 1913–14, 7,662; an increase of 25 per cent in the active list for the biennium.

The University has continued the preparation and publication of texts to carry on the correspondence work. Eleven such books have now been published. These books are used not only at The University of Wisconsin, but at a considerable number of other institutions, including some of the more important institutions, such as Massachusetts Institute of Technology, the Universities of Illinois, Kansas, and Minnesota.

The Department of Debating and Public Discussion has continued work along the lines of the previous biennium. Like all other departments of the Extension Division, this work has grown. Mr. F. A. Hutchins, who organized the work, died during the biennium and the department has been continued under the direction of Miss Almere L. Scott.

During the biennium the Department of Instruction by Lectures has greatly expanded its work. It is estimated that during each of the years 1912–13, 50,000 people attended lectures and entertainments given by the staff of the University. In the above figures are not included the large numbers attending lectures under the auspices of the University given by outside organizations.

The Department of General Information and Welfare has continued through the Bureau of Municipal Research, the Civic Center Bureau, the Health Instruction Bureau, the Community Music Bureau, and during the biennium the Bureau of Visual Instruction was added.

During the biennium two additional district centers were organized,—the districts of Superior and Wausau in 1912, and the Eau Claire district in 1913, making in all six districts which are now organized.

Other Branches of University Work

No summary is here made of the reports of the various administrative officers, the work of whose divisions is not instructional. These reports include those of the Dean of Women, the Chairman of the Committee on Accredited Schools and Appointments, the Director of the Washburn Observatory, the Editor the Librarian, the Architect, the Consulting Engineer, and the Business Manager. (See pp. 232, 309, 263, 320, 315, 339, 333, and 323).

II. THE NEEDS OF THE UNIVERSITY

Salaries

The question of salaries has been discussed in the three previous biennial reports; but because of the increased cost of living it is still a pressing one at the University. For five years there has been in force a standard plan for advances of men in the staff whose service is satisfactory. A similar practice is in force in the majority of the other American universities. The salary scale here in force is as follows:

Instructors: first year appointment, $1,000; increase $100 a year to $1,500.

Assistant professors: first appointment for three years, $1,750; second appointment for three years, $2,000.

Associate professors; first two years, $2,250; second two years, $2,500; and third two years and thereafter, $2,750.

Professors: $3,000; after three years, $3,250; after five years, $3,500.

Men whose first regular appointment as full instructor is in

the College of Letters and Science at a salary of $1,000 usually have the degree of Doctor of Philosophy. This means that they have spent in addition to their four years of college work a minimum of three years in advance study. They are men averaging from twenty-five to twenty-eight years old. If a man receives his first appointment at $1,000 when he is twenty-five years old, and is advanced in accordance with the above plan, he will be forty three years old when he receives his first appointment as professor.

This illustration shows how slow the advancement is under the plan in force; and it has not been practicable always to keep the men in the University under the arrangement. In order to hold many of the more capable young men it has been found necessary to advance them faster than the standard rate.

Also since the plan was adopted there has been introduced a higher standard for one class. Those who occupy the leading professorial positions in the larger departments are now receiving salaries of $3,750 and a few have salaries of $4,000; in one instance the salary is $4,500.

Even with these higher rates it has been impracticable to hold a number of our best men. During the last biennium the losses have been especially heavy, namely 7 professors, 3 associate professors, and 16 assistant professors. All of these men we should have been glad to have kept; but they have gone elsewhere because we could not meet the offers of rival institutions. A good illustration of the situation is that in the Law School, where two professors here receiving salaries of $4,000, have gone to other institutions, one at a salary of $4,500 and the other at $5,500.

The loss of high grade men because of the present impracticability of raising our salary scale is indeed a serious matter. The reputation of the University, but far more important, its tone and standards, are primarily dependent upon having in the faculty a considerable number of men of the first rank. If our faculty losses continue during the years to come as rapidly as they have during this biennium, the effect upon the institution will be one which should receive most serious consideration. The loss of three professors in the Law School, two of whose places it has not been practicable to fill permanently as yet, should be made good by securing men of equal ability and experience with

those who have gone elsewhere; even if this involves an increase in the salary scale for that school.

Even if promotions are made in accordance with the very moderate plan now in force, during the next biennium the total salary roll will be increased by a very considerable sum, and this wholly independent of the increase in the number of the staff due to the increasing number of students. The entire cost of increases in the state will be an addition to the amount required for increase in educational salaries.

In order that the mass effect of the increase in salaries during the biennium may appear, there is here inserted a table giving the average salaries for the years 1911–12 and 1913–14 and the percentage of increase.

	1911-12		1913-14		Per cent salary increase
	Number in force	Average salary	Number in force	Average salary	
Professors (including deans and directors)	79	$3,273 73	87½	$3,418 86	4.43
Associate professors	37½	2,312 67	49	2,509 18	8.50
Assistant professors	90⅓	1,835 98	96	1,972 39	7.43
Instructors	156	1,208 71	190⅔	1,278 15	5.74
Average of all *	.....	1,928 28	.....	2,020 80	4.79

* Compiled on same basis as faculty table on p. 2.

There are slight discrepancies between the figures given for 1911–12 and those contained in the biennial report of that year, for the reason that certain part-time men and men in administrative or field work are not included; and also due to the fact that a professor serving on part time is included as a fractional man and his salary included on that basis. In short, the table is worked out with somewhat greater accuracy than in the report of 1911–12.

It will be seen by this table that the increase in the average salary of each class of the force above assistants varies from 4.43 per cent to 8.50 per cent. The larger percentages of increase are for associate and for assistant professors, that is, the men in the intermediate ranks. The average for the entire staff above assistant for the biennium is 4.79 per cent.

The increased cost of the University due to advance in salaries in accordance with the salary scale above given will apply to all of the colleges without respect to increase in the staff.

The added amount due to increase of staff will vary greatly in the different colleges in proportion to the increase in students in those colleges. The increase due to this latter cause will be nothing in the College of Engineering and in the Law School, will be considerable in the College of Letters and Science, and largest in the College of Agriculture and in Home Economics.

College of Letters and Science

The prime necessity of the College of Letters and Science is to maintain an adequate staff of high grade men.

To do this, in a college in which 70 per cent of the teaching of the University is done, will require a considerable addition to the income of the college. This then is the first need of the college.

Second to this is that of additional space to provide adequate lecture rooms, laboratories, and offices for the college. This subject was discussed in full in the previous biennial report of the dean and the president. The essential ideas are repeated in the report of the dean contained herewith. To segregate the different departments in the liberal arts, including the modern humanities, political economy, political science, etc., so that each department shall have a pro-seminary room, in which shall be the home of the students, and to give office space for the staff so that they may work in their offices as do the men in the laboratories, will require very considerable additions to the present space. This is a need of the college, however, which will not require additional appropriations, since the preceding legislature had made the necessary appropriations; but there remains now the construction of the building, the beginning of which has been deferred on account of the condition of the state treasury.

At the earliest time the construction of the Physics building and the addition to the Liberal Arts building, provided for by this appropriation, should be begun.

When the Physics Building and the addition to University Hall are constructed, it will be possible for the men in the languages, literature, mathematics, philosophy, political economy, political science, history, and sociology to have departmental centers and adequate offices for their staff. Until office space is thus provided, it cannot be expected that the members of these

departments shall spend their full days at the University as is expected of the men in the sciences and applied sciences. A man in the laboratory sciences who is not in his building, accessible to the students for from thirty to thirty-five hours a week is not regarded as satisfactory. Similarly, the men in the liberal arts should be at the University at work for a minimum of thirty hours per week; but it is not reasonable to expect this, until such time as each man has adequate office facilities so that he may carry on his preparation for his classes and his scholarly work when not actually engaged in teaching, or in conference with students.

It is proposed to locate the Physics Building on Charter Street, north of the Chemical Building. In the basement and two lower floors of this building the Department of Physics will be placed and in the upper two stories the Departments of Political Economy and Commerce. Thus these departments will be well accommodated.

The effect of this building, however, will extend far beyond the improvements of the condition of these three departments; for the space now occupied by them in other buildings will be available for other departments. The removal of Physics from Science Hall will leave the first two stories of that building free. This space will become available for the various Departments of Medicine and for the Department of Geology. Physiology and Pharmacology, now in the Chemical Engineering Building, will be removed to Science Hall; and thus the medical sciences of the first two years will be well provided for in that building for a number of years.

When the changes take place in Science Hall, this building will require a certain amount of reconstruction, which it is estimated will cost $20,000.

The removal of the Departments of Pharmacology and Physiology from the Chemical Engineering building will release space in that building and thus improve the facilities for Chemical Engineering.

The space now occupied in North and South Halls and in University Hall by Political Economy and Commerce will become available for the remainder of the liberal arts.

This enlargement of the facilities of the college, above outlined, combined with the proposed addition to University Hall, will make possible readjustments in the Departments of English,

Foreign Language, Literature, Mathematics, Education, and Philosophy, so that they will be able to introduce laboratory methods in their instruction, as is done in the sciences.

The building now occupied by the School of Music was constructed for a library and auditorium. At the time of the removal of the University library to the State Historical Library building, the space occupied by the library was adjusted, after a fashion, to meet the needs of the School of Music. However, the building is in a very poor state of repair and there should be rather extensive modifications in it to meet the needs of the School of Music. If this building were reconstructed to adequately meet the needs of the School of Music, the estimated cost would be from $40,000 to $60,000.

If it proves impracticable to reconstruct Music Hall the coming biennium, sufficient readjustments of space and emergency repairs should be made so that the school may decently perform its work. It is estimated the necessary charges will cost about $4,000.

Also the School of Music for its work upon the organ has only a small pipe organ which was second hand fifteen years ago, and it now is in very bad condition. If the Music building is reconstructed, there should be installed a modern instrument of good quality, the cost of which will probably be in the neighborhood of $7,000.

College of Agriculture

The increased cost of the staff of the College of Agriculture, so far as this is due to average increase in salary, has already been covered. This college is the one in which, as has already been noted, the growth has been the most rapid. Therefore, in it there will need to be a considerable increase in the staff during the biennium. A forecast of the particular departments in which this will be necessary is given in the report of the Dean. If this staff is not expanded as the students grow in number, it is certain that the research work of the college will suffer. As has been pointed out in previous reports, it is easy to show that the research work of the College of Agriculture increases the wealth of the state each year far beyond the entire appropriation to the University for that year. Therefore, any

paring of the agricultural staff which would result in decreasing the productive work of the college would result not in gain to the state, but in loss to it from the material point of view alone.

On the constructional side, the most important requirement is a wing to the Horticultural Building to accommodate the Departments of Agronomy and Plant Pathology. The need for this building and its purpose are fully set forth in the report of the Dean. It is estimated that the cost of this building will be $83,000; and the cost of its equipment, $11,000. If this building is provided, the building now occupied by Agronomy will become available for the Department of Economics; and the removal of these departments from the central agricultural building will make available this space for the other departments there located.

Other constructional needs for the Agricultural College at Madison are greenhouses for horticulture, agricultural chemistry, economic entomology, plant pathology, and agronomy, estimated to cost $12,000; an abbatoir, to cost $7,000; farm buildings at Eagle Heights, $4,000; dairy barn extensions, $8,000; wagon shed addition, $3,500; reconstruction of breeding quarters, $3,000; root cellar, $1,000. In addition to the above, small buildings are needed at the branch stations at Ashland, Spooner, and Marshfield, which together are estimated to cost $6,700.

College of Engineering

Since the number of students in engineering has not materially changed for several years, this college has no large requests to make.

Already an appropriation for $50,000 for a shop building has been made. This sum should be spent during the coming two years.

Medical School

A pressing need of the Medical School is for additional space. When the new Physics building is constructed, the necessary room for the Medical Departments now established will be available in Science Hall. Therefore, the only immediate imperative need of the school is that the Physics building be constructed during the next biennium.

It is desirable also that the third year of the medical course

be added as soon as possible. Under the plan which is contemplated, it is expected to retain as much of the regular instruction at Madison as practicable, but also to use the hospital facilities at Milwaukee, particularly for highly specialized subjects.

University Extension

Dean Reber estimates that to provide for the necessary expansions in the work of extension will involve an increment of $25,000 a year for each year of the coming biennium, the same that has been allowed by the state a number of years. This would make the expenditure of the coming biennium over that of the previous biennium for the first year $25,000 and for the second $50,000.

Student Buildings

The need for student buildings for men has been dwelt upon in the four previous biennial reports. The arguments several times presented will not be here repeated. At the last session of the legislature, appropriations of $300,000 were made for a dormitory for men and a commons and union for the men, and $50,000 for the equipment of the same. At the present time it is not expected to ask any increase in these appropriations for the purposes named. The money is available in March, 1915. The contracts should be let for these buildings as soon as the money is available. Even if this be done, it cannot be expected that the buildings will be ready for occupancy until the autumn of 1916.

The only additional appropriation required for student purposes is for a new infirmary. As explained in the previous biennial report, there is no provision at the Madison General Hospital or at the contagious hospital for students who are afflicted with minor contagious diseases, such as mumps, measles, whooping cough, chicken pox, etc. For the general interest of the student body such persons should be promptly isolated. In order that this may be done and the students receive proper treatment, the University should have a satisfactory infirmary. It is estimated that such a building will cost $50,000.

Physical Education

In the previous biennial report, it was stated that provision should be made for a boat and bath house, together to cost $7,500. An appropriation was made by the last legislature for this purpose. Its expenditure has been deferred because of the condition of the state treasury in the year 1913–14. The boating facilities are wholly inadequate; and the women have no bathing facilities whatever; therefore, the expenditure of this $7,500 should be made during the coming biennium.

The most important need of the Department of Physical Education is, however, the construction of a stadium at Camp Randall. The wooden bleachers on the north side of the athletic field, built by the University some years ago, have been condemned as unsafe and have been removed. This will make it necessary for the year 1914–15 to rent seats of the circus type to provide for the necessary games. However, such accommodations are unsatisfactory at best; and, as soon as it is possible, there should be a sufficient part of the permanent stadium constructed to provide for games. While it is wise to rent seats until a permanent solution of the problem can be made, during the next biennium if practicable, we should see the beginning of the structure which is to be the solution for many years to come of seating for athletic games.

It is estimated that to build concrete bleachers, to seat 10,800 persons, to construct a field house within the bleachers, to make a new football field, to do the necessary draining, seeding, and fencing, and to construct a running track, will cost $53,500.

A portion of Camp Randall, or some other part of the University grounds, should be definitely dedicated to the out-of-door sports for the women, and adapted for the purpose. At this area there should be placed a field house, containing necessary dressing rooms and toilet facilities. At the present time the athletic work of the women, other than tennis, is located on the grounds of Memorial Park; and no structure is there available to the women except a tent.

It is estimated that a field house adequate to meet the needs of the women will cost $5,000.

Also there will be economy in putting a filter in the men's gymnasium pool, so that the water may be reused, instead of

every few days pumping in cold water from the lake and heating the same. The cost of such a filter is estimated at $1,500.

Military Department

As has been stated in two previous biennial reports, the Military Department should have a structure at Camp Randall dedicated to its needs. By the placing of drill in the morning hours as well as in the afternoon, the congestion in the Gymnasium has been somewhat reduced; but for the best service the uses of the two are incompatible. For fuller statement reference is made to the report of the Commandant. (See p. 302.)

Central Heating Station

The cost of permanent improvements in the Central Heating Station for the years 1915–16 and 1916–17, in order to provide for the heating of additional buildings, is estimated by the Business Manager at $20,000. For further general purposes the following sums are needed: Electrical generating station, $25,000; alternating current, underground power lines, $3,000; campus lighting, $5,000; changing direct current motors to alternating current, $3,000; chemistry stores shed, $1,500; and service frame building, $1,800.

State Museum

Since the situation in regard to a state museum is unchanged, I repeat what was said two years ago. While this building should be associated with the University and be under its administration, it should be a general museum. It is planned to have such a structure occupy the north side of the quadrangle on University hill. Into this museum should go the general collections of the University, other than those which are necessary for instruction. Also in it should be ample space for art. In short, it is the plan to have this building serve the well known general educational purposes of public museums, not only for the students at the University but for the state at large.

While a museum building is extremely desirable, unless the funds for it can be obtained from private sources, its construction must be postponed.

Summary of New Construction

The appropriations needed for new construction and the proposed distribution of the same during the years 1915–16 and 1916–17 are summarized by the following table:

Budget estimates of items for new construction, biennium 1915–16 and 1916–17

	1915–16.	1916–17.
College of Letters and Science:		
Science Hall remodelling	.....	$20,000
College of Agriculture:		
Plant pathology building	$83,000	.....
Equipment	.....	11,000
Horticultural greenhouse (one each year)	2,000	2,000
Agricultural chemistry and economic entomology greenhouse	2,000	.....
Plant pathology and agronomy. (Three greenhouses)	.....	6,000
Abbatoir	.....	7,000
Farm buildings—Eagle Heights	4,000	.....
Dairy barn extension	8,000	.....
Wagon shed addition	.....	3,500
Re-construction breeding quarters	3,000	.....
Root cellar	.....	1,000
BRANCH STATIONS		
Ashland—Granary, pump house, dairy barn annex, grain sheds, milk house, sewage system	1,200	1,600
Spooner—Forage and stock barn, sewage system, poultry	1,200	1,200
Marshfield—Granary, poultry, sewage system	750	750
Student buildings:		
New infirmary	.....	50,000
Physical Education:		
CAMP RANDALL		
Concrete bleachers, capacity 10,800 persons	13,300	16,700
Field house within same	.....	5,000
Football field, 6½ acres	.....	9,000
Finishing, draining, seeding, fencing	.....	6,500
Running track	.....	3,000
Field house for women	.....	5,000
Gymnasium filter	1,500	.....
General Purposes:		
Utility connections (steam and electric) to proposed dormitories	.....	30,000
Electrical generating station	25,000	.....
Pumping station building and equipment	20,000	.....
Alternating current power lines underground to University Hall and College of Agriculture	3,000	.....
Campus lighting	5,000	.....
Changing part of direct current motors to alternating current	3,000	.....
Chemistry stores shed	1,500	.....
Service frame building	1,800	.....
Total	$179,250	$179,250
	$358,500	

Land

For land during the next biennium, options on three lots in the area west of Charter Street and north of University Avenue, have been obtained, aggregating $27,500.

It is not expected at the present time greatly to extend the purchases east of Park Street; but with references to future expansions of the Historical Library Building, the land north of Langdon Street should be acquired as far as the Young Men's Christian Association Building. At the present time the Raymer property is on the market, and the University has an option on this place at $45,000. During the existence of this option the property is rented to the University. The building is being used temporarily for a student infirmary. This is a very convenient place for such infirmary, since it is directly adjacent to the student health building.

The extension work in Milwaukee is centered in the old Milwaukee Academy. This building has been rented for a period of five years, with an option on the property at $25,000, to September 1, 1915. The option given on this property is at a low figure, the owner desiring that the building be used for educational purposes.

The option expires within a few months after the probable adjournment of the 1915 legislature; and if the property is to be purchased, provision must be made by that legislature.

General Considerations

It has often been remarked that during the past ten years the cost of the University has been much increased. This is true; but the facts presented in this and the four previous biennial reports give an explanation of this increase.

The University is doing vastly more for the state than ever before. The University costs much because it does much for the State.

Oftentimes, however, it is not appreciated how large a part of the income of the University is derived from other sources than the state, nor how large a part of that derived from the state is for general state purposes.

Reasons for increased Cost

Extension: An important factor in the larger cost of the University at the present time is that of extension, there having been available for the operation of this work (including the fees received) during the year 1912–13, $185,000, and 1913–14, $237,380. Ten years ago the only fund available for extension

was the small amount for farmers' institutes, $12,000. Thus the cost of this work during ten years has increased twenty-fold. This expansion has taken place, not for the advantage of the students at Madison, but for the benefit of the state as a whole. It has taken place rapidly because there has been so strong a demand in all parts of the state for expansion of the work. The legislature, responding to the demand, has increased appropriations from year to year until, as already stated, the amount for the second year of the biennium was $237,380.

The Large Capital Account: Another factor which is very important in the increased cost of the University has been the necessity for putting a large sum into capital account during the past decade.

Ten years ago the University was very inadequately housed. During the ten years the students have doubled, and it has been necessary to add greatly to the number of buildings.

Correlative with this increase in buildings, large additions to the apparatus have been necessary; and the library, ten years ago wholly inadequate, has been made reasonably satisfactory. The outlay for books and apparatus during the ten years just past has been large.

Also, ten years ago, the Regents saw that the grounds were far too small to meet the future needs of a great university; and it was appreciated by them that to delay the enlargement of the grounds would result in acquiring land at a very greatly increased cost in the future. Consequently, additional grounds have been purchased to meet the probable future needs of the University.

In consequence of these facts, there have gone into capital account in the ten years from 1904–5 to 1913–14, inclusive, the following sums:

Buildings	$2,328,211.59
Land	509,366.34
Books and apparatus	978,023.92
Total	$3,815,601.85

The entire capital account to the end of 1913–14 is estimated at $5,788,770.50.

The University property, represented by this amount, includes the following:—

The land around Madison, comprises the campus and the Hill

farm, 927.83 acres; and the land at sub-stations, 482.64 acres, aggregating 1,410.47 acres.

The buildings of the University include 36 large buildings, 43 of moderate size, and numerous small buildings. In these buildings and the State Historical Library Building are the books and apparatus of the University.

It is a notable fact that the entire valuation of the buildings of the University to the end of the fiscal year, ending June 30, 1914, amounting to $3,581,606.50, is somewhat more than one-half of the estimated cost of $6,000,000 for the state capitol building; and that the estimated value of the entire physical plant of the University, including buildings and equipment, grounds, library, and apparatus, together aggregating $5,788,770.50 is less than the proposed cost of the capitol building without furniture and equipment.

In making this statement, it is fully realized that the cost of the capitol building is no more than justified for this purpose in a great state, and that the building is being economically constructed; but it is also evident that the University has been economical in the development of its physical property.

In considering the expense of the instruction of students at Madison, the amount of capital account is often included. It is no more just to charge this amount to the cost of current instruction at Madison than it would be to charge the state capitol building, costing $6,000,000, as expenses to the state of the officers and legislators who occupied that building during the ten-year period of its construction. The capitol building is an investment made by the state for scores of years, probably centuries, to come. The capital account of the University is of the same class, since the lands purchased will last forever; and all of the important buildings which have been constructed during the past decade are of a permanent reinforced concrete type; they should endure for hundreds of years.

The Contributions of Students: Of the income of the University a large amount is derived from the students. During the decade the non-resident fees have been increased by the Regents from $30 in Letters and Science and Agriculture, and $40 in Engineering and Pharmacy, to $70 a year, in addition to the incidental fee; and the last legislature made a further increase of these fees to $100 per annum. For 1903–4 the student fees were $112,466.14. For the year 1913–14, there were derived

from student fees $301,172.09; and this sum will be increased by many thousands of dollars next year. Thus the student fees in ten years have increased nearly three fold, or by $188,705.95; and, therefore, to a very considerable extent the increased cost of the University has been borne by the students.

Funds from Business Transactions: A considerable portion of the receipts of the University result from business transactions, such as from the purchase of milk and the sale of butter and cheese. The business transactions on this account amounted for the year 1912–13 to $164,146.97, and for the year 1913–14 to $279,800.81.

Contributions from the Federal Government: Another source of money is the federal government, from which $80,000 a year has been derived for a number of years, and which amount will be increased next year because of the passage of the Smith–Lever extension bill.

Gifts and Interest on Investment: From the interest on the University fund and from gifts considerable amounts of money are obtained. These sums in 1912–13 aggregated $43,119.71, and in 1913–14, $41,184.83.

The report of the Business Manager, p. 323, shows that taking into account the above factors, combined with other smaller ones not mentioned, the cost to the state of the conduct of the University during the regular session for teaching and research at Madison was, for the year 1913–14, $1,075,860.67. Of this a careful estimate shows that there was spent for research work $244,454.83 and for resident instruction for the two semesters $691,433.77. While the number of individual students is much larger, the weighted average attendance for the full two semesters was 4,939. This gives the cost per student to the state of resident instruction for the two regular semesters about $140 per annum. The details leading to this result and the method of arriving at it are explained fully in the report of the Business Manager. (See p. 323.)

The Growth of Ten Years

The growth of the University during the past ten years has been very great; indeed, more rapid than ever before. This is shown not only by the increase in students attending the University, but by the number of degrees granted.

INCREASE IN NUMBER OF STUDENTS

During the past ten years the students attending at Madison have more than doubled. In 1903–4, in all departments of the University the number of students was 3,164; for the year 1913–14 the number was 6,765. As showing the range of the work of the students and the growth of development, the following table is inserted:

Table showing number and distribution of students at beginning and ending of a decade.

	1903–4		1913–14	
Graduate school	115*		437*	
College of Letters and Science		1,325		2,653
Included in the above are the following:				
Course in Commerce	177		396	
Course in Philosophy	65		45	
Course in Journalism			88	
Course in Pharmacy	36		40	
Course in Chemistry			73	
Course in Training of Teachers			387	
College of Engineering		744		738
College of Agriculture		60		1,022
Long Course	60		682	
Middle Course			135	
Home Economics			205	
Medical School				82
Law School		201		169
School of Music		172		95
Wisconsin Library School				43
Total		2,502		4,802
Deducting twice counted		76		116
Net Total, Regular Session		2,426		4,686
Summer Session	401		2,132	
Deducting those who returned in fall	127	273	686	1,446
Additional Enrollment, College of Agriculture		465		633
Short Course	310		450	
Dairy Course	155		155	
Forest Rangers Course			28	
Grand Total		3,164		6,765

*Not carried in total because included in lists below.

Without commenting in detail upon the above table, the following points are noticeable:

First, is the great growth in a decade of the College of Letters and Science, from 1,325 to 2,653. Also in this college the Courses in Journalism, Chemistry, and the Training of Teachers have been organized. However, the greatest change is in the College of Agriculture, the students of which college, meeting the regular requirements for entrance to the University, have increased in numbers from 60 to 1,022. In this college the Mid-

dle Course and the Home Economics Course have been organized. The College of Engineering, with fluctuations, has remained substantially stationary. The Medical School has been organized. The attendance in the Law School has somewhat decreased; but this is explained by the fact that the entrance requirements have been advanced by two years of college work. The number in the School of Music has decreased; but this has been due to the elimination of students not of college grade.

THE NUMBER OF DEGREES GRANTED

But perhaps the most striking evidence of the growth of the University and the importance of its work during the past ten years is furnished by the number who have completed their courses and taken their places in the various communities of the state and the country. The facts in this respect are shown by the number of degrees which have been granted. The table below gives the number of degrees granted by the University since its foundations to ten years ago, for the last five bienniums, and the totals since the foundation of the University to the end of 1913–14.

Table showing number of degrees granted

	From 1854 to June 30, 1904	From July 1, 1904 to June 30, 1914	From 1854 to June 30, 1914
First degree	5,425	5,247	10,672
Master	232	770	1,002
Engineer	61	199	260
Doctor of Public Health	.....	1	1
Doctor of Philosophy	67	189	256
Totals	5,785	6,406	12,191

From this table it appears that the number of degrees granted by the University during the past ten years is 6,406. This is greater than the number granted from the foundation of the University to ten years ago. Since the instructional work is roughly in proportion to the number of degrees granted, it is probable that the absolute quantity of instructional work for the last five bienniums is about equivalent to that which was done throughout the history of the University of 1904.

There is probably no better gauge of the value of the work of

an institution than the number and character of the degrees which have been granted. An examination of the above table shows that the number of first degrees for the past decade is not quite as large as the number for the previous history of the University. For the Master's degree and the professional degree of Engineer, the number in each case is over three times as great for the past ten years as during the previous history of the University. The degree of Doctor of Philosophy is the highest degree in course. It is the one which more than any other represents the stage of development of the University in the advancement of knowledge in the world. It is significant that for this degree also, as well as the other advanced degrees, almost three times as many have been granted during the past ten years as was granted from the foundation of the University until ten years ago.

CONCLUSION

Concluding this report I repeat the conclusion contained in Bulletin 666 of the University published at the end of the biennium.

"In conclusion it may be said that the cost of the University although large, is more than justified by results. The state has been liberal to the University; but the University, in turn, has rendered rich service to the commonwealth. It is safe to say that if the state had been less liberal to the University than it has been in the past, today the state would be poorer in consequence. In short, appropriations by the state for the University have been returned manifold, and will continue to be returned in the future in even larger measure. Can any other investments made by the state show larger dividends even from the material point of view?

"However, it is not from the material point primarily that the University is to be judged. It is the fundamental purpose of the University to train men and women so that they will be powerful factors in the advancement of the commonwealth.

"The College of Letters and Science is the trunk of the University. Until thirty years ago, with the exception of the beginnings of one or two of the professional schools, it constituted the University. Out of this college have grown, as branches,

the various professional schools, some of which have been organized as independent colleges and others of which still remain in the college as definite courses.

"The College of Letters and Science is the college which does the general educational work of the University, both for the students registered in that college and for the students in the professional schools. Also in the College of Letters and Science there have been organized a number of professional courses which in other institutions are usually organized as separate schools and colleges.

"The close relations between the college of liberal arts and the schools of applied knowledge are most fortunate, in that it has given to the students in the vocational schools something of the spirit of that college.

"Until rather recently the law, medicine, and ministry have been regarded, as the only learned professions. Now that engineering, agriculture, home economics, etc., are taught as sciences, they have become professions. These vocations in former times were essentially manual arts. Now that they involve training in the fundamental sciences, the emphasis in these vocations is transferred to mental work. Thus the Babcock test does not simply give material wealth. Because it requires an understanding of scientific methods as applied to dairy products, it gives to the dairymen a broader intellectual life. Similarly, household duties, which of necessity involve endless repetition of the same things, become more interesting when placed on a scientific basis.

"It is the aim of the University not only in its college of liberal arts, but in all its schools of applied knowledge, to give men and women, trained both at Madison and through extension, a broader intellectual horizon. These men and women contribute to the intellectual advancement of the state. They not only increase its wealth, but they turn the wealth into social channels. For the highest social development material prosperity is essential.

"Therefore, while the material annual gain to the state, due to the University, amounts to many millions of dollars, these gains, however large, are subordinate to its work in developing thousands of men and women for service to the state and nation. All materials produced by man are for man. If, then, the University were to add material wealth to the state and neglect her

citizens, it would leave unperformed its most important function. The development of well-trained, efficient, high-minded men must ever be the central purpose of the University. They are indeed the soul among its creations, without which all else is of no avail. Such men are found throughout the state. In no small measure the prestige of Wisconsin among the commonwealths of the United States is due to their work.

CHARLES R. VAN HISE,
President of the University.

REPORT OF THE DEAN OF THE COLLEGE OF LETTERS AND SCIENCE

President Charles R. Van Hise,
The University of Wisconsin.

Dear Sir: I submit herewith my biennial report as Dean of the College of Letters and Science.

CHANGES IN THE FACULTY

The ordinary changes in the faculty, caused by the resignation of its members, especially instructors and assistants, have been numerous, as usual, and many promotions have been made, all of which are stated on another page of this report. Some of the important changes in the permanent staff may be briefly indicated here.

The only death in the faculty that has occurred within the period is that of Emeritus Professor Daniells, who died October 12, 1912. His death was noted in my report for 1910–12.

In 1913 Professor Paul S. Reinsch of the Department of Political Science was appointed Minister to China and was granted leave of absence to accept this position. His return to academic work is doubtful.

In 1911 Professor John R. Commons was appointed member of the Wisconsin Industrial Commission for the term of two years, and during that period was able to carry but little teaching. In 1913 he declined a reappointment on the Commission and resumed full academic work.

Mr. Thomas Wood Stevens, appointed Lecturer in Art in 1912, resigned at the close of the year to accept a position in Pittsburgh. His place has not yet been filled, although a successor is greatly needed.

Associate Professor R. L. Lyman, first appointed in 1905 and since 1906 in charge of public speaking, resigned in 1913 and was succeeded by Associate Professor J. M. O'Neill, formerly Assistant Professor of Public Speaking in Dartmouth.

In the same year two appointments were made in this college, jointly with the Extension Department: Professor P. W. Dykema in the School of Music and Associate Professor J. L. Gillin in the Department of Sociology.

Professor L. A. Coerne, since 1910 Director of the School of Music, resigned in 1914, and was succeeded by Dr. Charles H. Mills, formerly Director of Music at the University of Illinois.

Associate Professor H. L. McBain of the Department of Political Science, resigned in 1913 to accept a position in Columbia University. In 1914 Dr. F. A. Ogg, Professor of History in Simmons College, was appointed Associate Professor of Political Science and enters on his duties with the year 1914–15.

Professor M. P. Ravenel, since 1907 Professor of Bacteriology, resigned in 1914 to accept a position in the University of Missouri.

Number of Students

The number of students registered during the period covered by this report is as follows:

	1911-12	1912-13	1913-14
Graduate	300	302	334
Undergraduate	2,204	2,226	2,319
	2,504	2,528	2,653

The college received a great increase in numbers in 1910–11 when 231 students were added to its enrollment. For the next two years the number of undergraduates remained almost stationary, increasing only from 2,204 to 2,226. A new increase came in the fall of 1913, when the freshman class was larger by 147 than its predecessor. The increase in the undergraduate body was not so great, since the senior class was smaller than that of 1913. The freshman class of 1914 is but little larger than its predecessor, but the University increased by more than 400 students and the college is larger by more than 200 stu-

dents than in the preceding year. This increase is larger than any that the college has received since 1910.

In my last biennial report I expressed the belief that the future increase of the college would be slow, especially in the lower classes. The history of the past two years seems to show rather the futility of prediction than to confirm my opinion.

PROGRESS OF THE COLLEGE

In my report for 1908–10, I mentioned an experiment tried by the college, allowing the substitution of the thesis course for the thesis which is regularly required from seniors, and in the following report I gave statistics of the result of this experiment. I continue these statistics for the two years covered by this report.

	1913			1914		
	Majors	Theses	Thesis Courses	Majors	Theses	Thesis Courses
English	98	52	46	123	75	48
German	30	15	15	24	10	14
French	8	1	7	8	2	6
Latin	18	6	12	19	13	6
Mathematics	14	14	0	7	0	7
	168	88	80	181	100	81

In the four language departments the percentage of thesis course students has been as follows: 1911, 23 per cent; 1912, 39 per cent; 1913, 52 per cent; 1914, 42 per cent.

In 1911 the Department of History reported one student in the thesis course, and botany had one in 1912. No such reports were received for the later years. The only significant new movement during the biennium was in the Department of Mathematics, where all of the students taking their senior thesis in that subject were placed in a thesis course. This was probably rather a change in the form than in the substance of their work. The thesis course seems to have established itself in the language departments, and there about one-half of the students are likely to take such courses. In other departments, except mathematics, practically no use has been made of the privilege.

The Department of English reports that some six students in thesis courses turned in a regular thesis as the result of their work instead of the several papers and topics permitted in the course. It is not unlikely that this will be the case of an increasing number of the abler students who enroll for the thesis course. On the whole, the arrangement is proving a useful addition to the work of senior year.

The most important matters in the development of the college are the completion of the Biology Building and of the Wisconsin High School. The first named building was occupied in the fall of 1912 as was stated in my report for 1910–12. It has proved a very successful building in its interior arrangement. The large entrance hall which is intended for a museum, has net as yet been equipped with cases and specimens. A few of the old museum cases from Science Hall have been brought in, but they are far too few to occupy the space or to contain an adequate student collection of plants and animals. This should be provided as soon as funds will permit.

The removal of Botany and Zoology from Science Hall has greatly relieved all departments in that building except Physics.

The Biology Building is perhaps the only one which we have built in recent years, on a scale planned to provide for future growth of the college. It was hoped that the building would be amply large enough to take care of as much as five years' growth; but as present appearances indicate, many of the laboratories will be over-crowded before this time limit is reached.

In 1914 the Department of Bacteriology was divided. General Bacteriology is now placed in the laboratories of the College of Agriculture and Medical Bacteriology has been placed in Science Hall in charge of the Medical School. This change was made because the enlargement of the laboratories of the College of Agriculture permitted the transfer of the general course to that building. The space in South Hall vacated by Bacteriology has been in a great part assigned to the Department of Journalism, thus giving some slight relief to the congestion of University Hall. Most of the remaining space has been given to the use of the Hygienic Laboratory which now occupies the entire upper floor of South Hall. The completion of the building for Home Economics and the University Extension Division in 1914 was followed by the removal from Univer-

sity Hall of the offices of the Extension Division. Thus another small relief was given to the over-crowded condition of University Hall.

In the last report I noted the establishment of the Carl Schurz Memorial Professorship. The first incumbent of the position was Professor Eugen Kühnemann of the University of Breslau. He lectured on German Literature, speaking both in German and in English, during the first semester of 1912–13 and reached great success. The University could not wish for a more auspicious beginning for an enterprise that promises great intellectual profit and inspiration.

Prof. George Edward Woodberry was present during the second semester of 1913–14 as special lecturer on English Literature. His lectures were widely successful, attracting and holding large audiences. Still better, he exerted a great influence on the students, stimulating their interest in letters and guiding them to an intelligent love of literature.

The most important change of the biennium is intimately associated with the completion of the building of the Wisconsin-High School which was occupied for the first time with the opening of the year 1914–15. This building gives at once a laboratory and a center for the work of the Course for the Training of Teachers and its completion marks an important point in the development of that course.

In my report for 1902–04 I stated that the most imperative need of the college was an enlarged income. In the report for 1904–06 when the income of the college had been increased, the two important matters discussed were, the Medical School (authorized by the legislature of 1907) and the course for the Training Teachers. The appointment out of which the Medical School came was that of Dr. Bardeen as Professor of Anatomy in 1904. In a similar sense the appointment of Professor Elliott in 1905 was significant for the Course for the Training of Teachers. The necessary development of the Medical School has removed it from the College of Letters and Science in which the pre-medical course grew up. The teachers' course has remained as the enterprise of the college to which it has devoted a very large share of the funds available for its enlargement.

These two projects were fully discussed with the legislature of 1907 which authorized the Medical School. The University

authorities then promised that if the Medical School was established the training of teachers would be well cared for and developed as rapidly as possible.

The Course for the Training of Teachers first appeared in the budget for 1908–09 with an appropriation of $5,000 besides $8,600 for the Department of Education, which is intimately associated with the work of the course. These appropriations have steadily grown and in the budget for 1914–15 the sums appropriated were, for training of teachers, $17,216.66; Wisconsin High School $21,850 (salaries and educational expenses); Department of Education $14,875. The total is more than four times that appropriated six years earlier and to it must be added the increased cost of departmental courses for training teachers and the adminisration of the Wisconsin High School. The high school building has cost about $110,000. The University has therefore kept its word in regard to caring for this enterprise, so important to the secondary education of the state.

The educational policy which should underlie this course has proved one of the most difficult problems which the college has had to face and no doubt there has been more thought and more discussion expended upon it, than upon any other single question during the past few years. Some of the difficulties attending it were discussed in my biennial report for 1908–10 and need not be repeated here. They may be summed up briefly in the apt words, "Teaching in secondary schools is not so much of a profession, as a procession". The fundamental question has been this, "Shall the University demand that all persons, who are to receive teacher's certificates, must convert their college course into a professional course or shall it permit them to adjust this course in large measure for the forty or more years of life which will follow the three or four probable years of teaching?" The question as stated in this way can receive but one answer. On the other hand there is a well grounded demand on the part of the schools for better prepared teachers; and the schools are more insistent in calling for early professional preparation just because the service of the average teacher is brief and the school can not afford the time for training.

On the whole the college has followed the policy of giving what seems an adequate professional training for teaching without converting the four years into a professional course. The

earlier adjustment of the Course for the Training of Teachers was necessarily experimental and was conditioned by the equipment of the college as well as by many other matters. The completion of the Wisconsin High School gave at once the opportunity and the necessity for readjustment.

As was expected the question of readjustment developed wide divergence of opinion in the faculty but the following program was adopted to go into effect at the beginning of the year 1914–15.

UNIVERSITY TEACHERS CERTIFICATE

For Students Graduating after January 1, 1916

A. The requirements for the University Teachers Certificate shall consist, in addition to the work done in the major and minor subjects, of the following credits:

	Maximum	*Minimum*
Philosophy I (Psychology)	3 cr.	3 cr.
Education	12 cr.	12 cr.
Departmental Teachers Course (Major)	4 cr.	2 cr.
Departmental Teachers Course (Minor)	2 cr.	....
Total	21 cr.	17 cr.

The maximum requirements of four credits for the departmental teachers course in the major subject, and of two credits for the departmental teachers course in the minor subject are at the option of the department. The minimum of two credits in the departmental teachers course of the major must be secured by *all* students.

The requirement in Education is subject to the following conditions:

(1) A minimum of *twelve* credits in Education is required.*

(2) These twelve required credits are to be distributed as follows:
  (a) Educational Practice (Education A) ..... 2 credits
  (b) Elementary courses (see note 4 below) ..... 8 credits
  (c) Advanced course (see note 5 below) ..... 2 credits

(3) The course in Educational Practice (Education A) is required of all students. Graduates of state normal schools and teachers of experience may, however, upon the presentation of satisfactory evidence of teaching ability, be exempted from this requirement by special action of the Department of Education.

(4) The eight credits in elementary courses in Education must be acquired from courses 1, 6, 11, 41. This requirement may be fulfilled by taking each of the elementary courses for two credits, or by taking two of the courses for three credits each, and one course for two credits. Normal school graduates do not fulfill this requirement (see note 6).

* Except for normal school graduates; see notes 3, 4, and 6.

(5) The two credits in an advanced course in Education must be acquired from one of the following courses: 102, 103, 104a, 104b, 112, 113, 144.

(6) Graduates of state normal schools fulfilling the requirements for the University Teachers Certificate must present a minimum of six credits from advanced courses in Education.

B. Candidates for the University Teachers Certificate must secure *eight* credits in addition to the one hundred and twenty credits required for the Bachelor's degree; and for such certificate the normal residence requirement is one summer session in addition to the regular residence requirement.

This additional summer session may not be taken earlier than the close of the sophomore year.

Students of ability, allowed under the general regulations to take more than the regular amount of work, may be permitted by the Committee on the Training of Teachers to acquire the eight extra credits without attendance upon the additional summer session.

The privilege of receiving the University Teachers Certificate in four years without a summer session will be granted only to students of approved ability. Such students may apply to the Committee on the Training of Teachers for this privilege during the second semester of their junior year, stating the courses they have completed, with their standings therein.

C. The following order and arrangement in the fulfillment of the above special requirements as approved by the Committee on the Training of Teachers are to be regarded as normal and are recommended to the attention of students and advisers.

(1) Before the end of the second semester of the junior year credit in Philosophy I (three credits) and not less than *four* credits in elementary courses in Education should be acquired.

(2) The six credits to be earned by summer session attendance should be divided between the major subject, and Education (elementary or advanced).

(3) During the first semester of the senior year credit in the departmental teachers course of the major, and at least *one* credit in Education A (Educational Practice) should be acquired.

(4) During the second semester of the senior year credit in the departmental teachers course of the selected minor or minors and the remaining credit in Education A (Educational Practice) should be acquired.

The principal effects of these changes are as follows: 1. To increase the amount required in the Department of Education from seven credits to twelve. 2. To permit the department in which the major study is taken to require four credits in the teachers' course. 3. To require candidates for the teachers' certificates to gain eight credits in addition to the one hundred and

twenty required for a Bachelor's degree. 4. To add a summer session to the normal period of residence for those who desire the teacher's certificate.

In requiring additional credits and residence for the teacher's certificate, the course assumes a more professional character. The aim of the faculty was to add such professional work as was necessary for the teacher without unduly cutting into the time already devoted to academic work.

Thus the course for the training of teachers, as reorganized and provided with a building, enters on a new period of its life with the close of the time covered by this report. The course as modified by faculty discussions and adjustment is now to undergo the test which experience and time will bring. These will doubtless modify it in detail, but I believe the general plan will prove sound.

During the past few years several writers have investigated the distribution of work of the students of the colleges. The most complete study was that made by Dean Ferry of Williams College, printed in his report for 1913. To this study were contributed statistics from Wisconsin which had been compiled by myself and which while correct in general, did not pretend to great accuracy. During the past months a careful study of this subject has been made in the office of the Business Manager and in the immediate charge of Associate Professor E. B. Skinner. The following table shows the result stated in semester hours or credits. By this term is meant the amount of credit toward graduation made by a student who recites once a week for a semester. A class of twenty-five students reciting three times a week for a semester would count seventy-five credits for the department. A class of sixty students meeting five times a week for a semester would give three hundred semester hours. In the table the semester hours for the two semesters are added together. The hours for the first semester are the larger for the college since the attendance is larger in the first half of the year. The ratio of credits differs greatly for the various departments, but in the college as a whole the first semester is to the second about in the ratio of 54:46.

TABLE I.

	Number of credits, College of Letters and Science, 1908-1913						Percentage of credits 1908-1913	
	1908	1909	1910	1911	1912	1913	1908-1913	
							%	%
Astronomy	87	71	81	70	78	79	0.1	0.1
Bacteriology	677	969	1,206	1,606	1,608	1,491	1.7	1.0
Botany	1,379	2,118	2,207	2,424	2,653	3,530	3.8	2.0
Chemistry	6,800	6,859	8,135	8,895	9,903	10,908	11.7	10.0
Education	1,839	1,878	1,879	1,714	2,130	2,173	2.7	2.3
English	8,968	10,746	12,087	11,900	11,386	13,119	13.2	14.1
Geology	2,593	2,886	3,008	3,389	3,626	3,219	3.4	3.8
German	8,562	9,369	11,093	9,960	10,043	10,256	12.5	10.9
Greek	465	422	375	426	327	258	0.7	0.3
Hebrew	179	243	237	232	223	135	0.3	0.1
History	4,564	5,193	6,358	7,411	7,436	7,827	6.7	8.4
Journalism	.....	304	385	403	546	635	.....	0.7
Latin	2,287	1,831	1,988	1,798	1,292	1,302	3.4	1.4
Manual Arts	.....	.....	102	246	448	609	.....	0.8
Mathematics	7,896	7,027	7,351	6,362	6,954	7,264	11.4	7.8
Meteorology	40	45	68	84	75	61	0.1	0.1
Pharmacy	485	641	1,120	705	765	523	0.7	0.6
Philosophy	1,316	1,803	2,799	2,934	2,692	3,085	1.9	3.2
Physics	4,381	4,353	4,774	4,644	4,579	5,075	6.4	5.4
Pol. Economy	5,246	5,655	5,736	6,292	8,649	8,710	7.7	9.3
Pol. Science	2,050	2,735	3,085	2,123	2,146	1,740	3.0	1.9
Public Speaking	852	852	800	594	944	985	1.2	1.1
Romance Languages	6,555	7,788	7,429	7,929	7,560	7,840	9.6	8.4
Scandinavian Languages	390	568	451	393	415	352	0.6	0.4
Zoology	686	726	734	1,282	1,307	1,961	1.0	2.0
	68,317	75,682	83,488	83,815	87,785	93,087		

The table shows that the amount of the teaching done in the college increased more than 36 per cent during the five years for which statistics are given. Nearly three-fourths of the teaching done by the University is in the College of Letters and Science.

The relative changes in the several departments during the five-year period are more clearly shown by the changes in the percentage of the teaching done than by the number of semester hours. Yet it must be added that no wide range of conclusions should be drawn from these statistics. A growing college in a changing community alters in ways quite other than through the changing intellectual tastes of the students. Changes in required studies, in the number of hours demanded in elementary courses, in the number of freshmen students, in the courses of study in the other colleges of the University and in the number of their students—all these are more effective numerically than are intellectual tastes. A large or a small freshman class at once affects the registration in English, as is illustrated in one way in 1912 and in the other way in 1913. In 1912 Political

Economy increased its elementary course from three to four credits and at the same time the Commerce Course was growing rapidly. Mathematics have been affected unfavorably of late by the stationary condition of the College of Engineering and by changes in the required mathematics in the College of Agriculture. Many similar statements would have to be made if the alterations in the semester hour percentages were closely analyzed.

Dean Ferry grouped the several departments into three divisions: I. Foreign languages. II. English, philosophy, economics, government, etc. III. Mathematics and science. The percentile results for Wisconsin, thus arranged, are shown in the following table:

PERCENTAGE OF STUDENT CREDITS IN THE SEVERAL GROUPS OF DEPARTMENTS.

	1908	1913
Division I.	27.1	21.5
Division II.	36.4	41.8
Division III.	36.5	36.6

The table shows that during the five-year period the relative amount in teaching of science and mathematics remained almost unchanged. There was a relative decline in the foreign languages and an increase in division II. This increase was greatest in philosophy and education; much less relatively in the modern humanities and English. These changes are what would be expected from the rapid growth and development of the Course for the Training of Teachers and the marked increase of the Commerce Course. The development of the Course for the Training of Teachers increases the relative amount of teaching in education but does not increase in a similar way that of the departments in which the graduates will teach, since in any case they would probably have elected their major study in these departments.

In this classification division II appears to be a somewhat heterogeneous assemblage. It may well be subdivided into three sections: A. history, economics, government; B. philosophy, education; C. English, public speaking, journalism. Division III may also be subdivided into: A. mathematics; B. sciences.

If the percentile distribution of teaching in the College of Letters and Science is grouped according to this classification and the study is extended back to certain years, the following approximate results appear.

PERCENTAGE OF STUDENT CREDITS IN VARIOUS GROUPS OF DEPARTMENTS.

	1886	1893	1903	1908	1913
Division I	27.9	25.9	26.7	27.1	21.5
Division II A	13.3	16.4	16.2	17.4	19.6
Division II B	7.7	7.1	4.2	4.6	6.3
Division II C	14.3	14.2	14.9	14.3	15.9
Division III A	11.7	9.9	13.5	11.4	7.8
Division III B	24.3	26.4	23.5	25.1	28.8

In this table the uniformity of the numbers from decade to decade is far more striking than their differences. Such uniformity, however, must not be made the basis of conclusions wider than it will support. In the present case it must be said that not all of this apparent uniformity is real. The College of Letters and Science teaches English, foreign languages, mathematics, and pure science for all the students of the University. The amount of teaching thus done in 1886 was small, since nine-tenths of the students considered in the table were in the College of Letters and Science, and the amount of teaching in the other colleges would hardly exceed five per cent of the total teaching of the University. In 1913 the teaching for other colleges was probably from 15 per cent to 20 per cent of the work of the college, and the teaching in those colleges was about 27 per cent of the total in the University. Thus, if the basis for computation were the number of credits gained by the students of the College of Letters and Science alone, the figures for 1886 would be little modified. If the students from other colleges were excluded, all of the percentages of 1913 would be reduced except history, etc., and this would be much increased since very few students from engineering or agriculture are in these classes. If the base were widened so as to include the entire teaching of the University, the numbers in 1886 would show only a slight change, while those for 1913 would be smaller by nearly 30 per cent than the table gives them, since in that year the College of

Letters and Science gave a little less than three-fourths of the credits given by the colleges named.

It is a point of some interest that the quantity of teaching done by the college in 1893 was probably more than twice as great as that of a decade earlier. In 1903 the credits had again about doubled and in 1913 about 90 per cent had been added to the number given in 1903. Thus, the last decade showed an increase decidedly smaller than the preceding. It is by no means probable that the next decade will show an equal increase, even if the organization of the college remains the same.

I submit with my report the reports of the directors of the several courses associated with the College of Letters and Science. No matters contained in them seem to call for extended comment. They present the condition and the needs of these important branches of the college.

Four of the courses—Chemistry, Pharmacy, Training of Teachers, and Journalism—have received new quarters or enlargement of old ones during the biennium. The courses in Commerce and Music are both in very inadequate quarters, and it is hard to say which is worse off. The construction of the Physics Building is expected to provide suitable quarters for Commerce, and the case of quarters for Music must be left to the future. Its present building has been occupied for this purpose for about fourteen years. It was the former library and is unsuited for the purposes of music, both by its plan and its original construction. A wholly new building is needed, adapted for the special purposes of music, and the present music building should be turned over to other departments.

The Needs of the College

In the last biennial report I presented the prime need of the college—that for additional space. The reasons may be briefly summed up as follows: Additional space is needed: 1. To provide recitation rooms and laboratories for the increasing number of students. 2. To provide numerous additional offices for the faculty. 3. To provide space for improved methods of teaching, especially in history, political economy, political science, and English. 4. To allow the assignment of connected space to departments so that the departments of the humanities

may have a home in the same sense that science departments find a home in the laboratories.

I do not propose to argue this question again in full. The time has passed when any one believes that a teacher of language, history, or mathematics needs only a recitation room and a peg on which to hang his hat. Much of the success of the sciences as a means of education has come from the space which they have demanded and received. The possession of a home for the department has developed a corresponding spirit in the faculty and in the students. The advance students and the teachers of the sciences spend the working day in the laboratory in close association with each other. Thus there arises a common intellectual interest and a common feeling toward the subject, which can come only out of personal association and daily work and which can not be equally developed in the more formal atmosphere of the class room. The elementary student who enters the laboratory comes into the influence of the common work and common interest and this has greatly aided in making effective the teaching of the sciences. It is the hope of the University that in time space may be available so that there may be the same opportunity for the students of the humanities as for those in the sciences.

If these needs are met, each department will have a connected space which will be its home, in which teachers and any advanced students will spend the working day, and which the whole University will associate with the department. Mathematics or philosophy will have a home; not merely an equity in certain benches; and in this respect they will be on the same footing as the departments of bacteriology and soils.

These purposes have been before the college for many years and with them has developed another purpose which has been growing more distinct and for a good while has been equally definite. This is the matter of the need of space in which elementary students in subjects which demand somewhat wide reading may do their work under guidance. The proper use and interpretation of books ought to be taught in much the same way as the proper use of apparatus and the interpretation of the results of experiments. This teaching can not be done in the Library, invaluable as is the Library for the departments of the humanities. The elementary students are too nu-

merous and too little trained to make it possible that the Library should be open to them without restriction, and there is no space in the building where proper guidance can be supplied.

It need not be pointed out that this aim of the college to provide the best possible education is inconsistent with the most economical use of space. If the departments are to be provided with a home, there will be a use of space less than that which maximum efficiency would demand. The same statement is true for the home of a family; and no home can be made what a home should be if it furnishes to each member of the family only the minimum space which hygienic considerations demand. If the home atmosphere is to be created, it must be paid for in space as well as in other ways, but no wise head of a family will grudge this space. The experience of the University has been that the State has been equally wise in providing for the needs of the University.

It is undoubtedly true that some saving of space might be made by scattering the recitations of a department, the English Department for instance, and sending the instructors over the campus to various buildings wherever vacant rooms may be found. If the same policy were followed for a considerable number of departments a good deal of space might be saved, but this saving would be made at the expense of the departments; and English treated in this way would be permanently weakened in spirit and would become inferior to chemistry, bacteriology, or any other laboratory department. This conclusion is not merely a matter of opinion, it has forced itself upon us by the observation of the results of teaching in the different lines of work done by the college. It has been hoped the various provisions of space made for the humanities in the past year would permit the department in some measure to carry out the policies. The building of the University Library, the various enlargements of University Hall, the gradual giving up by the sciences of North and South Halls, were all intended as steps in this direction, but the increase of students, the increase of administrative offices necessarily associated with this, the starting of new enterprises, like University Extension, have defeated this purpose and have left these departments in a situation little or no better than before, so far as undergraduate work is concerned.

The need for additional space was presented to the legislature of 1913 with the result that there was authorized an addition to University Hall and also a second building which was devoted by the Regents, primarily to the Department of Physics and which will also house Political Economy and Commerce. The effect of these additions upon the college will be as follows: The Department of Physics will have adequate space instead of its present over-crowded quarters; Political Economy and Commerce will find in the same building a home in which their work can be properly done; the removal of Commerce from South Hall a similar opportunity for the department of German. The addition to University Hall with the space in South Hall set free by the removal of Political Economy will permit a similar though less complete readjustment of space and improvement in conditions for the departments in University Hall.

These additions will provide the students of the humanities with space which is less than is needed by students of science and less than is given to them but which will meet the more pressing needs of the college and will give opportunity for much improvement in teaching.

There are many other matters which the college needs. In former reports I have mentioned a museum, a larger sum for books, an adequate fund for publishing and research. There is always danger that such matters as these will be neglected in the pressure of need for providing adequate elementary instruction. Much might be said in regard to them and to other similar matters, but the need for space is at present so great and is so definitely the foundation for meeting successfully the intellectual tasks of the college that I prefer not to press these or other topics until this first necessity has been met.

Respectfully submitted,

E. A. BIRGE,

Dean, College of Letters and Science.

REPORT OF THE DIRECTOR OF THE COURSE IN COMMERCE

Dean E. A. Birge,
College of Letters and Science.

Dear Sir: I submit, herewith, my report as Director of the Course in Commerce for the biennial period, 1912–1914.

The number of students registered in the course in the year 1912–13 was 335 and in that of 1913–14, 396. The following table indicates the total registration for each year since the course was established together with the distribution of those totals among the various classes:

Year	Senior	Junior	Sopho-more	Fresh-man	Special	Degrees Conferred	Total
1900-01	0	2	17	62	4	.....	85
1901-02	3	9	35	50	5	2	102
1902-03	8	25	42	63	9	8	147
1903-4	22	25	47	71	8	19	173
1904-05	20	30	57	99	13	14	219
1905-06	22	38	73	83	9	25	225
1906-07	30	35	61	69	5	24	200
1907-08	28	44	59	86	5	25	222
1908-09	27	38	50	91	10	27	216
1909-10	33	36	69	95	4	31	237
1910-11	24	57	79	136	15	23	311
1911-12	43	56	108	119	1	43	327
1912-13	44	81	76	127	7	30	335
1913-14	66	59	82	183	6	49	396

The number of students from other states and foreign countries during each of the years, 1912–13 and 1913–14 was 30 per cent of the total. The average percentage for the preceding twelve years being 21¾, varying from a minimum of 16 in 1901–02 to a maximum of 28 in 1911–12. The number of states represented in 1912–13 was 24 and in 1913–14, 22.

No changes of great importance either in the staff of instruction or in the curriculum have been made during the period under review. Minor changes, however, have occurred. On account of the graduation of some of its members, it has been necessary each year to make changes in the staff of student assistants in accounting, and for the same reason last year the assistant in commercial law was changed. There are disadvantages in such changes and we desire, so far as possible, to avoid them in the future by adding a permanent member to our accounting staff who will do a part of the work now assigned to these students. Our ability to make such an addition, however, will depend upon the size of our budget and upon the discovery of a suitable man for the place. In the recommendations of student assistants made for next year we have had this matter in mind and we hope that one of the persons recommended may prove to be the right man for the place.

Changes have also taken place in the personnel of the staff in the foreign language departments. These also should be avoided whenever possible. The work of adapting foreign language courses to the needs of business men is difficult and its successful accomplishment demands continuity of effort and careful, continuous study of the problem. The assignment of new and inexperienced men to this task interferes with such continuity and such study. I am glad to be able to say that the departments in question are cordially co-operating with me in the endeavor to reduce this difficulty to a minimum.

The course in English history for commerce students during this biennium has been put in the charge of Mr. Byrne, thus reducing the size of the large class which Professor Dennis formerly conducted and making it possible to give attention to the special needs of the commerce group.

The curriculum changes have consisted in the modification of the contents of courses rather than in the introduction of new ones. Certain of our courses, notably those in accounting and business administration, have been considerably modified, partly by the introduction of new matter, partly by the rearrangement of material and partly by omissions to avoid du-

plication of portions of courses given under other heads or to permit the substitution of more for less important things.

Certain further modifications of the curriculum are desirable and should receive attention in the immediate future. The elementary course in political economy which commerce students now take is the first semester of a year's course planned primarily for students who have not previously pursued any studies in the field of political economy and who may not have opportunity to pursue the subject further. Precedent to taking this course, however, commerce students have had a semester's course in commercial geography. Accompanying it they take a second semester course in commercial geography and after it they take special courses in money and banking, transportation, accounting, etc. Obviously their needs are peculiar and a special elementary course adapted to them should be provided.

Much the same may be said of the course in corporation finance. Commerce students approach this subject from various angles, especially those in accounting, commercial law, and money and banking, and their needs are very different from those who have never studied allied topics.

There is also need for a considerable expansion of our courses in business administration. This is an important branch of business education in which great progress had been made during the last five years. Our work in this field is now confined to a single course for one year conducted during the first semester by Professor Gilman and during the second by Professor Butler. We should have at least five semester courses; one introductory and historical and general in character; one on marketing methods; one on industrial management; one on credits and collections; and one on practical advertising.

Our finance courses should also be supplemented by a course on Investments in which the principles, machinery, and methods by which capital is transferred from those who accumulate it to the industries in which it finally performs its work as a factor of production is discussed, both from the standpoint of economic science and from that of business enterprise.

The passage of the certified public accountant law by our last legislature makes it incumbent upon us to prepare

students for that examination. To this end the addition to our curriculum of more highly specialized courses in accounting is desirable. At least one, and possibly two other courses in accounting should also be added to our curriculum to meet the needs of engineers and of graduates and other advanced students in economics.

The present course in business administration (Political Economy 8d) and such other courses in this field as may be added in the future, together with such additional courses in accounting as may be provided, commerce students should be permitted to take without adding to the total number of credits required for graduation. This can be accomplished, either by allowing these courses to be accredited towards graduation by all students in the College of Letters and Science, or by permitting commerce students to count those subjects towards a major which they shall be allowed to take in those lines.

The provision of the above mentioned courses, which seems to me to be essential to the progress and continued success of the Course in Commerce as at present constituted will require the addition of another full-time man to our force in accounting, and the acquisition of the entire time of Professor Butler, who is now giving us only one-sixth of his time. Professor Butler is admirably fitted by training, experience, and inclination to do the work we require in business administration and also to conduct much needed investigation in that field. If we should secure his entire time, the work he is now doing in the Extension Division would, of course, have to be assigned to some one else. When an additional full-time man is provided in accounting, the services of at least two student assistants can be dispensed with, for a time at least.

The time seems to me to have arrived for a considerable enlargement of the scope of the work now being done at the University in the interests of the commerce and industry of the state and of the nation. So far our work has been confined to the development of a single four-year course in commerce leading to the degree of B. A. and restricted by the limitations imposed upon all who are candidates for that degree. The establishment and development of such a course was undoubtedly the first task to be performed in this field. Most

of the work involved in completing it, however, has been done during the last fourteen years. Along this line there remains only the maintenance of this course and its modifications from time to time as conditions change. New tasks equally imperative have appeared, however, the undertaking of which the University ought seriously to consider.

To one of these I have called attention in my two last biennial reports, namely that of making adequate provision for the needs of the large majority of our students who remain here one or two years only and who are now forced to take the first year or the first two years of our four-year course or a slight modification of the prescribed work of those years. Within this group is a number, constantly increasing in proportion to the total, who wish to specialize in certain subjects, such as accounting and finance, or to prepare for special kinds of work such as secretaryships of commercial organizations.

The expansion of the courses in accounting, business administration and finance above recommended would help us in meeting the needs of those students, but in addition other courses in money and banking and commercial law, adapted to the needs of first and second year students and one or two courses on the work and methods of commercial organizations should be provided. The regulations now in force in the College of Letters and Science regarding the courses open to freshmen and sophomores should also be modified so as to permit these students to elect the courses thus provided for them.

Systematic investigation in the field of commerce also demands our attention. The facts regarding the methods and costs of the distribution of all classes of goods, manufactured articles as well as raw materials and food products, should be revealed and considered both from the standpoint of the people engaged in the various lines of business involved and of the public. A systematic investigation of our credit system in all its aspects is equally imperative. Unaided individuals can accomplish little in this field. The co-operation of trained specialists, business men, and in some cases of the state is necessary. Should not the scope, equipment, staff and means of the Course in Commerce be so enlarged that it may undertake a part of this work?

During the past two years our regular staff has been assisted

by the following special lecturers: A. P. Richardson, Secretary of the American Association of Public Accountants; A. F. Potts, of the Citizen Gas Company of Indianapolis; G. B. Caldwell, Vice President of the Continental and Commercial Trust Company of Chicago; Hollis Godfrey, Engineer and Scientific Management Expert; and J. B. Tanner, Accounting Director of the Board of Public Affairs and President of the State Board of Accountancy.

Respectfully submitted,

WM. A. SCOTT,

Director, Course in Commerce.

REPORT OF THE DIRECTOR OF THE COURSE IN CHEMISTRY

Dean E. A. Birge,
College of Letters and Science.

Dear Sir: I beg to submit herewith my report as Director of the Course in Chemistry for the biennial period 1912–14.

The details of the enrollment in the Course in Chemistry for the last two years are given in the following table:

1912-1913

	Men	Women	Total
Seniors	19	1	
Juniors	18	1	
Sophomores	17	1	
Freshmen	16	1	
Adult Specials	3		
Total	73	4	77

1913-1914

	Men	Women	Total
Seniors	14	1	
Juniors	18	2	
Sophomores	17	1	
Freshmen	16		
Adult specials	4		
Total	69	4	73

It will be noted that the attendance during the two years has been practically constant, and that all of the students except four were men. The male graduates of the course have had no difficulty in securing positions. With but few exceptions, they took up work in the arts and industries, or in private or gov-

ernmental analytical laboratories. It has not been easy to secure positions for the women. There are as yet practically no openings for them in industrial lines, and, as a rule, they can not secure positions in large analytical laboratories, where men are generally employed. The women have consequently secured positions as teachers; but even in these lines they have not always been able to find employment, for with the exception of the larger high schools and a few schools that teach home economics and agriculture, chemistry is not yet taught in our secondary schools. The men have generally chosen to go into industrial work rather than into teaching, because the former offers greater remuneration and opportunity for advancement. As a rule, the positions which they at first secure yield no larger salaries than teaching positions, but the opportunity for final advancement is more alluring.

During the last two years a stronger tendency to major in agricultural chemistry has been manifesting itself, doubtless because of the demand for good chemists in this line. The courses in food chemistry and in chemical technology have also secured a larger proportion of the students. As the Course in Chemistry is arranged, no student can specialize in the lines mentioned, or in any other lines, without first having a sound foundation in all of the fundamental branches of chemistry and related sciences. That the applied courses are being elected as majors was to have been expected. Nor is it regrettable that students naturally take to these courses after they have had the proper basal work. Thus far all of our graduates have been successful in the work which they have undertaken, and so the reputation which these graduates have established has greatly aided those that have just completed the course in securing desirable positions.

The fact that 140 credits are required for graduation makes it practically impossible for any but the best students to complete the course in four years. It is not infrequently necessary to do summer session work in order to secure the requisite number of credits. The enrollment shows that there is a tendency for adult special students to enter the Course in Chemistry. These mature students frequently find the foreign language requirements quite difficult. It would seem that in cases of this kind the language requirement could be altered to the advantage of the student by asking him to offer either French or German, preferably the latter, but not both. In my previous report I

have called attention to the fact that these foreign languages are no longer so essential to the chemist as they once were, because the chemical literature is now being rapidly translated into English, and a very large fund of chemical knowledge is available in that language. If a reduction in the language requirement is made in the near future, it ought perhaps to be limited to the cases of mature students who have not in their early training devoted time to language study and who have passed the age at which languages are readily acquired. The number of such cases is at present quite small, so that there really is no occasion for immediate action.

The completion of the new wing of the Chemistry building has added greatly to the working space and general facilities. Students in the elementary courses now have the necessary room, and those who are studying in the advanced courses also have proper space. There has consequently been an increased interest manifested in chemical work, especially in the advanced lines of physical, inorganic, organic, and food chemistry. At the present time the chemistry work in the Forest Products Laboratory is being re-arranged, and, with the coming of Dr. Acree, special courses in the chemistry of the celluloses and other carbohydrates will be offered.

It ought to be mentioned here that the students in the Course in Chemistry are all under-graduates, and that they by no means represent all the students who are making a special study of the subject of chemistry. So, for instance, a given number of students who are candidates for the B. A. degree elect chemistry as their major or minor subjects. Again, an increasing number of graduate students, who are candidates for the Master's degree or the doctorate, are specializing in chemistry. The presence of these graduate students has greatly aided in maintaining enthusiasm and a proper atmosphere for the pursuit of chemistry. The fact that chemistry is a basal subject for all the other natural sciences and their practical applications, has brought an ever increasing number of students into the Department of Chemistry, especially in the courses of the first and second years. While this has added to the pedagogical work of the department, it has also served to increase the interest in the study of chemistry in the higher courses. It is to be hoped that the work of chemical investigation will be increased, and that the members of our instructional force will be led to feel that there is time

and opportunity for such work, and that it is considered of special value, for in this way only can the elementary teaching really be kept alive and the advanced courses maintained abreast with the times. Thus, too, will the best of our students be induced to pursue the study of chemistry and its applications which are constantly increasing in importance.

Respectfully submitted,

LOUIS KAHLENBERG,

Director, Course in Chemistry.

REPORT OF THE DIRECTOR OF THE COURSE IN PHARMACY

Dean E. A. Birge,
College of Letters and Science.

Dear Sir: The biennium to be covered briefly in this report has been a noteworthy one so far as the Course in Pharmacy is concerned.

In 1881 the druggists of the state were organized into the Wisconsin Pharmaceutical Association. The first endeavors of this organization were directed toward the enactment of a pharmacy law controlling the practice of pharmacy for the benefit of the public. The second important step taken was to secure, through legislative enactment, the establishment of a Department of Pharmacy at the University in order that the pharmacist of the future might be educated up to the standards desired by the founders. Unfortunately, the hopes entertained by the men of 1881 were not realized and for a time disappointment seemed to give way to despondency. The druggist of Wisconsin had to learn that improvement could not be brought about by legislative enactment alone but depended largely on the much slower process of education.

It is in this necessarily slow process that the pharmaceutical graduate of the University has played an important role. His university ideal of education has given him some of that broader outlook which is so essential to cope with the present complex and perplexing situation. Hence it was with his initiative, that the third important piece of constructive pharmaceutical legislation was undertaken in 1912 by the Wisconsin Pharmaceutical Association. Upon the recommendation of the association, the last Legislature established the first Pharmaceutical Experiment Station. This station is to do for pharmaceutical practice in the state what the Department of Pharmacy has done for pharmaceutical theory.

Although the appropriation of $5,000.00 asked for by the State Pharmaceutical Association was cut in two by the finance committee, thanks to its close affiliation with the University, the station has been in a position to do considerable work, some of which was directly helpful to the pharmaceutical practitioner. A report of the activities during the first twelve-month may be published before the close of this calendar year.

The introduction of the bill establishing the station, known as 247 S, attracted considerable attention. The actual establishment of the station has given rise to favorable editorial comments in the pharmaceutical press. As Michigan and Wisconsin set the example of pharmaceutical education by the state, so the hope is now expressed that, in the course of time, every state will have its pharmaceutical experiment station.

As one of the most important features of station activity, the co-operative experiment in the cultivation of medicinal plants between the Bureau of Plant Industry of the Department of Agriculture and the University has received a new impetus. Heretofore all aspects but that of mere cultivation of the medicinal herb garden had to be sadly neglected. With the improvement of Regent Street by the City, the Tenth Ward association had requested the City, the Park and Pleasure Drive Association, the Illinois Central Railway and the University to improve their respective properties at the intersection of Regent Street and Breese Terrace in accordance with the general plan for improvement suggested by Landscape Architect Simonds at the instigation of the Park and Pleasure Drive Association. The Tenth Ward Association has further suggested that these properties be treated as a unit and be named The Hollister Gardens and that the income from the Hollister Fund to the Park and Pleasure Drive Association be utilized in improving and maintaining these gardens.

Some time during the year 1913 there was paid to the Board of Regents the sum of $5,000.00 by the Hollister Estate. The income for this fund became available with the present fiscal year and thus enabled the faculty to recommend the first Hollister Scholar for the year 1914–15. This scholarship ought to be supplemented at an early date by a University fellowship in pharmacy and pharmacognosy. It is in both of these departments that we have the greatest difficulty in securing

adequate assistants and instructors. Now that practically all of the science departments of the College of Letters and Science have been provided with departmental fellows, the time ought to be opportune to provide at least a joint fellowship for pharmacy and pharmacognosy.

The State Historical Society has also received a sum of money, *viz:* $12,000.00, from the Hollister Estate for the establishment of a pharmaceutical library. If the income from this fund is spent in accordance with the wishes of the donors, historical research in pharmacy ought to supplement scientific research in pharmacy at the University in the future. The opportunity is as splendid as it is unusual, and it is to be hoped that the most will be made thereof.

Through the Department of Pharmacy, the University has continued to co-operate with the State Board of Pharmacy. The board holds its four examinations of the year in the departmental laboratories. This form of co-operation cannot result otherwise than in the elevation of pharmacy and hence must accrue to the benefit of the state at large.

Respectfully yours,

EDWARD KREMERS,

Director, Course in Pharmacy.

REPORT OF THE DIRECTOR OF THE COURSE FOR THE TRAINING OF TEACHERS

Dean E. A. Birge,
College of Letters and Science.

Dear Sir:—The fourth biennial report of the Course for the Training of Teachers, covering the period June 30, 1912 to June 30, 1914, is herewith presented in accordance with your request.

The several sections of the report are presented under the following headings.

I. Statistical Exhibits
   1. *Registration*
   2. *University Teachers Certificates*
   3. *Major Preparation for Teachers Certificates*
   4. *Enrollment: Departmental Teachers Courses*
   5. *Registration: Advanced Course for the Training of Teachers*
   6. *Certificates Granted: Advanced Courses for the Training of Teachers*

II. Principal Developments During the Biennium
   1. *Wisconsin High School*
   2. *Requirements for the University Teachers Certificates*
   3. *Training of Teachers in Industrial Subjects*

III. Miscellaneous Comments
   1. *Departmental Teachers Courses*
   2. *Department of Education*
   3. *Teaching Fellowships*
   4. *Co-operation with the Madison Public Schools*
   5. *Advanced Course for the Training of Teachers*

IV. Problems: Anticipations.

V. Specific Recommendations.

It is obvious that the limitations of space imposed upon this biennial report permit merely the briefest treatment of each of the items indicated.

I. STATISTICAL EXHIBITS.

In the following Tables (I—VI) there is recorded the essential information concerning the number of students whose work has been done within the Course for the Training of Teachers.

It is clear from the comparative data presented that with regard to both the number of teachers trained, and the specific character of their preparation, the situation has remained substantially the same as during the preceding biennium.

TABLE I

Registration in the Course for the Training of Teachers, 1908–14

	1908-09	1909-10	1910-11	1911-12	1912-13	1913-14
SENIORS	153	169	248	241	254	251
Men	37	26	37	50	60	59
Women	116	143	211	191	194	192
JUNIORS	*	214	257	223	217	224
Men		29	43	43	30	61
Women		185	214	180	187	163

*Juniors were not required to register in 1908–1909.

TABLE II

University Teachers Certificates Granted, 1908–14

	1908-09	1909-10	1910-11	1911-12	1912-13	1913-14
Men	37	28*	28*	41*	39	45
Per cent	24.2	16.3	12.5	19.0	19.4	21.4
Women	116	144	195*	174†	162	165
Total	153	172	283	215	201	210

*Certificates granted after report was issued.
†Three certificates withheld on account of medical examination.

SPECIAL NOTE:—Owing to certain peculiar features of the organization of the Course for the Training of Teachers, the number of University Teachers Certificates granted does not represent the total number of teachers receiving training within the University. Graduates of state normal schools, already in possession of a legal license to teach, frequently do not fulfill the requirements for the University certificate. There are, I estimate, together with other graduates of the University who qualify, through the State Board of Examiners, for teaching in the public schools of the state, from thirty to forty such cases each year.

The totals shown above for the years 1909–1910, 1910–1911, and 1911–1912 vary slightly from the totals presented in the biennial report for 1910–1912. These variations are due to graduates fulfilling the requirements for the certificate subsequent to graduation.

TABLE III

Major Preparation of Students Receiving University Teachers Certificates, 1910—1914*

		1910-11	1911-12	1912-13	1913-14	Total
Agriculture	M	1	10	9	16	36
	W					
Bacteriology	M					
	W				1	1
Botany	M		1			1
	W	4	8	4	4	20
Chemistry	M	2			2	4
	W		3	2		5
Commerce	M	1				1
	W		1			1
Education	M	1	7	4		12
	W		3	4	1	8
English	M	2		2	2	6
	W	54	59	51	54	218
Geology	M			1	2	3
	W			5	2	7
German	M	2	1	2	2	7
	W	46	25	23	17	111
Greek	M					
	W	1		1		2
History	M	14	10	8	8	40
	W	35	37	24	26	122
Home Economics	M					
	W	12	3	14	22	51
Latin	M				1	1
	W	22	18	18	12	70
Mathematics	M		1	1	2	4
	W	8	10	7	4	29
Manual Arts	M			1	1	2
	W			1	1	2
Music	M					
	W			1	8	9
Philosophy	M			1		1
	W	1				1
Physical Education	M					
	W			1	2	3
Physics	M	2	1	6	1	10
	W				1	1
Physiology	M					
	W			1	1	2
Political Economy	M	2	1	2	7	12
	W	1				1
Political Science	M				2	2
	W	1	1			2
Public Speaking	M					
	W		1			1
Romance Languages	M					
	W	4	6	6	5	21
Zoology	M					
	W	5	3	1	3	12

* See special note, Table II.

TABLE IV

Registration in the Several Departmental Teachers Courses 1910–1914

	1910-1911						1911-1912						1912-1913						1913-1914					
	First Semester			Second Semester			First Semester			Second Semester			First Semester			Second Semester			First Semester			Second Semester		
	Men	Women	Total	Men	Women	Total	Men	Women	Total	Men	Women	Total	Men	Women	Total	Men	Women	Total	Men	Women	Total	Men	Women	Total
Agriculture	.....	.....	.....	14	1	15	.....	.....	.....	33	1	34	8	.....	8	25	.....	25	9	.....	9	32	.....	32
Botany	.....	.....	.....	0	17	17	.....	.....	.....	.....	11	11	.....	.....	.....	1	6	7	.....	.....	.....	.....	16	16
Chemistry	.....	.....	.....	5	3	8	.....	.....	.....	6	6	12	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	3	8
English	6	112	118	6	89	95	8	91	99	6	79	85	8	88	96	8	85	93	1	84	85	2	73	75
Geology	3	18	21	.....	.....	.....	1	15	16	.....	.....	.....	.....	28	28	.....	.....	.....	4	34	38	.....	.....	.....
German	3	57	60	.....	.....	.....	4	49	53	.....	.....	.....	3	42	45	1	10	11	.....	28	28	.....	.....	.....
History	7	27	34	11	23	34	4	29	33	9	21	30	8	26	34	4	17	21	3	24	27	7	14	21
Home Economics	.....	.....	.....	0	11	11	.....	.....	.....	0	11	11	.....	.....	.....	.....	25	25	.....	.....	.....	.....	36	36
Latin	.....	.....	.....	0	30	30	7	25	32	0	9	9	.....	18	18	.....	12	12	.....	14	14	.....	14	14
Manual Arts	6	0	6	7	0	7	14	0	14	10	2	12	5	2	7	7	2	9	10	1	11	10	4	14
Mathematics	0	12	12	2	9	11	3	5	8	4	12	16	.....	.....	.....	3	9	12	1	7	8	.....	.....	.....
Physical Education	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	8	12
Physics	.....	.....	.....	5	0	5	.....	.....	.....	5	1	6	.....	.....	.....	11	12	23	.....	.....	.....	5	5	10
Political Economy	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	2	.....	.....	.....	4	.....	.....
Political Science	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Romance Languages	0	7	7	0	8	8	3	11	14	4	10	14	.....	7	7	.....	7	7	1	8	9	1	8	9
Zoology	.....	.....	.....	.....	.....	.....	3	1	14	.....	.....	.....	1	2	3	.....	.....	.....	.....	.....	.....	.....	7	7

TABLE V

Registration in the Advanced Course for the Training of Teachers

Items.	Summer session, 1908	Regular session, 1908-09	Summer session, 1909	Regular session 1909-10	Summer session 1910	Regular session, 1910-11	Summer session, 1911	Regular session, 1911-12	Summer session, 1912	Regular session, 1912-13	Summer session, 1913	Regular session, 1913-14	Summer session, 1914
Registrations—New													
Men	5	1	17	1	16	1	12	2	11	2	6	2	3
Women	4	1	11	....	5	....	5	....	16	3	1	....	2
Registrations—Continued													
Men	....	....	2	....	12	....	15	1	19	....	11	1	8
Women	....	....	1	1	7	3	3	....	4	....	6	....	4
Totals	9	2	31	2	40	4	35	3	41	5	24	3	18
Major Subjects:													
Agriculture	....	....	....	....	1	....	....	....	1	....	....	....	....
Botany	....	....	....	....	....	....	....	....	1	....	1	....	....
Chemistry	1	....	2	....	....	....	....	....	....	1	....	....	....
Education	3	....	6	1	8	....	....	....	4	1	5	1	3
English	1	2	6	....	1	1	6	1	5	1	....	....	2
German	....	....	3	....	1	....	1	....	1	....	....	....	....
History	3	....	5	....	3	....	....	....	1	....	....	....	....
Home Economics	....	....	....	....	....	....	4	1	1	....	....	....	....
Latin	1	....	3	....	2	....	....	....	5	1	....	....	....
Manual Arts	....	....	....	....	....	....	....	....	....	....	....	....	....
Mathematics	....	....	....	....	2	....	2	....	4	....	....	....	1
Music	....	....	....	....	1	....	3	....	....	....	....	....	....
Physics	....	....	....	....	....	....	1	....	1	1	....	....	....
Political Economy	....	....	3	....	2	....	....	....	2	....	....	1	....
Political Science	....	....	....	....	....	....	....	....	1	....	1	....	....

TABLE VI

Certificates Granted in the Advanced Course for the Training of Teachers

Certificates Granted	Men	Women
June 22, 1910	3	....
April 6, 1911	4	1
October 11, 1911	5	1
April 25, 1912	3	....
November 13, 1912	4	1
October 8, 1913	3	3
	22	6
Major Subjects:		
Chemistry	1	....
Education	14	....
English	....	3
German	....	1
History	3	....
Latin	....	1
Mathematics	1	....
Physics	....	1
Political Economy	3	....

II. PRINCIPAL DEVELOPMENTS DURING THE BIENNIUM

1. *Wisconsin High School*

That portion of the new building for the Wisconsin High School (approximately two-thirds of the structure as designed), under construction since the spring of 1913, has been completed and was occupied in September, 1914. The delay in providing appropriate facilities for the effective conduct of this school, while due to unavoidable circumstances, naturally resulted in a postponement of the development of the school as a laboratory centre for the training of teachers. Relatively little could be accomplished in the cramped and ill-adapted rented quarters which the school occupied since 1911. Nevertheless, under the efficient direction of Professor H. L. Miller, the school has been completely reorganized with a view of enabling it to accomplish the purposes contemplated by its establishment.

Professor Miller has filed with me a comprehensive statement concerning the work of the school during the biennium. This statement is too lengthy for inclusion in this report. In this connection I would refer you to two recent bulletins of the University*, in which the distinctive features of the organization and operation of the school and of its relationships to the University are completely set forth.

The enrollment of pupils in the several classes of the school during the biennium is shown in the following table.†

---

*Announcement of *The Wisconsin High School of The University of Wisconsin*, 1913–14. Bulletin of The University of Wisconsin, Serial Number 574; General Series Number 398.

Special Announcement of the Course for the Training of Teachers and the Department of Education, 1914–15, Bulletin of The University of Wisconsin, Serial Number 671; General Series Number 482.

†At the present time (October 1, 1914) the school has enrolled 230 pupils.

TABLE VII

Enrollment of Pupils in the Wisconsin High School, 1912–1914

	1912-1913			1913-1914		
	Boys	Girls	Total	Boys	Girls	Total
First Class (Senior)	21	9	30	23	5	28
Second Class	12	4	16	13	7	20
Third Class	8	8	16	22	11	33
Fourth Class	16	10	26	15	9	24
Fifth Class	11	6	17	10	8	18
Sixth Class (Lowest)	11	8	19	11	2	13
	79	45	124	94	42	136
Specials or Unclassified			16			16
Total			140			152

2. *Requirements for the University Teachers Certificate*

After a prolonged consideration of the question, the requirements for the University Teachers Certificate, as these have existed for a number of years, were modified by the faculty in January, 1914. These modified requirements become effective with students graduating after January 1, 1916. They include an increased amount of study in the Department of Education, together with practical work in teaching. Candidates for the University Teachers Certificate must also secure *eight* credits in addition to the one hundred and twenty credits required for the Bachelor of Arts degree; and for such certificate must devote at least one summer session in addition to the regular residence requirements.* These new requirements further give to the administrative committee on the training of teachers an extended power of supervision over all of the so-called professional courses which are taken in fulfillment of the requirements for the teachers certificate.

As is usual in such cases this step represents a compromise between those members of the faculty who believe in specialized preparation for teaching, and those who assume the position that the existing liberal arts course contains an effective preparation for the teacher in the high school. Nevertheless, the new requirements embody a distinct recognition of the claim for an

*These modified requirements apply only to students graduating from the College of Letters and Science.

increased amount of professional study by those students upon whom the University places its stamp of approval of fitness for teaching.

While the influence of these new requirements may not be foreseen with certainty, it is evident that there is an immediate need of a proper classification of the legal certificates awarded by the state to those entering the teaching staff of secondary schools. A clear distinction should be made between the recognition accorded those who have intensively equipped themselves for teaching from those who enter teaching with but a minimum of special preparation.

3. *Training of Teachers in Industrial Subjects*

The establishment of the Department of Manual Arts in 1910, was the first definite step taken by the University to meet the increasing demand of the secondary schools for competent teachers of manual arts and of industrial subjects. The growth and development of this department under the leadership of Professor F. D. Crawshaw has amply justified this venture in the training of teachers.

The Industrial Teaching Scholarship established in 1912–1913 for the purpose of attracting some of the younger, skilled craftsmen from industry into the ranks of teaching, proved so successful that the Regents provided for two of these scholarships for 1913–1914. The University budget for 1913–1914 also provided for six special industrial scholarships. It was the original plan with regard to these special scholarships to appoint six selected individuals who would spend a summer session in special study for preparation for service in the rapidly expanding industrial continuation school system of the state. Owing to the late approval of the budget for 1913–1914 it was not possible to carry out this plan during the Summer Session of 1913. Therefore, a plan for the organization of a so-called Mechanics Institute was devised; and there was conducted from March 9, 1914 to April 9, 1914, under the direction of Professor Crawshaw, a short course for mechanics, in which it was aimed to provide an intensive period of preparation for industrial teaching. Fifteen skilled mechanics were selected and appointed. To each appointee was paid an hon-

orarium of Forty Dollars ($40), which sum was sufficient to meet his local expenses. The instruction was carried on by the University instructors in addition to their regular duties.

As indicative of the success of this mechanics institute it may here be noted that ten of the fifteen mechanics who were members of the institute have since been appointed to teaching positions, either in the regular public schools, or in the industrial continuation schools of the state.

III. MISCELLANEOUS COMMENTS

1. *Departmental Teachers Courses* *

Each of the instructors in charge of a departmental teachers course has submitted to me a report upon the work of his course. To an increasing extent each of these courses is becoming what may be called a *key* course for preparation for teaching the subject in question. With the facilities of the Wisconsin High School for practical work now available, those in charge of these departmental teachers courses will hereafter be put to a real test of demonstrating the practical professional worth of their courses for the intending teacher.

2. *Department of Education*

With the adoption of the new requirements for the University Teachers Certificate, and with the laboratory facilities contained in the Wisconsin High School, the Department of Education will now possess a much larger opportunity to influence the general professional preparation of students qualifying for teaching; and also to select more rigidly those who, on the basis of intellectual capacity and personal promise, are entitled to University approval of fitness for teaching.

The appointment of Mrs. Edith Hoyt as instructor in Education in the Extension Division will, it is hoped, enable a closer and more effective conduct of the courses of instruction in Education now given through correspondence. This appointment is a part of a larger plan, which is being developed by the department, in an endeavor to make more available to the

*See Table IV for data concerning enrollment in these courses.

teachers and supervisors in the public schools of the state the professional resources of the University.

3. *Teaching Fellowships*

The plan of teaching fellowships, instituted four years ago, has been continued. For 1914–1915 the number of those fellowships has been increased from six to eight. During the last year the placing of the holders of these fellowships in the co-operating high schools was accomplished only after considerable difficulty. This condition of affairs came about in spite of all reasonable efforts on the part of the authorities of the co-operating schools. The difficulty is more or less inherent in the plan. In the absence of any regular and effective oversight, from the University, of the probationary teaching of these fellows, and in view of the new circumstances surrounding the training of teachers created by the Wisconsin High School, it is my intention to consider carefully during the coming year whether or not it is desirable for the University to continue these teaching fellowships.

4. *Co-operation with the Madison Public Schools*

Preliminary steps have been taken to reorganize the scheme of co-operation with the Madison Public Schools that has been in operation during the past seven years. Such a reorganization has been in contemplation since the establishment of the Wisconsin High School. This school, providing, as it will, the core of the professional training for teaching, will still need to be supplemented by the largest obtainable opportunities in the Madison Public Schools in order to give to all of our students a minimum of chance to be brought into contact with the practical issues of teaching.

5. *Advanced Course for the Training of Teachers*

My best judgment concerning this course was contained in my last biennial report. That judgment I repeat here. "The conclusion of my careful observation of the operation of the advanced course during the past four years is that it scarcely warrants its continuance as an academic device for the encouragement of graduate professional study. A graduate standard for public school teaching and supervision does not appear possible without some legal sanction."

Furthermore, the new requirement for the University Teachers Certificate, of a summer session of study in addition to the regular residence requirement for the Bachelor's degree, places the advanced course in an anamalous position.

IV. PROBLEMS—ANTICIPATIONS

During the last few years three specific objects have been before me as Director of the Course for the Training of Teachers. May I speak of each of these briefly:

1. *The establishment of a physical centre about which the distinctive activities relating to the preparation of teachers could be organized and given a definite professional unity.*

To anyone, familiar with the situation as it exists in the greater number of our larger universities, the striking fact is the general absence of any craft feeling on the part of those students being prepared for the work of teaching. Moreover, there frequently seems to be a sort of institutional pride in avoiding the development, on the part of those looking forward to the service of teaching in the lower schools, of anything akin to that professional allegiance which is thought so desirable as an element of preparation for other professions. There are, of course, a number of contributing causes for this situation. As I have been able to analyze the situation in this university, I am convinced that a partial remedy is to be found in the establishment of a distinct physical centre which will represent concretely to students and to faculty the professional endeavor of the University in the interest of teaching. At the present moment teaching is the only one of the professions fostered by this University that cannot claim a home, however humble. The Wisconsin High School building in its completed form was planned to be such a professional centre. At present this building is sufficient for carrying on the work of the high school instruction only. The construction of the remaining wing of the building would enable a proper centralization of all of the professional instruction now given through the Department of Education and the special teachers courses of the several departments of the University. Until such centralization is brought about the school itself will not be able to

render its full service to the University; nor will there be developed in our student body that craft consciousness, the absence of which is a real obstacle to the professional training of teachers within the University.

2. *The constitution of a proper budget for the work for the training of teachers.*

The present budget of the Course for the Training of Teachers is a fiscal anomoly. It includes but a small portion of the amount devoted to the work of the training of teachers. It also includes items that have a remote relationship to that work. A properly constituted budget for the Course for the Training of Teachers is desirable in order that the University and the State may know how much money is actually being spent on the work of the training of teachers.

3. *The development of a closer constructive supervision of those University activities existing primarily for the professional training of teachers.*

A most important advance step was made last year when the requirements for the University Teachers Certificate were modified in that the Committee on the Training of Teachers was given the supervisory direction of the professional work which will, it is hoped, serve to bring about greater unity than has been possible under the former plan of departmental autonomy.

V. SPECIFIC RECOMMENDATIONS

As a matter of definite record, and for your further consideration, I present the following recommendations, the supporting arguments for which will be elaborated in connection with the next budget proposals for the Course for the Training of Teachers:

1. *That the Wisconsin High School building be completed at the earliest possible date.*

2. *That provision be made for the regular visitation and assistance, by the University, of all teachers in the high schools of the state, who are graduates of the University Course for the Training of Teachers, and who are in their first year of teaching service.*

3. *That adequate financial provision be made for the conduct of the Wisconsin High School during the summer quarter.*

4. *That the salaries of the teaching staff of the Wisconsin High School be arranged in accordance with such a definite schedule as will enable the securing and retaining of teachers of superior skill.*

5. *That provision be made for courses of instruction in the Department of Education, and in such other departments as may be necessary, for the advanced instruction of teachers of defective children, and of other special classes of pupils now being established in the public school system.*

Respectfully submitted,

EDWARD C. ELLIOTT,

Director, Course for the Training of Teachers.

REPORT OF THE CHAIRMAN OF THE COURSE IN JOURNALISM

Dean E. A. Birge,
College of Letters and Science.

Dear Sir: In response to your request, I beg leave to submit the following report on the growth and the needs of the Course on Journalism.

GROWTH OF THE COURSE

When the first course in journalism was organized by the present chairman in the fall of 1905 it was one of the first attempts in this country to give college students systematic training in preparation for newspaper writing and editing. In 1906–07 those studies in the College of Letters and Science that were most important in preparation for journalism were organized into a four-year "Course Preparatory for Journalism." These courses were reorganized in 1909 into the present "Course in Journalism." In 1912 the courses in journalism were organized as a separate department, affiliated with the English Department, but with a chairman and budget of its own. This year the Department of Journalism has been made independent of the Department of English, so that students may now take their undergraduate major in journalism.

Since the first classes in journalism were organized at The University of Wisconsin and a four-year training course in preparation for journalism was provided, other institutions have developed similar courses until now practically all of the larger state universities and many colleges offer instruction in this field. In the large state universities technical training in journalism has been developed to a greater degree than it has at Wisconsin, for well equipped printing plants have been es-

tablished at a number of these institutions, from which daily newspapers are issued by the students of journalism.

Despite the rise and the development of the teaching of journalism in these other colleges and universities, the number of students enrolled in the Course in Journalism at The University of Wisconsin has steadily increased. It now ranks as the third largest of the special training courses in the University, being exceeded in numbers only by the Course for the Training of Teachers and by the Course in Commerce. It is also among the largest schools of journalism in the colleges and the universities of the country.

The Course in Journalism has been materially strengthened during the last two years. The organization of the Department of Journalism as an independent department this year has been of decided advantage in the development of its instructional and administrative work. The lack of adequate quarters for the Department of Journalism which has seriously handicapped its work for several years has been remedied by assigning to the department this year that portion of the third floor of South Hall hitherto occupied by the Department of Bacteriology. When these new rooms are fully equipped, they will afford ample space for the varied needs of the department. The addition to the instructional staff of the department of an assistant and a student assistant also makes possible more effective instruction. The efficiency of teaching in the department has been greatly increased during the past few years as a result of the extension of a plan of having frequent conferences with every student in the journalism classes. At these individual conferences the instructor goes over with each student his work of the week in order to show him how to overcome his difficulties in writing.

Through co-operation with other departments of the University it has been possible to add several important studies to the Course in Journalism.

By arrangement with the Extension Division the services have been secured of Professor R. S. Butler of the Department of Business Administration as lecturer in journalism for a course in Newspaper Advertising. This course, which was given for the first time last year, is to be offered every year hereafter. By means of this course and that which has been given by the

Department of Philosophy for some years on the psychology of advertising, students of journalism are now able to study the fundamental principles of one of the most important phases of newspaper and magazine making.

The Department of English last year opened its course in commercial correspondence and the writing of advertising booklets to students in the Course in Journalism in order that they might have the advantages of this training which had hitherto been restricted to students in the Course in Commerce.

To familiarize students of journalism with newspapers of other countries and to aid them in keeping informed on present political, social, and economic conditions abroad, a course in the reading and the study of French newspapers was provided in co-operation with the Department of Romance Languages, and a similar course in German newspaper is being given for students of journalism by the German Department.

In the absence of a printing plant and of a daily newspaper under the control of the Department of Journalism, efforts have been made to give students as much practical training as possible in connection with the two Madison daily papers and the Daily Cardinal. Through co-operation with the editors of the Madison papers the department has been able to have students do reporting for these papers. The opportunities for this kind of work are necessarily limited and are not a satisfactory substitute for the practical training that could be given to all students of journalism under the direct supervision of instructors in the department, if a daily paper were published under the direction of the department.

NEEDS OF THE COURSE

1. The greatest need of the Course in Journalism, as is evident from the foregoing statements, is some means of giving students in the course adequate practical training and experience in the important details of newspaper writing and editing. Practically all of the other large state universities that have established courses in journalism have provided printing plants for their departments of journalism at which daily newspapers are published under the direction of the instructors. Since

attention was called to this fact in the last biennial report, three more universities have established printing plants for their students of journalism, so that in six universities practical training is now being given through the medium of a paper published by the department at its own plant. The cost of installing these plants has ranged from $5,000 to $15,000 according to the equipment. In one university a regular daily newspaper is published as a competitor of the local papers of the city in which the university is situated; in the other universities the college daily paper is made the medium for giving the students practical experience, under direct control of the department.

The time seems to have come when a decision should be made in regard to the future development of instruction in journalism at the University so far as practical training and experience are concerned. If Wisconsin is to follow the lead of other state universities in this matter, provision should be made for a printing plant at which a daily paper can be published. It may well be argued that a university like Wisconsin that has provided machine shops for the training of engineers; laboratories for the training of chemists, pharmacists, and physicians; a creamery and cheese factory, greenhouses, and experimental farms for the training of agriculturalists; a practice school for the training of teachers; and a practice cottage for the training of young women in home economics, should make equally satisfactory provision for the training of newspaper writers and editors. The number of students enrolled and the importance to the state of the profession for which students of journalism are being trained would seem to warrant the expenditure of an amount proportionate to that appropriated for the equipment of these other departments.

Instruction in journalism, as was pointed out in the last biennial report, is given at Wisconsin with a smaller investment for equipment, with a smaller annual appropriation for salaries, and with a smaller staff of instructors than it is at most of the other large state universities, despite the fact that more students are enrolled in the Course in Journalism at Wisconsin than at any other of these universities.

Thus it is evident that for students of journalism the University of Wisconsin provides less liberally than it does for

students in other practical training courses and less liberally than do other large state universities for their students of journalism.

2. Whether or not it is decided to equip the Department of Journalism with a printing plant, provision should be made at once for adequate supervision of the work of students on the undergraduate publications. Members of the faculty should be assigned to direct the efforts of the students on the editorial and business staffs of these publications just as coaches are provided from the faculty for students' athletic, musical, dramatic, oratorical, and debating activities. If students are permitted to devote as much time and effort as they are now doing to their work on the publications, they should have careful direction in this work so that they may derive the greatest benefit from it. Student journalism undoubtedly has as great educational value as any other form of student activity. That the value of this training and experience could be increased many fold if students did this work under members of the faculty appointed for this task because of their journalistic and business ability and experience, no one can question. This plan would require that one of the members of the instructional staff of the department of journalism and one of that of the department of business administration be assigned to give part of their time to showing student editors and business managers how to do their work on the publications most efficiently. Under present conditions it is impossible for members of the faculty in the departments of journalism and business administration to undertake this direction of students' work on the publications, in addition to their instructional and administrative duties.

3. Other needs of the Course in Journalism include a projecting lantern by which students' written work can be thrown on a screen for correction before a class; a collection of lantern slides to illustrate the history, development, and present conditions in American and foreign journalism; moving picture films to teach students accuracy in observing and reporting; and a reference library for the reading room of the Department of Journalism.

Respectfully submitted,

WILLARD G. BLEYER,

Chairman, Course in Journalism.

REPORT OF THE DIRECTOR OF THE SCHOOL OF MUSIC

Dean E. A. Birge,
College of Letters and Science.

Dear Sir: I submit herewith the biennial report for the School of Music students.

The number of students in the School of Music during the period covered by this report has increased. This is shown by the following comparative statement:

	1912–13	1913–14
Students in regular session	76	95
Students in summer session	142	211
	218	306
In addition to this there were students from other colleges electing music	342	328

CHANGES IN THE FACULTY

During the biennium there have been several important changes in the faculty. The Director of the School of Music resigned as director in March, 1914; but he is to continue as a professor during the first semester of 1914–15. I was appointed Director, appointment to take effect at the beginnning of the fiscal year 1914–15, and in accordance with this appointment I assumed my duties on September 3, 1914. Professor Peter W. Dykema was appointed professor of music in July, 1913. Assistant Professor Locke, of the piano department, resigned at the end of the year 1913–14.

DEPARTMENTS

The work of the departments of applied music and the theoretical branches has been carried on as in former years, with perhaps a normal development. My six weeks of office has not enabled me to judge of their standards of work, yet I am convinced that these departments suffer in as much as

they do not lead to a specific degree of Bachelor of Music or Bachelor of Arts in Music instead of the vague degree "Graduate in Music". Steps should be taken to remedy this as soon as possible.

There has been given one course which has had a large enrollment, *i. e.*, the Appreciation of Music. This has evidently been treated more from the popular basis than from the scientific. While such a course is extremely necessary and advisable, I feel that it should be given in two distinct sections, if our resources permit it,—one as an advanced course for students in music, the other as a popular course similar to course 114 in Greek, and 130 in German.

There has been a decided increase in every way in the Department of Public School Music. There is a well arranged two years' course which meets the demands of the public school situation as adequately as any training school now in existence.

With the co-operation of some of the schools in Madison, during the past year, the students have had splendid facilities for practice work. Beginning in 1913, all Public School Music graduates are required to have one full year of practice teaching. This, with their training in the University is making them in great demand and they are securing very good positions, with the result of causing the reputation of the department, which is becoming recognized as one of the best and most thorough in the country, to be widely known.

The continually widening field, however, of the Public School Music supervisor, both in the school and community, makes it desirable that opportunities be given by the University for more extended preparation which shall ultimately develop into a four years' course leading to a degree.

CONCERTS

There have been two innovations in this section of the work of the school during the biennium, the first being the introduction of exchange concerts, in the Artists' Series, with another university, which will be of great benefit to the school, the second being the concerts of the Choral Union. Regarding the latter, I speak of the opinions that have been received from several reliable sources. The Yuletide Festival was arranged

in such a way as to convey the spirit and meaning of Christmastide.

The Spring Festival was of larger dimensions and consisted of three concerts, the first by our own orchestra and chorus, the second, an orchestral concert by the Minneapolis Symphony Orchestra, and the last by our own chorus and the Minneapolis Symphony Orchestra, the main work being Verdi's Requiem. All accounts of these concerts have been most enthusiastic.

There were also the usual Artists' Series, faculty concerts, student recitals, concerts by the band and orchestra. While these were of high grade, all must have suffered to some extent in their general effect by not having adequate facilities and proper quarters for giving them, as neither the Gymnasium nor the Music School auditorium are proper settings for such artistic attempts. I may add that I have seldom seen in all my professional career such unsuitable places.

NEEDS OF THE SCHOOL

As a newcomer it is impossible to state adequately the needs of the school. I am therefore giving what is of the most urgent importance.

1. An entire remodelling of Music Hall.

This would cost from $40,000 to $60,000. As is well known, the accommodation in Music Hall is very poor, more than half of the rooms are in the basement, and at that there are not enough of them. The auditorium is not properly arranged for seating and the acoustics are very bad. The sums mentioned are based upon sketches prepared by the supervising architect.

2. Improved equipment for the school.

For this item, a sum of from $10,000 to $15,000 is necessary. Most of the pianos are worn out, and need replacing. The organ is unplayable, and it is not worth while spending money upon it.

3. Increase in faculty, $3,000.

As the school curriculum needs some alteration and enlargement, provision should be made for additions to the faculty. A fund of $3,000 should be allowed for this.

Respectfully submitted,

CHAS. H. MILLS,
Director.

REPORT OF THE DEAN OF THE COLLEGE OF AGRICULTURE

President Charles R. Van Hise,
The University of Wisconsin.

Sir:

I am submitting herewith the biennial report for the period ending June 30, 1914. During this interim the work of the College of Agriculture has continued to grow and expand with great rapidity. Not only has there been a marked growth in number of students, but in the relations of the college to the state at large, the work has been greatly broadened and more completely organized.

In the following report only the more important phases of the activities of the college can be touched upon. It is especially necessary in these days of such rapid expansion that plans for the future development of the college should be forecasted as far ahead as possible, and most carefully matured, so that adequate foundations for the work may be properly laid.

This report is presented under the following heads:

I. General activities of the college.
   (a) Resident instruction.
   (b) Research work of the Experiment Station.
   (c) Agricultural Extension Service.

II. Additions to resources.

III. Needs of the college.
   (a) Constructional requirements.
   (b) Organization of lines of work.

1. GENERAL ACTIVITIES OF THE COLLEGE

A. Resident Instruction

Attendance

The instructional work with resident students has grown apace within the last few years. At the close of the last biennium (1910–11 and 1911–12) in the regular full year courses there were 609 students in agriculture and 134 in home economics, a total of 743. At the end of this biennium there are 817 in agricultural work and 205 in the women's course, a total of 1022, or an increase of over 37 per cent. In this connection it is important to note that the graduate work has shown a very marked increase. With the development of strong departments, adequately equipped to carry on advanced work, the demand for this type of instruction is rapidly increasing. Students contemplating agriculture from the standpoint of teaching or research are finding that the general four-year course is inadequate to meet the needs of a thorough training which will embrace the fundamentals of both the pure and applied sides of their specialty.

In the Summer Session the expansion has been even more rapid, an increase from 127 to 301. It seems more than likely that the immediate future will see a continuance of this growth, although naturally less rapid when computed on a percentage basis, as the very great demand which now obtains in extension and high school instruction bids fair to exceed for some time the number of suitably trained men that are available for this work.

Attendance on the sub-matriculate courses has also been well maintained, although the larger number of county agricultural schools has increased the opportunities for instruction quite similar to that given in the Short Course. During the first year of this biennium the Forest Rangers' Course was started. This year 28 students were in attendance on this work.

At the close of 1913–14 our college staff comprised the equivalent of 93 members (part-time assistants computed on basis of service rendered). The assignments were as follows:

Resident instruction	40 persons
Research or Experiment Station work	28 persons
Extension Service	18 persons
Control or Inspection Service	7 persons

Modifications in Agricultural Curricula

In a subject that is undergoing as rapid a change as agriculture, it is not to be expected that a hard and fast course of instruction can be offered. The theory on which this course is founded prescribes a large fraction of required work, both in the fundamental liberal arts branches, as well as in the applied field. Adjustments are necessary from time to time to balance more properly the required and the elective work, for further experience is constantly showing where improvements can be suggested.

During this biennium changes were made in the two-year Middle as well as in the four-year Long Course. The required units for the Middle Course were increased from 64 to 68, and changes made which rendered possible a somewhat wider option as to electives. Owing to the fact that this course seems to be drawing a considerable fraction of students from the cities where they have had but little practical farm experience prior to entering the University, the faculty adopted a rule requiring the student to present evidence of at least a full year's practical farm experience before taking the second year of this course.

In the four-year work, a required course in Organic Chemistry has been added, making the chemical work even more important than heretofore. The work in Physics has been rearranged to be given throughout the entire year. The requirements in Bacteriology have been materially altered, while the language requirement for a year of German has been modified, so that a student offering extra language units for entrance is absolved from continuing foreign language work in the course, and option between German and French is now offered.

The unusual demand for teachers in the secondary schools has led to special efforts being made to direct the work of students desiring preparation for this field. While it does not seem advisable to organize a special course to meet this need, a distinct attempt is made to direct the work of students so that their preparation may be more adequate than is likely to obtain where unlimited freedom of electives is permitted.

Opportunities in Agriculture

The field for trained men in agriculture has expanded very rapidly within the past few years and seems likely to continue

for some time to come. The rapid introduction of agricultural instruction into the high school curriculum (five state high schools offered agricultural courses in 1910; 100 in 1913), and the correlation of this work with extension activities in the communities thus served has increased tremendously the demand for properly qualified instructors. The passage this spring of the Smith-Lever Agricultural Extension bill by Congress is giving a still greater impetus to field demonstration work in the colleges.

The salaries that can be secured in the agricultural field are unusually high when compared with the earning powers of the average college graduate. Last year the average salary of our graduates accepting salaried instructional positions was $1100; those engaged in practical work $930.

Even with this stimulus, an increasing number of our graduates are going into the practical field. Forty-four per cent of the graduates of the two classes of the current biennium reporting their occupations are now engaged in practical work.

The unusual opportunities that now obtain in agriculture are inducing many students to seek this course without having had any previous practical farm experience. Year by year, the percentage of city bred students is increasing. Now it constitutes nearly one half of our entire enrollment. This year 45 per cent of the freshman class had less than one year of farm experience. About 20 per cent of these had no farm experience whatever. This lack of farm experience of students works disadvantageously to the student, and the faculty are attempting to overcome this defect.

Summer Session Work

While the demand for summer work in agriculture comes primarily from teachers who are at work in the secondary schools, and who desire an opportunity to perfect more completely their training in this direction, yet the opportunities offered in the Summer Session have also been eagerly embraced by a not inconsiderable number of other students. For the past two years the ratio of teachers to the student group was substantially 1 : 1.

For agricultural study in certain lines the summer presents an opportunity that is not offered in equal degree during the regular sessions of the University. Studies on crop production, soils and their management, diseases of plants, horticultural problems,

and farm management work, can be made much better during the growing season than at any other time. For several years a field course in farm management has been given in which an unusual opportunity has been offered to learn at first hand managerial methods as developed on some of the most successful farms of the state. This course has been a feeder to our accredited farm work, especially as it relates to graduate credit. The success of this extra-mural work has led to similar attempts in other courses for this season. Obviously there are many inherent difficulties in presenting work of this character, but where the time of the student can be wholly employed, it is possible to secure results in this way which cannot be duplicated by resident instruction at the University alone.

For a number of years opportunty has been given students in dairying to continue practical work in the University creamery after the close of the regular six-week summer session. Here again is an opportunity in agriculture that should no longer be neglected. Many field operations can be done only during the growing season, and this summer several courses have been planned to extend beyond the limits of the summer session to a period of ten weeks. Consideration has been given the advisability of continuous sessions in agriculture on a four-quarter basis, but the difficulties in securing a properly qualified staff and the financial problems make it inadvisable to inaugurate this step at present in a general way. The experiment of lengthened sessions will be tried out first with reference to certain additional departments like Soils and Agronomy.

Home Economics Courses

During this last biennium the course in home economics has been differentiated to the extent that it is now possible for the student to specialize in either food or textiles, thus giving a more intensive study to a more limited field. Pedagogically, home economics is now undergoing the same development as agriculture did some fifteen or twenty years ago. Sooner or later the general subject, which relates to all phases of activity as applied to the problems of the home, will be differentiated into more special fields of knowledge, and will necessitate the application of the principles of the fundamental sciences to be applied problems that are pressing for consideration on every hand. More

and more demand is developing for advanced work in the several fields of this subject.

As presented in the report of the Director of the Course in Home Economics, an increasing number of elections are being made by Letters and Science students. The recently organized course in Humanics, reviewing the laws of child development, which was opened last year to seniors as auditors, was elected by about 50 students. About 200 students from Letters and Science are now taking elections for credit.

Sub-Matriculate Short Courses

The winter Dairy Course and the Short Course in Agriculture have been continued without any essential change. The inauguration of special exercises at the close of the Short Course has dignified the completion of the work of these students. Special efforts have been made to develop extra-curricular activities with these students. Attempts have been made to create interest in musical and literary society work, and social opportunities have been provided. The results of these attempts have been extremely beneficial. Indeed it may be confidently stated that no class of students in attendance at the University derive more substantial profit from their work than do these farm boys, and no class of students are more loyal to the institution in after years.

The organization of county short courses in agriculture to be given by the county agricultural representatives in the different counties promises to be an interesting educational experiment. Work for two winters of eight to ten weeks each, supplemented with practical work on the farm during the intervening summer, under the immediate supervision of the resident representative, gives an opportunity for the farm boy who has finished the country school and has not gone forward into the high school. Essentially these county short courses are continuation schools in agriculture, but are beng conducted without state subsidy, and at a merely nominal expense, as the services of the county representative are thus utilized for instruction during the winter months. The five courses given this past winter in as many counties were attended by over seventy students. It is worth noting that some of the scholars in these schools are already coming to the University Short Course, showing the value of this effort in awakening an educational impulse in the minds of these boys who had dropped out of educational work.

The first year of this biennium a course of instruction was organized for Forest Rangers in connection with the State Board of Forestry. The educational need in this subject is not for an additional number of technical forestry schools, but for brief courses of instruction to train rangers for the practical work of forest management. The course arranged consists of two winters' work at the University with the entire intervening summer spent in instruction and practical work in the woods. Cooperation with the State Board of Forestry in the matter of the field work makes it possible to give admirable training of a practical nature. It will be to the obvious advantage of the state thus to be able to pick well trained men for the development work in reforestation and management of the state forests.

Organization of Work

The only new department that has been organized in the college this biennium is that of Forestry. This work was started two years ago under Professor Moody and was primarily designed to develop the Forest Rangers' Course, but provision was made for the presentation of woodlot management or farm forestry to both the Long and Short course students. The vacancy made by the resignation of Professor Moody at the end of the first year was filled by the selection of Professor A. M. Cook, formerly Supervisor of the Arapaho National Forest, Colorado. Courses in apiculture have been added to the work of the Economic Entomology department.

The section of Dairy Tests which has heretofore been administered in the Department of Agricultural Chemistry, has been transferred to the Animal Husbandry Department, the work being placed in charge of R. T. Harris, who, for a number of years, has assisted Professor Woll in this work. This arrangement was made when Professor Woll severed his long connection with the college. In point of service Professor Woll was the oldest member of our active staff. The Feed and Fertilizer Control work remains in the Department of Agricultural Chemistry and has been placed in charge of W. H. Strowd.

The work of the Department of Agricultural Bacteriology was increased at the end of this biennium. Heretofore the agricultural students have taken a general course in the College of Letters and Science as a pre-requisite to a course in applied work; also the Home Economics students have pursued their bacteriological training in the same department under Professor Frost.

At the close of this year, Professor Frost was transferred to the College of Agriculture. Hereafter both the Home Economics and Agricultural students will secure their training in this branch in this college.

The chairmanship of the Department of Agricultural Engineering was rendered vacant through the resignation of Professor Ocock in July, 1913. F. M. White has been made acting chairman this year.

The passage of the Potts bill by the legislature of 1913 made possible the more complete organization of the county agricultural representative system. Authorization for the inauguration of the work of these resident instructors in ten counties was made. At the close of this biennium this work has already been organized in the total number of counties possible, all of which are located in the northern part of the state where agricultural development is the most active. E. L. Luther, formerly representative in Oneida county, has been made a field supervisor of this system.

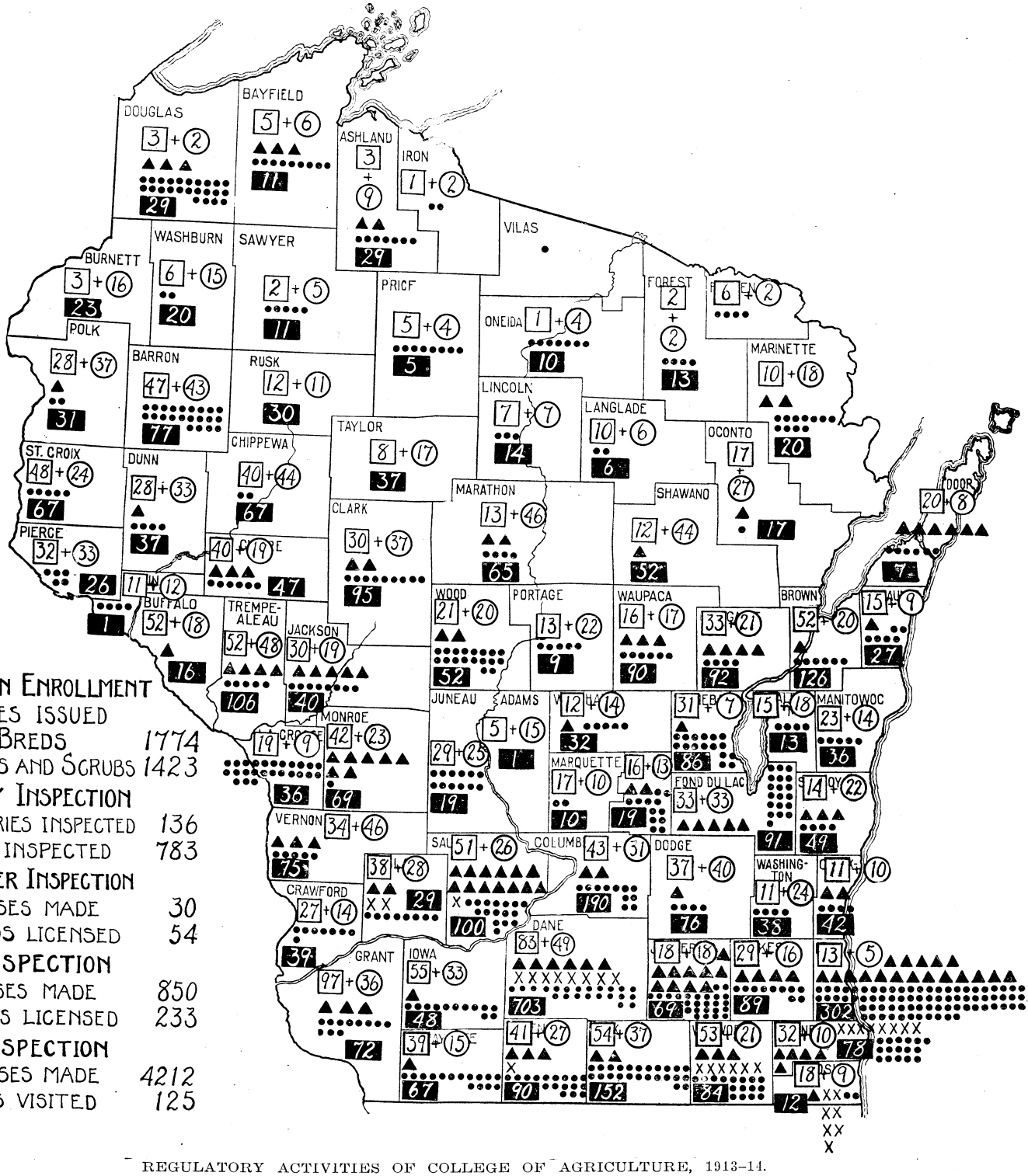
The administration of the Farmers' Institutes has been changed this year. For twenty years George McKerrow has conducted this important work throughout the state. Professor Norgord of the Agronomy Department has been appointed as his successor, but will, however, retain the superintendency of our Hill farms.

But very few changes have occurred in the ranks of our professorial staff. Mr. A. W. Hopkins, formerly editor of the Wisconsin Farmer, was appointed Agricultural Editor and Professor of Agricultural Journalism, in place of J. Y. Beaty, resigned. Professor Peterson, of the Soils Department, resigned in September, 1912, to accept a position in Idaho. Other than those above mentioned should be recorded the resignation of Professor Hoffmann, whose special field was soil bacteriology. His position has been filled by the appointment of Professor E. B. Fred.

B. Research Work of the Experiment Station

The agricultural experiment stations were founded by the federal government to discover the fundamental principles of agricultural science and to perfect methods of improving agricultural practice, but any conclusions drawn must be tested out under normal field conditions in the crucible of practical trials before the same can be safely utilized in general practice.

The great variation in the character and quality of the farm-



STALLION ENROLLMENT

LICENSES ISSUED

□ PURE BREDS	1774
○ GRADES AND SCRUBS	1423

NURSERY INSPECTION

▲ NURSERIES INSPECTED	136
ACRES INSPECTED	783

FERTILIZER INSPECTION

x ANALYSES MADE	30
BRANDS LICENSED	54

FEED INSPECTION

• ANALYSES MADE	850
BRANDS LICENSED	233

SEED INSPECTION

■ ANALYSES MADE	4212
TOWNS VISITED	125

REGULATORY ACTIVITIES OF COLLEGE OF AGRICULTURE, 1913-14.

The various lines of inspection service are of much importance in protecting the farmers of the state against fraud.

ing operations in this state makes the work of the Experiment Station cover a wide variety of conditions. Our problems range from those found in old agricultural sections, such as questions relative to the restoration and maintenance of fertility and the prevention of fungous and insect diseases, to the inquiries of the pioneer on the subjugation and management of raw land and the adaptation of crops to relatively new and untried localities. The great majority of lines of endeavor are those that have been under way for a series of years, for naturally the problems that an experiment station should attempt to answer are those that are fundamental, of long duration, and therefore beyond the ability of the individual to try for himself, even if he were in position to attempt the same.

In the last biennial report attention was called to the exceedingly rapid growth of the teaching work, and the danger that exists to the research work of the Experiment Station by the unexpected demand made on members of the staff to meet the teaching needs. While this pressure still continues, great care must also be taken to see that the rapidly expanding work of extension does not interfere with the proper development of research. It is not to be expected, nor is it wholly desirable, that all three phases of agricultural development—teaching, research, and extension—shall be developed in each department in an equal degree, but the college of agriculture that is serving its constituency to the fullest extent must be one that is training its youth efficiently, pushing forward the boundaries of knowledge, especially wth reference to the particular problems of the state, and finally so organizing and correlating its work that the results of the laboratory are applied by the field worker. These results must be presented in such form that they are not only susceptible of direct application but that they may be driven home with such force as to command adoption into current practice.

It will be impossible to give here a digest of even the more important research activities of the Experiment Station. These are quite fully detailed in the reports of the Director of the Experiment Station, which have been published as Bulletins 228 and 240, for the years 1912 and 1913 respectively.

Publications

In the last two years 36 bulletins and circulars of information have been issued, aggregating 1609 pages. The following list will indicate the scope of work thereby presented.

No	Title	Author	Date of issue.
	BULLETINS		
223	The Climate of Wisconsin and Its Relation to Agriculture	Whitson and Baker.	July, 1912
224	Selecting Steers for Feeding	Tormey	June, 1912
225	Commercial Varieties of Potatoes for Wisconsin	Milward	July, 1912
226	The Wisconsin Dairy Cow Competition	Woll and Harris	July, 1912
227	The Wisconsin Nursery and Orchard Inspection Service. 1910-1912	Sanders	December, 1912
228	Report of the Director. 1911-1912	Russell	January, 1913
229	The Right Drain for the Right Place	E. R. Jones	April, 1913
230	Soil Acidity and Liming	Whitson and Weir	May, 1913
231	The Marketing of Wisconsin Cheese	Taylor, Schoenfeld and Wehrwein	April, 1913
232	Fitting Yearling Wethers and Lambs for Exhibition	Humphrey and Kleinheinz	August, 1913
233	Wheat Growing in Wisconsin	Delwich, and Leith.	September, 1913
234	Rural Social Centers in Wisconsin	Galpin	January, 1914
235	Soiling Crops vs. Silage for Dairy Cows in Summer	Woll, Humphrey and Oosterhuis	March, 8914
236	Soy Beans—An Important Wisconsin Crop.	R. A. Moore and Delwiche	April, 1914
237	The Control of Diseases and Insects of Tobacco	J. Johnson	May, 1914
238	Agricultural Co-operation	Hibbard	June, 1914
239	Three Creamery Methods for Making Buttermilk Cheese	Sammis	June, 1914
240	Report of the Director 1913	Russell	June, 1914
	RESEARCH BULLETINS		
25	Studies on the Factors Concerned in the Ripening of Cheddar Cheese	Hastings, Evans, and Hart	July, 1912
26	Studies in Dairy Production	Woll	October, 1912
27	The Manufacture of Cheddar Cheese from Pasteurized Milk	Sammis and Bruhn.	December, 1912
28	Avian Tuberculosis	Hastings and Halpin	March, 1913
29	Nature of the Changes in the Solubility and Availability of Phosphorus in Fermenting Mixtures	Tottingham and Hoffmann	May, 1913
30	Calcium and Phosphorus Supply of Farm Feeds and their Relation to the Animal's Requirements	Hart, Steenbock, and Fuller	February, 1914
31	The Control of Damping-off Disease in Plant Beds	J. Johnson	March, 1914
	CIRCULARS OF INFORMATION		
38	Wisconsin Bankers' Agricultural Contests	R. A. Moore and Hatch	June, 1912
39	Directions for Vaccinating Against Hog Cholera	Hadley	July, 1912
40	Distribution of Licensed Stallions in the Counties of Wisconsin During 1912	Alexander.	September, 1912
41	The Milk Sedim't Test and Its Applicat's	Baer	September, 1912
42	Chemical Analyses of Licensed Commercial Feeding Stuffs, 1912	Woll	April, 1913
43	Commercial Feeding Stuffs and Fertilizers Licensed for Sale in Wisconsin, 1913	Woll	March, 1913
44	Analyses of Licensed Commercial Fertilizers, 1913	Woll	April. 1913
45	Distribution of Public Service Stallions Enrolled in the Counties of Wisconsin During 1913	Alexander	September, 1913
46	Commercial Feeding Stuffs and Fertilizers Licensed for Sale in Wisconsin, 1914	Strowd	May. 1914
47	Chemical Analyses of Licensed Feeding Stuffs 1914	Woll and Strowd	June, 1914
48	How to Rid Our Farms of Weeds	Stone	June, 1914

C. Agricultural Extension Service

The work of the Experiment Station is only half done when an important method is devised or a discovery is made. To render this result effective and of use, it must be applied. The printed reports and bulletins reach only a small proportion of the total farming body. Their suggestions and injunctions make their impress usually on only the more progressive individuals. The most effective way to secure the application of the scientific results of Experiment Station work to field practice is through the medium of actual demonstrative work carried out on the farms of the state. This has been attempted through the organization of a special division of the college known as the Agricultural Extension Service. During the past biennium the work of this service has been greatly expanded. The farmer who cannot come to the college has reaped the advantage of the work done, through the fact that the college has gone to him, but in doing so, it must be remembered that no small part of the increased expense of the University has been occasioned by the development of this state-wide service in which the people of the state have immediately and directly participated.

Smith-Lever Extension Bill

As rapid as has been the expansion of the Extension Service in the past three or four years, it is doubtless true that the further development of this work in the immediate future will be even more rapid than it has been in the past. The passage of the Smith-Lever bill by Congress in June, 1914, giving federal aid to the agricultural colleges for co-operative extension work in agriculture and home economics is doubtless destined to exert as strong an influence on the organization and development of this work as did the passage of the Hatch and Adams acts on the research activities of the experiment stations. There is grave danger that this stimulus will result in an over emphasis to this work, and during this period of organization, it is especially necessary that well matured plans be made to minimize as much as possible the unavoidable errors which are likely to occur where rapid expansion obtains. The Smith-Lever bill gives to each state of the Union an initial sum of $10,000 annually. Supplementary funds, as stated below, are available, which amounts

are increased annually for a period of eight years, provided the state appropriates for specific agricultural extension purposes an amount equal to that furnished from federal sources for all sums in excess of the initial $10,000. This supplementary federal appropriation consists of $600,000 for the next fiscal year, which amount is to be divided among the several states of the Union, in the proportion which the rural population of each state bears to the total rural population of all the states. These sums are to be still further increased by additional federal appropriations each year thereafter, for a period of seven years, by a sum exceeding by $500,000 the sum appropriated for each preceding year, and annually thereafter. This makes in all, a federal appropriation amounting in nine years to $4,580,000 annually. On the basis of the last federal census it will be possible for Wisconsin to receive at the end of nine years from July 1, 1914, an appropriation aggregating $109,700 annually, provided the state meets the federal appropriations dollar for dollar after the first $10,000. These funds can only be used for definite extension projects in agriculture and home economics which are first approved by the United States Secretary of Agriculture.

Expansion of Extension Service by Legislative Provision

Hog Cholera. The continued spread of hog cholera in the state and the inability of the college to meet the extraordinary demands made upon it for hog cholera serum led the last legislature to make special provision for this work. For the present biennium there was appropriated $2,500 per annum, in order to extend the serum plant. The legislature authorized the manufacture of serum and its sale at one cent per cubic centimeter, which is substantially the actual cost of production. Even with these increased facilities, it has frequently been impossible to keep up with the demand from the farmers for protective system to be used in their herds.

Seed Inspection. The inadequacy of the present statutes relative to the examination and inspection of agricultural seeds also led the legislature to make provision for the appointment of a field inspector who would inspect and test seeds as exposed for sale in the open market to determine their purity and viability. The result of this law has enabled a much more energetic campaign to be made, and cases have already been prosecuted and

convictions secured where misbranded and adulterated seeds had been sold.

State Soils Laboratory. Numerous demands are made on the Station for the examination and analysis of soils which cannot with justice be brought under our Extension Service, as they are for substantially commercial purposes. Many intending purchasers and land owners desire to know more nearly the real value of lands prior to purchase or expenditure of moneys for their improvement. To meet this need, the last legislature established the state soils laboratory, making an appropriation of $2,000 annually for its maintenance, in addition to the payment by the owner or occupant of the land, of prescribed fees for the field examination and chemical analysis of such soils. The total expenses of the laboratory to the end of this fiscal period have been $1306.38; the receipts $307. This laboratory was not organized until the year 1913–14, but already 237 requests have been received from 90 different communities for such examination. One hundred and forty-seven farms have already been visited and sixty-eight complete reports rendered. The results of these tests have proved of much value to the owners or occupants of the land. In a number of cases poor field results have been shown to be due to an exceedingly low phosphorus content, which condition has resulted from soil exhaustion, as shown by comparison with adjacent virgin soil samples. The relation of acidity to legume growth and soil fertility has also been given special attention. The field examination which is made of the farm takes into account all matters influencing fertility, and emphasis is laid upon the fact that fertility is dependent upon farm management, as well as the character of the individual types of the soil.

In connection with this work, numerous meetings have been held with groups of farmers where their special interest in the analytical results made it possible to combine the work of the laboratory with the extension service in a peculiarly valuable way.

Marsh Reclamation Work. The last legislature also modified the drainage law relative to the reclamation of wet lands, requiring the Agricultural College to make a report upon the quality of the soil, the advisability of draining the area involved, the probable benefits from the proposed work, the probable cost of construction, and the probable distribution of benefits among the

several parts of the district. Under the regulations approved by the Regents, a deposit fee is required of any district or locality organizing under the terms of this law, this deposit being used to defray the actual field expenses incurred in complying with the legal provisions. The work of the college in securing and presenting to the farmers interested this necessary data has made it possible for these communities to act more intelligently on the question as to whether the proposed benefits were of sufficient value to warrant the expenditures incurred in such work.

County Agricultural Representative System. The new line of extension endeavor organized during the last biennium by this college, and known as the county agricultural representative system, has been materially expanded and strengthened during the present period. When this work was first organized, it was on a tentative experimental basis, but the passage of the Potts bill by the last legislature gave specific sanction to the development of this system of locating resident representatives of the Agricultural College in the several counties in the state. We have denominated these resident instructors as agricultural representatives rather than specialists, advisers, experts, or agents, terms by which they have commonly been known in most of the states where the system has been inaugurated. They are urged "to consult" with the farmer rather than "to advise" him. They do not pose as experts but are the educational middlemen who represent the Agricultural College, and are located in the field for the specific purpose of being in close contact with the man who does not take advantage of the opportunity of securing information by correspondence, but who is willing to ask for help, if there is someone who perhaps can aid him in the solution of his problems.

While the legislature was willing to increase the number of representatives beyond that asked for by the Regents, it was thought wise to limit this number at the outset as was finally done, because of the difficulty of securing thoroughly qualified men to assume these most exacting and responsible positions.

This form of agricultural extension service has since met with rapid acceptance in a large number of the different states, but in the development of the Wisconsin plan, two unique features have been incorporated which, in our judgment, are of fundamental importance in the development of the work on a permanent basis.

First, it must be kept in mind that this system is founded primarily for educational purposes, and that its greatest effect on the community will be produced through a close relationship with the usual educational forces, quite as much as through the aid which is offered to the mature farmers themselves. To tie the work of the county representative to the educational life of the community, he is detailed to give the instruction in agriculture in the county training schools of the several counties in which such work is organized. In this way it has been possible for him to develop personal relations with many of those who are to become immediately the rural teachers in these counties, and who are required by law to give instruction in agriculture.

The development of the county short course in agriculture for the farm boy who has either finished or left the district school, and thus lost his connection with continued educational progress, has also proved to be of material educational value.

The second distinctive feature is that this county agricultural work shall be supported by public taxation. In most states this work has been initiated by local or outside contributions, but we have felt from the beginning that it was not wise to trust to the reed of private philanthropy or personal support, but that this type of service should be founded on the basis of a publicly supported institution. The initiative in this work always rests with the people. If they do not wish to tax themselves for this purpose, the work is not organized. The University is merely the agent to carry into effect the wishes of the individual county when the legally constituted authorities of this political unit—the county board of supervisors—decide that they desire to take advantage of the opportunities offered. The entire cost to the county is so small—from $1000 to $1200 or $1300 annually—that the burden placed upon any individual taxpayer amounts to little. The appropriation of this sum by the county makes available automatically a state appropriation of $1000 per county, the responsibility of the selection of the representatives resting with the Regents of the University.

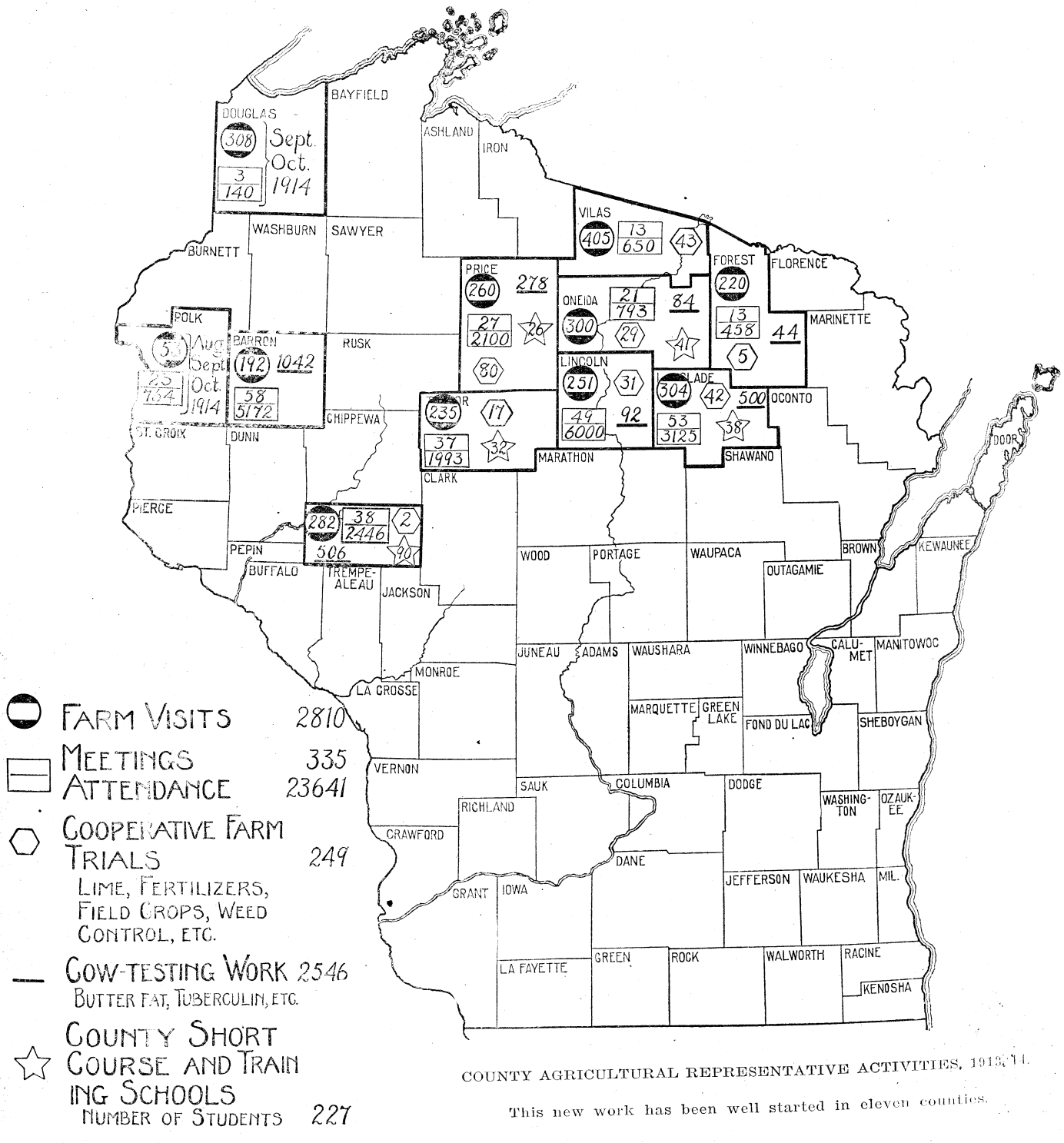
At the end of the last biennium representatives were at work in only three counties. At the end of this biennium nine men were installed in the following counties: Oneida, Eau Claire, Barron, Price, Langlade, Lincoln, Forest, Taylor, and Vilas. Polk county has voted the money, and a representative was selected to begin here August 15. A number of other counties

have either already voted to establish a representative, or are seriously considering the plan. According to the terms of the Potts bill, six additional representatives can be established after January 1, 1915. So far all of the requests have come from the counties in the northern half of the state, although such counties as Eau Claire and Barron represent old, well settled regions. The results already attained in this service have been exceedingly gratifying. The general feeling is that this latest effort of the Agricultural College to get in the closest possible touch with the man on the soil is destined to be the most successful mode of approach yet tried. If we can maintain the high standards that have so far been followed in the selection of representatives we have little to fear from the practical workings of the system.

Additional Lines Newly Organized

Co-operation with State Bankers' Association. During this biennium the station has developed a co-operative plan with the State Bankers' Association and has established what are known as Bankers' Pure Bred Seed Circuits as a new agency for the dissemination of pure bred seeds which are acclimated to the various portions of the state. Prizes are offered at the first contest held by the local banks in any town for the best products of the ordinary varieties raised in the neighborhood and at this contest pure bred seed is distributed by the college. At the contest held the second year a comparison of the ordinary and pure bred types makes an excellent object lesson. Sixteen such contests have been held each year of the biennium, with an aggregate attendance of 16,575 persons. During this last year the Bankers' Association has started the publication and distribution of the Wisconsin Bankers' Farm Bulletin which is issued each month and distributed at cost to the various state bankers for individual distribution among the farmers in their communities. Already over 90 banks are distributing more than 30,000 copies per month of these leaflets, the text of which is prepared by members of our college staff.

Alfalfa. Special efforts have been made during the last two years to start the propaganda through the state regarding the cultivation of alfalfa. The college has co-operated with the Wisconsin Experiment Association in forming an Alfalfa



FARM VISITS 2810

MEETINGS 335
ATTENDANCE 23641

COOPERATIVE FARM TRIALS 249
LIME, FERTILIZERS, FIELD CROPS, WEED CONTROL, ETC.

COW-TESTING WORK 2546
BUTTER FAT, TUBERCULIN, ETC.

COUNTY SHORT COURSE AND TRAIN ING SCHOOLS
NUMBER OF STUDENTS 227

COUNTY AGRICULTURAL REPRESENTATIVE ACTIVITIES, 1913-14.

This new work has been well started in eleven counties.

Order of that association which now has a membership of 700. Co-operative trials have been in progress in all parts of the state to determine the influence of various methods of seeding, the necessity for the application of lime to correct the acidity of the soil, and various cultural methods, including inoculation of the soil. While twenty years ago this forage crop was practically unknown in the state, there are now grown over 35,000 acres. This last year the college co-operated in the purchase of large quantities of seed for members of the Alfalfa Order, enabling them to secure high quality seed at a very material saving. Over 25 tons of seed, worth $9,000 were thus purchased and distributed to members at a saving of over fifteen per cent.

Potato Work. Wisconsin stands near the head as a potato growing state. The opening up of large areas of virgin soils in the central and northern portions of the state has resulted in a material expansion of this industry. In extending and improving the culture of the potato in the state, Professor Milward has paid special attention the last two years to the development of community centers which will do for the potato industry what the Community Breeders' Associations have done for dairy cattle improvement. Effort is being made to secure the co-operation of growers in these various localities in raising standard types of potatoes so as to permit of the marketing of car lots, for which it is possible to secure higher prices than for mixed stock. Interest in potato culture has also been greatly increased through the organization of a State Potato Growers' Association, of which Professor Milward, who has devoted much time to the development of the plan, is secretary. The results obtained from the "Potato Special" educational train, together with the meetings of this society, in which the college authorities have been co-operating, has done much to place the industry upon a much firmer footing than heretofore. The attempt will be made this year to introduce a method of field inspection and certification which will be of special importance with potato stock that is used for seed. Wisconsin has unequalled opportunities for the production of healthy, high quality seed stock, with especially good markets in the South and West.

Marketing Problems

The work of the Agricultural Economics Department has been materially expanded this biennium through the development of research work on marketing problems. At the specific request of the State Board of Public Affairs, special funds were provided to undertake certain studies that were deemed essential in laying a proper foundation for the development of the state's policy in this direction. Much data has been collected on the marketing of potatoes and cheese, including both the cheddar and foreign types made in the state. In the matter of organization it has been deemed the proper policy of the college to concern itself with the accumulation of adequate data on such economic problems, so as to give the necessary scientific basis for a constructive policy of development by the business interests concerned. The establishment of the proper criteria for standards, brands, etc., is legitimately an educational function, and as such should be made by the educational interests of the state. The organization of co-operative enterprises, the federation of business units, must of necessity rest largely upon the initiative of commercial interests. The state, if it assists in this function, can do so better through a regularly constituted board, such as the Board of Public Affairs, than through the college. As an illustration of the general principle may be mentioned the efforts of the college made in connection with the State Board in formulating the necessary requirements with reference to the application of a state cheese brand for the Sheboygan County Cheese Producers' Federation.

The problems relative to rural credit have also received special attention this last year. Considerable effort has been spent on the determination of the actual conditions which exist not only in the well developed rural regions of the southern part of the state but more particularly how much the new settler in the northern part of the state has to pay for money he borrows.

Farm Contests. Through the generosity of Ex-Governor Hoard in furnishing a fund, a state farm contest was inaugurated last year by Professor Otis to determine the relative profitableness of dairy farms where business records were

kept. Over 175 farmers from ten different counties entered the preliminary county try-outs, at which all contestants met to study the comparative results. The three highest in each county competed in a state contest at which the awards were made. An unusual amount of interest has developed among the participants in this contest, as the application of accounting methods has stimulated many of them to a careful study of their own problems. Such demonstration work with reference to the business end of farm problems cannot but be of great value. Arrangements have been perfected for the wider extension of this work next year.

Farmers' Institutes

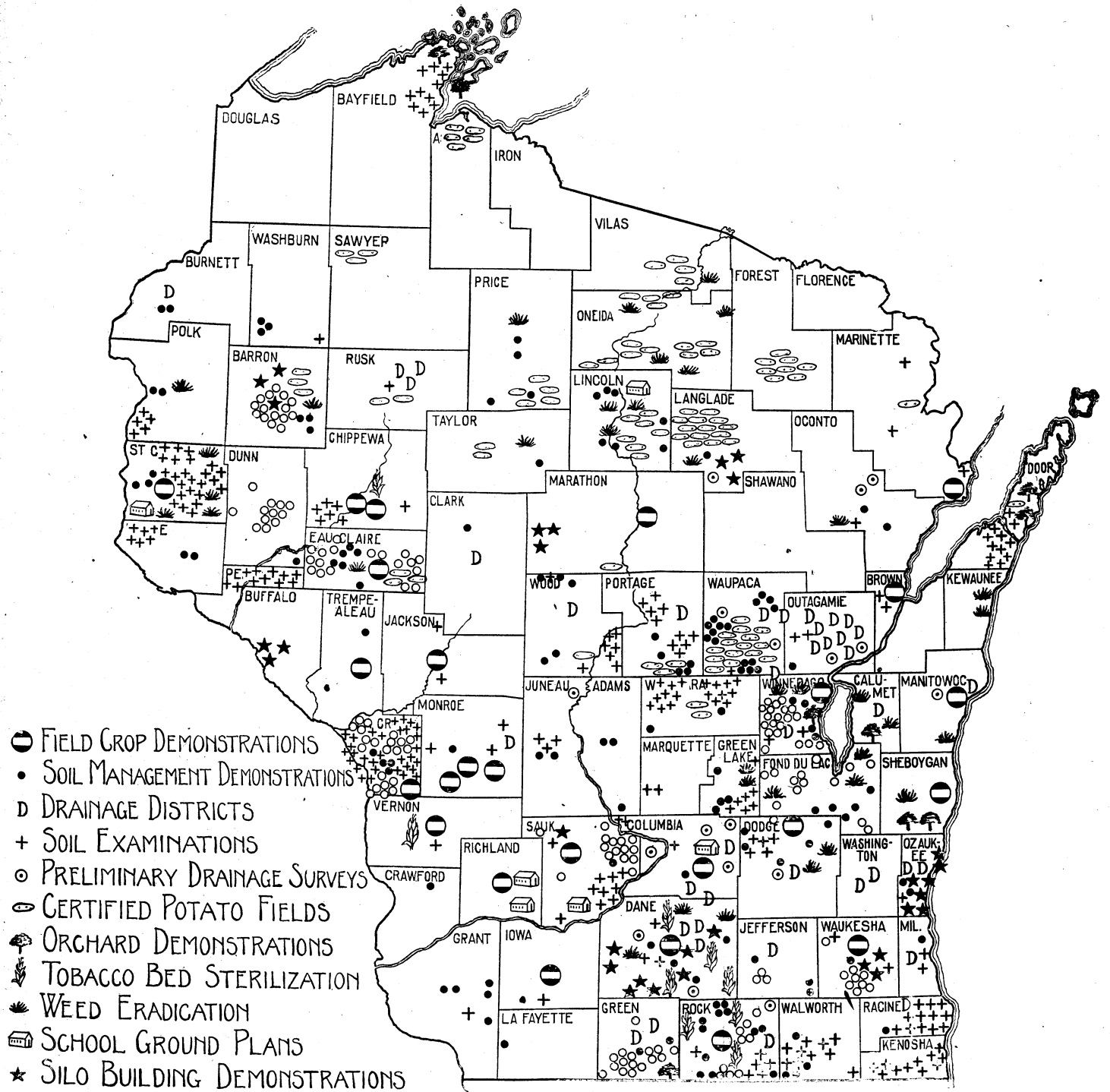
This year brings to a close twenty years of service of George McKerrow as Superintendent of the Farmers' Institutes. This period has been marked by a general growth of the institute idea, which historically may be regarded as the progenitor of the modern agricultural extension principle. Acting in accordance with the plans announced by Mr. McKerrow at the beginning of the year, he tendered his resignation to take effect June 1, 1914. Professor C. P. Norgord, of the Agronomy Department, who has had charge of various phases of our agronomic extension work, has been selected as his successor.

Normal Institute. The most important new feature in connection with the operation of the Institutes this biennium has been the inauguration of a Normal Institute held here at the college at which all of the Farmers' Institute and Extension workers were gathered together for a series of conferences lasting one week. At this Normal Institute the subjects which were to be emphasized during the winter campaign were especially considered, and efforts made to bring before the conference worker graphical methods of illustration which might be adopted by them in their meetings. The result of this has not only harmonized the work of the field instructors as between themselves, but has tended to unify the field teaching of these workers with the experimental results secured by the college. During this last year, at the request of the Regents, a faculty committee has been appointed to consider the formulation of policies as related to the Farmers' Institutes.

Under the new administration of the institutes, the old established type of farmers' institutes conducted by practical farmers will be continued, but in addition thereto, efforts will be made to organize special feature institutes for the consideration of special topics of timely importance, these to be held during the summer as well as the winter. Some of the work connected with the educational trains will be transferred to the Farmers' Institutes, as well as crop demonstration work on the county and state farms, heretofore conducted under the direct supervision of Professor Norgord.

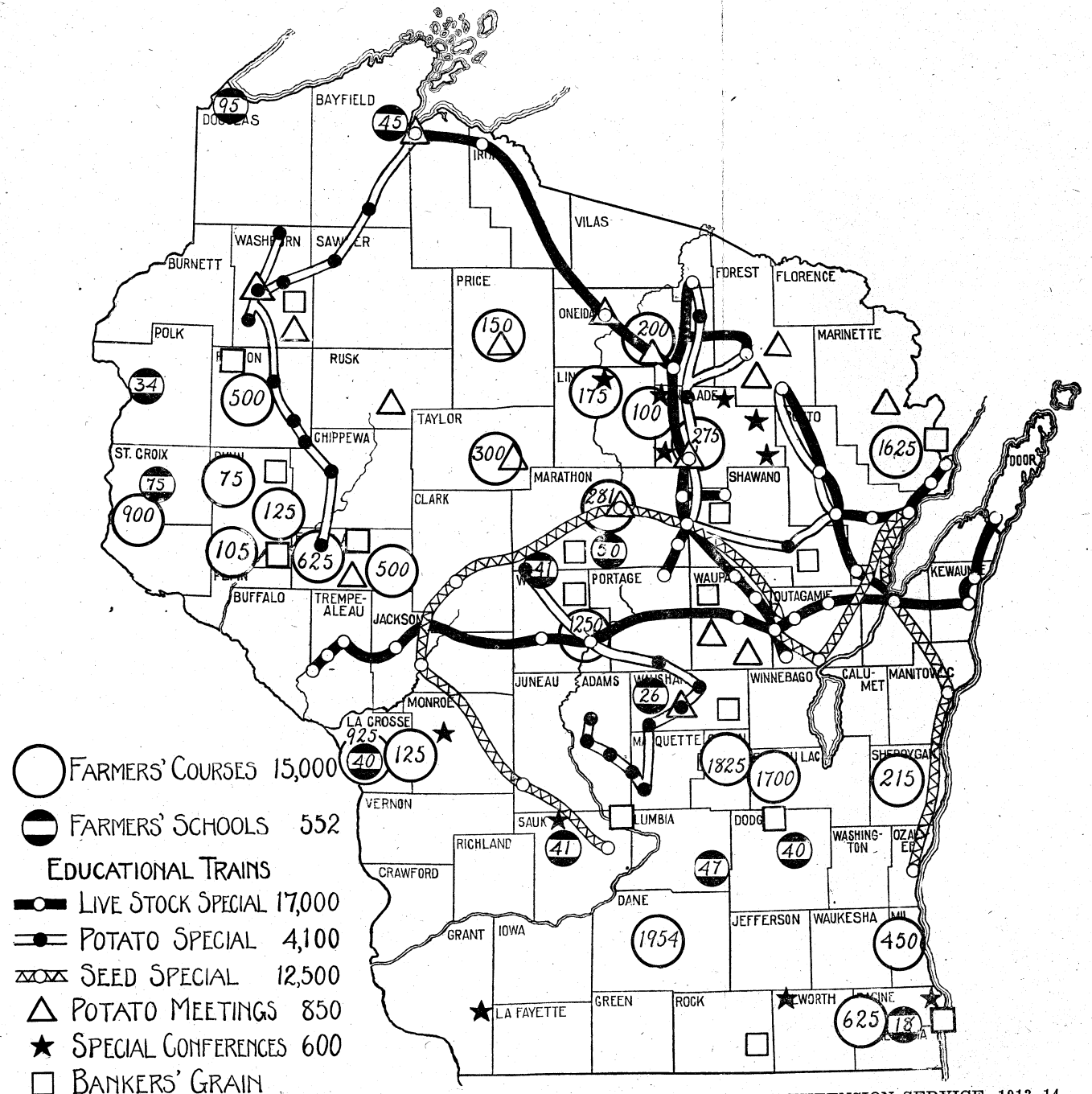
Other Lines of Extension Endeavor. The above lines have been inaugurated this past biennium and represent only the new phases of extension endeavor. The various projects that have been in operation for several years have all been continued, but as the results obtained are available each year in detailed form in the Director's Report of the Experiment Station (see Bulletins 228 and 240), reference is here made only in summary form.

Professor Humphrey has organized 8 more community live stock breeders' associations, making 83 such organizations in all to date. Professor Norgord held 17 demonstration meetings on the county and state farms where various lines of work are in progress on field crop improvement. Improved grains distributed through the medium of the county school superintendents were placed in the hands of over 20,000 school children each year. The winners of the corn contests held at the county fairs are brought to the University in February. Eighty-six boys were in attendance in 1913 and 154 last winter. The Agricultural Bacteriological Department has made and turned over to the Live Stock Sanitary Board over 100,000 doses of tuberculin in the last two years for use in testing dairy herds to reduce bovine tuberculosis. The demonstration field work on the use of fertilizers, especially phosphate and potash, and the application of lime to correct acidity and inoculation for legumes has been continued and extended by the Soils Department. Similar extension work by the Horticultural Department has been maintained on the spraying of orchards for control of fungous and insect pests. The official testing of dairy cattle for production records has now reached proportions four times as great as it was four years ago.



FIELD DEMONSTRATIONS OF COLLEGE OF AGRICULTURE, 1913–14.

These demonstrations are a most successful method of bringing the results of investigation to the farmer.



COLLECTIVE ACTIVITIES OF AGRICULTURAL EXTENSION SERVICE, 1913-14.

During 1913–14 over 58,000 persons were reached directly in the collective extension activities of the College of Agriculture.

II. ADDITIONS TO RESOURCES

BUILDINGS

The main additions to buildings for the use of the college in this last biennium have been the Agricultural Chemistry and Home Economics structures.

Agricultural Chemistry. The Agricultural Chemistry building is a reinforced concrete structure, costing $90,000. It consists of a main structure 66′ x 108′, which houses an auditorium of 353 seating capacity, with a three-story wing, 51′ x 132′, which is used largely for laboratory purposes. The completion of this building has permitted the removal of the Agricultural Chemistry Department from the central agricultural building and will take out of a non-fireproof structure a number of laboratories in which the fire hazard is high. Besides housing the chemical laboratories for all phases of chemistry as applied to agriculture and home economics, the recently organized Department of Forestry and the Poultry Department will also be assigned quarters in this building. The attic will be used as a permanent exhibit room for the display of the educational exhibits which are made annually at the State Fair.

Home Economics Building. This building will house not only the Department of Home Economics, which has been heretofore crowded in the attic of Lathrop Hall, but temporarily the offices of the University Extension Division as well. It is a five-story structure 131′ x 45′ with a four-story wing, 91′ x 47′8″. The Home Economics Department will occupy the entire wing and a portion of the main structure. The completion of this building will give some relief to a department that has been greatly handicapped for the last three years.

Library Stack Room. This fall our exceedingly valuable agricultural library will be housed in the new fireproof quarters which have been provided by the addition of a two-story wing 25′ x 50′, which is attached to the auditorium and library unit of the central agricultural building. This fireproof stack room is sufficiently large to include not only our present library, but will furnish necessary space for a number of years to come. The removal of the present book stacks in the agricultural reading room will permit of an enlargement of this space. Altogether

this improvement is one of greatest moment to the permanent work of the college, as it has been a source of much concern to keep these valuable collections under conditions where the fire hazard is as great as it is in the central agricultural building.

The transfer of the Department of Agricultural Chemistry to its new quarters has permitted a reassignment of space in the main building which has materially improved the working facilities of a number of the departments. Expansion of the bacteriological laboratories has been made especially necessary by the transfer of a large part of that work in Letters and Science to the new quarters provided in this building. The facilities of the Departments of Agricultural Economics, Experimental Breeding, Animal Husbandry, Veterinary Science, and Agricultural Journalism have also been materially improved through this rearrangement of space.

The transfer of the old swine barn to the Department of Experimental Breeding for expansion of its work in research and teaching lines necessitated the construction of new quarters for the Swine Department which was built in the summer of 1913. During this year it also became necessary to construct additional quarters for the use of the Veterinary Department in the manufacture of anti-hog cholera serum.

Branch Experiment Stations. The three branch experiment stations located upon the sandy Jack pine lands at Spooner, the Lake Superior red clay at Ashland, and the fine grained Colby silt loam at Marshfield were all established prior to this biennium, but the facilities at these stations have been materially improved during this biennium. At Spooner and at Ashland, when these stations were established, they were located on cut-over lands, and much effort has been required in clearing and subduing this land to get it in shape for use. At the Spooner station a cottage has been built for the foreman, an addition made to the barn for the housing of a dairy herd, and a large concrete potato warehouse completed for the storing of our seed potato crop. At Ashland a foreman's cottage and one barn, as well as a commodious office plant for laboratory purposes have been constructed. The station at Marshfield was formed from the union of two separate farms. Considerable moving and repair work has been done and a new forage barn constructed this last year. At all of these branch stations additional facilities by the way of buildings will also be required, but it is to be hoped

that these can be added from time to time as resources will permit. What has been accomplished within the short space of time since these areas were taken over as a waste of blackened stumps warrants a reasonable expansion as facilities will permit.

County Demonstration Stations. Chapter 624, Laws of 1911, authorized the establishment of three county demonstration stations to be maintained jointly by the county and the state on which purely demonstrational work was to be carried out, which would be of value to the respective localities in applying suitable methods for the farm problems in any particular section. The Douglas county station was located on the red clay type of soil in the city of Superior in 1911, 20 acres being leased for this purpose. In 1912 this was extended by the further lease of 13 acres additional, and on this station satisfactory crops of clover, pea, wheat, and other grains are being grown.

The Rusk county demonstration station was located in 1912 at Conrath on the Kennan clay loam. As this section is in the early pioneer stages of farming and the settlers are actively interested in dairy development, a small dairy herd has been added to this station for demonstration purposes.

The third county station was organized in 1913 in Marinette county, the location being made on the site of our old sub-station at Crivitz, 53 acres of land being leased for this purpose. The results accomplished on this dominant type of sandy soil have been such that the people of the county were very glad to avail themselves of the opportunity to establish a demonstration station rather than to see the work of the old sub-station abandoned.

III. THE NEEDS OF THE COLLEGE

A. Constructional Requirements

Equipment of Soils Building. While appropriations were made by the last legislature for the construction of a wing to the Soils building and plans have been prepared for the same, the contracts for the erection of the structure have not yet been made. The postponement of the realization of these plans is seriously interfering with the efficiency of the work of the department. With the constantly increasing number of

students who are compelled to take this required work as sophomores, the problem of housing the same becomes increasingly difficult. The allotments made so far only concern the building itself. The estimates of $58,000 will not cover the necessary incidental expenses of construction, such as architect's fees, grading, heating during construction, and the necessary equipment to enable the building to be utilized. No estimates of such expenditures have yet been made.

Plant Industry Building. The largest and most important need of the college which should be considered this year is to increase the facilities for plant industry work as embraced in the Departments of Agronomy and Plant Pathology. When the Agronomy building was constructed some eight years ago, a serious mistake was made in erecting a building for this important department which was so small that its capacity was wholly utilized from the time the department moved in. Structurally the present building is of such form that it cannot be economically enlarged. The one lecture room in this building, which has a capacity for less than one hundred fifty, is too small to hold several of the classes of the department, so that in recent years it has been necessary to repeat the lecture instruction to the different sections in the laboratory. The character of much of the laboratory work is such that table space is needed where the laboratory material can be left on the student tables through the several class periods. Now the one laboratory has to be cleaned up between class periods as several different types of work are carried on in the same laboratory. The department needs considerable space for the storage of laboratory material in the form of sheaf grains, forage crops, as well as seed grains. This material should be adjacent to laboratories where needed and to be readily available should be classified and stored under vermin-proof conditions.

Office room in the present building is altogether inadequate. This year it was absolutely necessary to cut up the large laboratory to make offices for the new men in the department.

The Seed Inspection work has all developed within the past three years. No provision whatever was made for this work when the building was constructed. This work has now grown to be of much importance. During the rush season in the

early spring eight to ten workers are required to handle this important branch of the state's service.

The work of the Experiment Association is all carried on from this center. Provision should be made for the utilization of the exhibit material which would be available from the annual exhibitions of this association. A commodious exhibit space for such material would greatly add to the value and importance of this work and enable much valuable material now incapable of utilization to be made available.

The work of this department has been of inestimable value to the upbuilding of the agriculture of the state. Its importance is such and the need for adequate quarters so imperative that the consideration of this problem should receive the attention of this coming legislature.

The situation in the Department of Plant Pathology is substantially the same. This department was only organized four years ago. Temporary quarters were assigned to it in the general administrative building, but it was apparent after the first year that larger quarters would be necessary. When the Horticulture building was planned this department was assigned the upper floor of this new building with the expectation that these quarters would be sufficient for some years. Before the building was occupied it became necessary to change the plans and finish the attic in order to accommodate the general work of the department. At a small cost very fair quarters were here provided for this work, but the increase in number of students has again reached such proportions that we are now in a condition where further growth will seriously interfere with the quality of all of the work done in the department.

The student enrollment alone since the organization of the department indicates the necessity of increased facilities. Total student registrations have increased from 23 in the year of organization (1909–10), to 211 in 1913–14. The number of advanced and graduate students has also greatly increased, until now the department has more advanced work than any other department of the college.

The situation with reference to greenhouse facilities is as badly congested as is laboratory and class room space. Much of the investigative and advanced student work has to be done under conditions of thorough control, which is only possible un-

der glass. These facilities moreover should be in physical contact with the laboratories, as is the case with the present pathologium. But these quarters have long since become inadequate and in providing for the future this requirement should be kept in mind. In making further provision for the plant disease work, it should of course be understood that the present facilities of the department would be utilized, except so far as the natural growth of the horticultural work would require some additional space in the present building.

When it is recognized that plant diseases impose an annual tax on production of probably at least ten per cent of total values, that American science in this field leads the world in its application to agriculture, that the department we have is recognized as unequalled by that in any other institution in this country, it seems wise to plan our development so that most efficient results can be secured. Not only does the crowded condition of the department greatly interfere with student work but the research work is also greatly handicapped. Pursuing the policy of setting graduate students on applied problems of economic importance to the state, it has been possible to increase materially the amount of work accomplished. The experimental results obtained by the department have been of greatest possible value to the agricultural interests. The pea canning industry, in which Wisconsin occupies the foremost position (as we pack over forty per cent of the entire output produced in America), has been rescued from threatened destruction by the discovery of methods of controlling the pea blight. Cabbage culture in the truck regions of the southeastern part of the state has been largely abandoned because of "cabbage sick" soil, *i. e.*, disease-infested land. Through the development of resistant strains of commercial varieties, the return of this industry to the lake shore regions is now possible.

To secure the necessary facilities for these two departments as here presented, it seems most feasible to add a wing to the present Horticulture building. The obvious advantage of this arrangement would be to concentrate most of the plant industry operations of the college under one roof. In this way the three departments of Horticulture, Plant Pathology, and Agronomy could use the larger lecture rooms in common, thus materially increasing the utilization of such space. Such a structure should be three stories in height, including the base-

ment, and if constructed in a manner similar to the agricultural buildings recently built will permit of utilization of the attic, in addition to the three floors, for class room or laboratory purposes. For the purpose of these two departments 32,000–35,000 square feet of floor space is needed which at the ordinary cubage rate would require $85,000 for the building. The necessary equipment for these two departments would in this case be relatively less than would generally be required for a new building, as substantially all of the present agronomic equipment can be utilized.

In this connection the question may be raised as to what use would be made of the present Agronomy building. The Agricultural Economics Department which now occupies the east portion of the fourth floor of Agricultural Hall is expanding very rapidly in its work. By far the larger part of their work is statistical in character and at present they are in a non-fireproof building with no vault space available on this floor. The danger from fire is always present and with their records thus exposed it is a source of constant anxiety. It seems entirely feasible to assign the fireproof Agronomy building to this department. This building could be utilized by this department with a minimum change in internal arrangements, as there is no expensive laboratory plumbing to tear out or install.

Abattoir. For some years, we have considered with the Animal Husbandry Department the feasibility of introducing a course into our curriculum on the slaughter of animals and the curing and handling of meats. From the standpoint of animal nutrition, the crucial test of different feeding methods can only be determined by the "block test," *i. e.*, how the animal cuts up for food purposes. The constantly rising price of animal products is also making more important the question of preparing on the farm the meat supplies for the home. Our students should be given the opportunity to learn how to dress a carcass, cut up the same for food, and the utilization of by-products. The Home Economics Department requires material on which to demonstrate the different "cuts" of meat from the different food-producing animals. Along these various lines we are able to do practically nothing at present where control of conditions can be had. The product of such work might be utilized by the commissary departments of the University. Nine colleges of agriculture now offer courses of this character in all of which the

work is popular. A small abbatoir with facilities for chilling and holding meats of all kinds would serve the needs of the Departments of Animal Husbandry, Poultry Husbandry, and Home Economics. Such a structure need not be of expensive construction. An expenditure of $5,000 to $8,000 would probably suffice to build and equip facilities sufficient for this purpose.

Greenhouses. With our rapidly increasing student growth the necessity for greenhouse space for winter instruction operations becomes much greater. The Horticultural Department asks for two 100-foot houses, while for the work of the Agricultural Chemistry and Economic Entomology departments together an additional 100-ft. house is needed. To these needs should be added the necessary greenhouse space to be attached to the proposed building for Plant Pathology and Agronomy. These latter structures, however, could hardly be constructed until the new building was built, but glass house space will be urgently needed here in a year at most. Of the above needs, however, two 100-ft. houses should certainly be available for the fall of 1915. These would be attached to our present group of glass houses, thus economizing in heating and control.

Farm Buildings. For years there has been a strong demand for the enlargement of our beef herd, but so far the small herd we have had has been kept in the basement of the old horse barn. With the rising price of meat-producing animals, it is becoming much more profitable for our farmers to give more attention to beef production, and the demand is becoming more insistent for adequate expansion of this phase of our animal husbandry work. In the future constructional work, it had always been the plan to construct a beef cattle barn, but a more economical arrangement is here proposed. We can utilize more completely the old horse barn for this purpose, converting into suitable stable quarters the first floor, in addition to the basement which is now used for the present herd. This will necessitate the removal of the carpenter shop and vehicles to other quarters. Our machinery quarters are inadequate to store under cover our farm machinery and it is proposed to construct a wing to the present wagon shed that will permit of the storage of heavy machinery and vehicles closer to the horse barn where they will be much more convenient. The present tool barn could then be turned into a repair shop, in which the blacksmith and carpenter shops could be housed together.

The present dairy stable houses 34 animals. We have about 50 dairy animals besides the young stock, and Professor Humphrey recommends very strongly that the herd be increased by the addition of not less than 25 to 30 more cattle. These animals are needed primarily for instructional purposes, as our classes are increasing rapidly, but fortunately they can be made to pay their way by the sale of their product at highly remunerative prices. With the prestige which Wisconsin enjoys in dairying, it is absolutely necessary that we maintain at our Agricultural College as good facilities in our own specialty in Animal Husbandry as our neighboring colleges. Several of the agricultural colleges of the Mississippi valley now possesses superior facilities in this field for instruction and research to those which at present obtain with us. With this expansion of the dairy herd it will be necessary to increase the capacity of our dairy stable. The estimate for this improvement is approximately $8,000.

Next year it will be necessary to make some provision for housing the experimental herd that is being developed by Professor Cole and the Animal Husbandry Department in inheritance and experimental breeding work. This can be done by reconstructing the west wing of the Experimental Breeding building so as to make it conform architecturally to the sheep barn, or the transfer of this experimental work to the Hill or the Eagle Heights farm. In either case provision will need to be made for proper quarters.

Nothing whatever has yet been done with the farm buildings on the Eagle Heights farm. When the University took over this land the farm was in a badly run-down condition. No fields were fenced and it was impossible to keep stock on the same because of the open fields and lack of buildings. We have now fenced several of the fields in a permanent manner, and with the construction of a common farm barn we could house and pasture a good deal of our young stock on this farm, which would help to restore its fertility, and relieve the congestion at the University barns. For this purpose there should be expended about $4,000 for a forage and stock barn and other outbuildings like those which have been built at the Hill farm.

Some four years ago we made a modest start in poultry husbandry. Altogether, in our experimental and instructional plants we have expended for construction less than $8,000. This department has proved to be very popular, and the request of the department for moderate additions to its resources for incubator

quarters, additional small houses, and adequate fencing, aggregating $2,000, is well worthy of support.

Branch Experiment Station Buildings. The work at these stations has now been continued for several years and has so thoroughly commended itself to those sections of the state served by these agencies that the success of this movement is well assured. The pioneer work of establishing two of these stations on raw cut-over land has been accomplished so far at a comparatively small expense. The buildings erected have been only those absolutely necessary to house the force and make a start toward a farm. To begin this work the legislature made a specific appropriation of $2,000 a year for three years. The balance necessary for the remainder of construction and equipment has come from the annual allotments from the Regents.

The work of these Branch Stations has now assumed such importance in the development of the state that adequate provision should be made to put these stations in a position to serve fully the needs of their communities in a way that will utilize as completely as may be, the resources of the same. Additional buildings for the housing of machinery, grain, and forage should be provided, water systems installed so that running water can be had in the house as well as in the barn, and additional equipment in the way of tools, machinery, and live stock secured. With our system of management in which in place of a superintendent on each station, the executive work is assigned to a member of the staff engaged in research work on the station, the overhead expense incurred is exceedingly small. In fact, the total expense for capital and operation in the case of these three stations is very much less than our neighboring states, such as Minnesota and Michigan, are putting into development work on their cut-over lands in the northern part of these states. Minnesota is spending from $13,000 to $15,000 annually, and has invested over $100,000 already in buildings and equipment for their two-branch stations in the "cut-over" territory at Grand Rapids and Duluth.

There is no question but that the state as a whole is likely to profit in a large measure and more immediately through this developmental work than in almost any other way.

There are many problems that we have as yet been unable to consider at these Branch Stations, because of lack of facilities. Even in the case of animal production, it is impossible to solve

satisfactorily all problems here at Madison. Thus, for instance, feeding experiments, involving housing of stock, should be carried out on the soil types peculiar to these regions so as to secure data to show the most profitable methods of farm management.

To place these three branch stations on an adequate footing to enable thoroughly satisfactory work to be done, the regular operating budget should be materially increased. We spent for operation last year between eleven and twelve thousand dollars. This should be increased at least to fifteen thousand dollars annually. In addition to this, considerable new construction should be provided for that cannot well be taken from current funds. Additional barn and stable space is needed at Spooner and Ashland. No facilities for storage of unthreshed grains have yet been made. More land should be cleared. When this is done, fencing is needed. Also the equipment of all three branch stations as to tools, machinery, and stock should be enlarged. For such expenditures on capital account and new construction at least six to eight thousand dollars is needed for each year of the biennium. As this expenditure is wholly for state development and not student interests at the University, it would be entirely legitimate and preferable from some points of view, if a specific state appropriation were made for the further equipment and operation of these stations.

B. Necessary Staff Expansion

No new departments have been organized during the past biennium, except that relating to the work in forestry, but efforts have been made to strengthen the lines of work already in operation. The rapid growth of the teaching work and the unusual demand for men trained in agriculture makes the problem of securing an experienced teaching staff increasingly difficult. Moreover, the expansion along extension lines, as stimulated by the Smith-Lever bill, has still further greatly intensified the demand for men. This phase of our work will undoubtedly continue to expand rapidly as the value and worth of this service becomes better known, but for the most part the necessary funds for the growth of the Extension Service will be met by federal appropriations available under the terms of the Smith-Lever bill.

It is impossible to forecast the teaching needs, except in part,

because the number of students is now increasing so rapidly, but considerable elasticity should be had in this direction to enable the departments to secure needed instructional help when occasion arises.

Plant Pathology. The rapid development of the plant pathological work along research lines will require the addition of a permanent staff member. So far this department has not engaged in the extension activities, but the demand for this service has been so insistent that in justice to the needs of the state, provision should also be made for an experienced instructor to undertake this work.

Horticulture. The very rapid growth of the potato work necessitates additional assistance for Professor Milward. The same situation obtains with reference to orchard extension work.

Experimental Breeding. Professor Cole has carried for several years both the teaching and experimental work in Experimental Breeding. This department has now reached a position where a permanent additional staff member should be supplied.

Economic Entomology. As yet no provision has been made for specific assistance for research work in Economic Entomology. The magnitude of the problems in this field and their practical importance should lead to an energetic development of the research field in this direction.

Forestry. While an excellent beginning has been made in the forestry work, through the development of the Ranger Course, yet the resignation of the department chairman, and the uncertainty as to the future forestry policy of this state, has made it impossible to organize this department as effectively as was hoped. When the decision of the Supreme Court is handed down this fall with reference to the problems now before that tribunal, it is to be hoped that the forestry policy of the state can be more definitely outlined and that definite plans can be made.

Home Economics. Much relief has been experienced by the Home Economics Department with the occupancy of their new building this fall, but as the completion of this structure has been delayed over a year and in this interim the department has continued its exceedingly rapid growth,* it is apparent that

* Enrollment for fall of 1914 shows an increase of almost 40 per cent over last year.

the time is not far distant when even further constructional needs will be imperative.

With the enlargement of the staff, especially through the appointment of two additional professors, the work of the department has been differentiated, as is detailed in the report of the Director of that course.

Extension Service. The organization of the county representative system, *i. e.*, the establishment of resident extension instructors in the several counties of the state has proved most successful. Legislative provision was made two years ago for ten such representatives for 1914 and sixteen for the following year. Applications were early received for the full quota and well qualified men were finally selected for this important work. The success of the work is such that there is no question but that practically all of the counties that have already taken up this movement will be heartily in favor of its continuance. The probabilities are that the quota available for 1915 will all be taken early in the year. It will doubtless be necessary to secure modifying legislation that will permit of the further development of this system, but in doing so, it is to be hoped that the maximum number of counties in which this work is authorized will not be made too large. It is our belief that provision can easily be made for twenty in 1916, and not to exceed twenty-five for the next year of the biennium. The problem in this work that is hard to solve is not with reference to the co-operation of the county, but to find properly trained men who are sure to succeed in this most difficult relation. Residing permanently as these men do in the counties which they serve, they have got to live with the possible errors which they may make. As representatives of the University, they bear a degree of responsibility that is much more than would be the case if connected only with the public school system of the community.

So far the County Representative System has only been applied to farm problems, but the problems of the farm home are equally pressing and in the no distant future, we should be rendering community aid to the farmer's wife as well as to the farmer himself. I do not think this aspect of the subject is yet organized sufficiently well to warrant at the present time the installation of county women representatives, but I do be-

lieve that the time is now ripe for beginning this work on a wider basis. My recommendation would be, if the County Representative law is amended this winter, that it include provision for the appointment of at least two women representatives at large whose entire time can be given to field work on the problems of the farm home.

Farmers' Institutes. Among the changes to be made in the Farmers' Institutes with the inauguration of a new superintendent is the transfer of the demonstration work on the county and state farms which has heretofore been carried on by Professor Norgord, and the development of the educational trains.

In my last report I referred to the crop demonstration work which Professor Norgord has so successfully developed and recommended that he be given additional assistance. With his duties as Superintendent of Farmers' Institutes, and as manager of our Hill farms, it is impossible for him to give adequate personal attention to the organization of the demonstration work on these state and county farms. Nowhere are we able to get as valuable results for so little expenditure as is being done in this work. Each of these twenty odd centers throughout the state has become a well recognized location for the dissemination of not only improved seed stock but a demonstration point for better farm practices. This year the needs of the women have also been thoroughly met by the assignment of Professor Kelley from the Home Economics Department, who has attended with Professor Norgord a large number of his demonstration meetings. I heartily endorse the request of the Superintendent for an increase of $2,500 in the funds available for the Farmers' Institutes work to enable this new line of summer effort to be carried on most effectively.

Branch Stations. Reference has already been made to the results that are being secured at these important centers in the northern and central portions of the state. The further constructional and equipment needs of the branch stations are there set forth. With the growing amount of general executive and extension activities which the departmental men, who act in an executive capacity, are obliged to meet, it would be highly advantageous to the research work of these stations, if we could locate staff members at some of these points who could devote their time uninterruptedly to the experimental work.

Present Fiscal Policy Hampers Investigation

In connection with our experimental work along practical feeding lines, it should be possible for the station to feed considerable numbers of live stock on a practical scale, in order to be able to advise the farmer on relative costs of production where different methods are employed. Under the present financial plan all moneys received from sale of farm products, other than milk, are required by law to be deposited in the State Treasury and cannot be used as a revolving fund for the continuance of such experiments. This restriction makes it difficult to continue any practical tests of this character, as the amounts involved for purchase of such stock make so large a draft on the operating budget. In this respect, we are therefore placed at a great disadvantage in comparison with other experiment stations of the Mississippi valley, all of which are able to use the proceeds arising from the sale of such stock for the continuance of similar experimental work. Efforts should be made this year to modify existing legislation so as to include such operations in our revolving funds, the same as milk and other dairy products.

H. L. Russell,
Dean.

REPORT OF THE DIRECTOR OF THE COURSE IN HOME ECONOMICS

Dean H. L. Russell,
College of Agriculture.

Dear Sir: I have the pleasure to submit herewith the biennial report as Director of the Course in Home Economics.

The Department of Home Economics which has just completed its fifth year in the College of Agriculture has continued to grow steadily, as shown by the following table.

	Home Econ. Course	L. & S. Students	Graduate Students	Summer** School	Total
1910-1911	100	96	1	26	223
1911-1912	134	159*	1	78	372
1912-1913	168	96	0	114	378
1913-1914	205	200	8	170	578

* Elections in other colleges not restricted to juniors and seniors.
** Students electing one or more courses in Home Economics.

Educational Standards. The course of study has been developed along the educational theory that during the freshman and sophomore years the student should acquire a broad foundation in the use of English and at least one foreign language and the beginning courses in such sciences as seemed most nearly fundamental, namely:—chemistry, physics, physiology, bacteriology, and zoology. With this end in view there are but three courses in home economics offered during these years and but one elective, which the student is advised to take in either literature, economics, history, or biology.

This policy has made it possible for normal school graduates to enter and complete our course in five semesters, or two years and a summer session. It has also made it possible for students

who desire to attend for the first two years any of the smaller colleges in the state to do so without penalizing them too severely. This, in a measure, meets the desire of parents to place their daughters in a more cloistered environment during later adolescent years.

The entrance of students from other institutions on advanced credit standing, has grown so that today over fifteen other colleges and universities are contributing students who enter for junior and senior work. In a similar way we have graduate students who come desiring to gain advanced standing or a broader view of the teaching phases of the work.

There is a slowly increasing number of junior and senior Letters and Science students who elect from one to five courses in an endeavor to gain a broader foundation for their future work in the home, a few only, electing to take a teaching minor in home economics. To this end we offer throughout the year one course which has no science prerequisites and one course in applied design which is fundamental for all other applied design studies. With the beginning course in foods this gives a fair review of the home problems so that the future home keeper is not so seriously handicapped. In 1914 the senior course in Humanics was opened, on attendance standing, to seniors in Letters and Science. This gives a review of the laws of child development and care in home, school, and state in the belief that it may help in the training to a better standard in citizenship in the future. About fifty seniors from Letters and Science elected the course.

Majors in Home Economics. Up till the year 1913–14 the course in Home Economics offered no major other than the general one which endeavored to fit the graduate not only for life but for professional work in teaching either or both domestic science and domestic art in the high school or normal school, or food or textiles in the college courses in home economics.

In 1913–14 the course was broadened so that while the freshman and sophomore work is obligatory the student may, in the beginning of the junior year, elect a major in either food or textiles, thus giving a more intensive study to the work without limiting the scope of the electives in other colleges. It is the policy of the department to develop in the near future, majors in institutional management, dietetics, housing, hospital administration, vocational instruction, and to co-operate with the Depart-

ment of Sociology in offering minors to those equipping themselves for social service work.

Summer Session. In the Summer Session the courses offered and the instruction given while in part a duplicate of those in the collegiate year are adapted to the needs of teachers in grades and high schools. With our law demanding vocational instruction in the States there has come the demand for technical courses which will fit the teacher to meet more nearly the demand for trade methods in instruction. That in our millinery and dressmaking courses in the Summer Session we have anticipated this need is demonstrated by the fact that owing to lack of adequate laboratory space the mailing lists in 1913 and 1914 have been very long.

In the new building the clothing laboratories will accommodate but 192 a day. Even with this number we must provide at least four instructors to adequately handle these two courses in our Summer Session in 1915. While the demand in the Summer Session for courses in food and housing is not so great as for courses in clothing, yet that it is a steadily growing one is shown by an increase of nearly 40 per cent in 1914 over the numbers in 1913.

Up till now our instructional staff has met the Summer Session demands but beginning with 1915 we must secure instructors from without as the exhausting nature of the work demands more adequate vacational recuperation than the few weeks between summer session and work in the fall. The strain of continuous teaching from September to August is too great to be borne year after year.

The compensation in the summer session budget allowance will need to be greater as instructors of equal value cannot be secured at the salaries paid to our own teachers.

Extension Service. The department has, in co-operation with farmers' courses organized by the College of Agriculture, given a series of one-week extension schools during which lectures and demonstrations were given in home economics subjects. The demand for these was met in as far as possible through the work of the one woman extension worker, one-third of whose time we command, and such of the instructional staff as could be more easily spared. This has meant a distinct sacrifice in efficiency in both lines of work. In 1912–13 ten such courses were given and

in 1913–14, fifteen, that being all that could be carried under the old organization.

In 1913–14 three one-week schools in home economics were given, two in connection with the Farmers' Extension Schools and one in response to a call from the women of a village and farm community.

Every year between the two semesters in February a two-week course for women has been held at the University. That this meets a very insistent demand is shown by the fact that the attendance in 1914 was over 800.

The departmental staff, with the aid of one other lecturer has carried this work in addition to conducting the semester examinations, preparing reports and registering students for the second semester. As the number to do the work is small, it has meant that each home economics instructor must be on duty every minute of what to other members of the University faculty is a short vacation in which the work for the coming semester is organized. Even with additions to the extension staff under the Smith-Lever grant, this strain cannot be relieved as they are not permitted by law to work at the University.

This coming year there are to be two full-time extension workers, one one-third time, and two special lecturers, who will give such service as the Smith-Lever fund will support in addition to the fixed charges for the regular staff. This will enable the following lines of work to be developed throughout the state during the biennium:—extension courses in home economics; one week schools; extension clubs for young people, as sewing clubs; canning clubs; poultry clubs; pig clubs.

In affiliation with the Director of Farmers' Institutes, who provides two lecturers in home economics subjects, it is expected that the speakers in all of these lines of home economics extension work in the College of Agriculture may be so utilized that the expense of travel may be reduced to the minimum consistent with efficiency. To this end, one-fourth time of an executive clerk will be given to perfecting the distribution of speakers so that all demands may be met within the limits of the Agricultural and Home Economics extension staff.

Other lines of extension work of the department which have been met in part are the request for club study outlines, reference reading and club lectures, and the request for expert opinion through correspondence. This has added to the work

of administration and has borne most heavily on the Director as she must, with the limited number of instructors, do full teaching work in addition to executive duties.

Changes in Instructional Force. The growth of the work has necessitated an additional corps of instructors. While in 1911–12 the work was carried by six and one-half instructors, in 1913–14 the limited increase in teaching force, four instructors, made it impossible to do justice to the demands. Each instructor has worked more than full time, willingly, but if high grade work is continued, this overstrain must be relieved. For the year 1914–15 the increase in staff is only 19 per cent upon a calculated increase of students in 1913–14 of 42 per cent. For the coming year the increase in juniors and seniors is such that we can provide for them, but in 1915–16, judging by our present enrollment, we will have very much larger classes which we cannot handle with our present instructional staff.

The staff has lost in the biennium through resignation and marriage two instructors only. It has gained in the year 1913–14 one and two-thirds instructors, and one member of assistant professorial rank; in 1914–15 two instructors and two assistants; and, in pursuance of the policy followed in all other courses of maintaining a balance between instructors and those of professorial rank, the department staff has been increased and made stronger by one assistant professor in extension work under the Smith-Lever bill grant, and one associate professor who gives her full time to teaching in the advanced course in food.

In 1913, Professor Celestine Schmit, formerly of the Milwaukee Trades School was appointed assistant professor, in charge of vocational courses in home economic education.

In 1914, Professor Amy Louise Daniels, formerly chairman of the Department of Home Economics in the University of Missouri, was appointed to relieve the Director of some of the courses in nutrition and dietetics and to develop lines of research work in phases of home economics subjects.

In 1914, Professor Elizabeth B. Kelley, state supervisor of home economics education in Louisiana, was appointed assistant professor in charge of Agricultural Extension in Home Economics.

These additions to the staff will meet the needs for the year 1914–15 but in the following year there must be such increase in number of instructors as will adequately handle the beginning

classes and the possible development of a Short Course in Home Economics similar to that now offered in agricultural and dairying.

Research Work. If we are to take our place in the advancement of the home, we must provide opportunity for research work to be carried on by the staff and graduate students equipped for such investigation.

Testing or standardizing work, not alone to determine purity, but to determine hygienic and financial worth, has been done even under our present condition of lack of facilities.

That there is a growing demand for textile standardization; evaluation of food products as to food value and technique in their preparation and adequate comparative study of labor saving apparatus, is shown by letter and personal interviews. The department will gladly undertake this work when equipment and workers are available, thus doing for the homes, both urban and rural, what agriculture is doing for the farmer. With this should come the issuing of bulletins, popular and research, to meet the evergrowing demand from the housekeeper.

FUTURE WORK

Extension. We must in the near future plan to meet the demand for trained experts in home economics who may do for the farm home what is now being done by the County Agricultural representatives for the farmer and the farm boy. This is being done by other states and we are receiving calls for trained women to fill their positions.

A second need is for rural nurses who shall be available in the same way as the County Agricultural Representative. It may be possible to combine the training necessary in home economics, nursing, and medicine, thus having one home economics representative do both kinds of work.

The work of Dr. Dorothy Reed Mendenhall which proved so valuable last year in community institutes is to be continued in the rural one-week schools in home economics where the need of the knowledge of fundamental principles in preventive medicine in the care of the young is so vital.

Short Course in Home Economics. The request has been made by the men in the Short Course in Agriculture that there be

given a short course in homemaking for women so that their sisters and others could have the same privilege as the men enjoy.

In the last report the Dean of the College of Agriculture speaking of this need stated:—"It is hoped that it will be possible to organize this work when the new building for Home Economics is completed." If we are to assume this new work, more space, more instructors, and a larger budget will have to be provided.

Vocational Graduate Work in Home Economics. It is recognized by all thoughtful educators that we need more technical training for our teachers if they are to equip the child in the future to meet the industrial demands of life. At the same time we recognize the harm which comes from too early specialization in undergraduate work. Therefore to meet a very pressing demand has come the Summer Session courses. As this time is too short to accomplish the object, it has seemed wiser to the department staff to ask that an additional six months' or a year's study following graduation be offered to those who wish by intensive work on one or two technical subjects to become as efficient as the teachers trained for vocational work in France, Switzerland, Belgium, or Germany. At the completion of such training and on the recommendation of the staff, a teacher's certificate in vocational education may be granted.

Course in Fine Arts. Courses in technique require more detailed preliminary training in art and in design. The art courses offered in the University are negligible except as are found in applied design in Home Economics and in the Manual Training Department.

If we are to build up in this state a demand for a sensible and adequate solution of the clothing and housing problems, we must meet the situation by introducing courses in pure and applied art.

The department is suffering because of this lack and must put such courses in the College of Agriculture, if the College of Letters and Science where they belong cannot see its way clear to meet the demand.

A course in life drawing followed by applied art courses in costume design can be organized in the Course in Home Economics with but slight cost for equipment and for the present one additional instructor in applied design, thus allowing Miss Grady to develop the cast and life class work and later the costume design class, both of which are fundamental in costume study.

Housing and Equipping the Department. The department today is provided with the following rooms in the new Home Economics and University Extension building:—

1 Lecture room,
1 Class room,
2 Food laboratories,
2 Applied chemistry laboratories,
1 Dietetic laboratory with practice kitchen and dining room adjoining,
1 Weaving laboratory,
A Textile laboratory,
A Dressmaking laboratory,
A House Architecture and House Decoration laboratory,
An Art and Design laboratory,
1 Applied Arts laboratory.

In the Practice Cottage there are the following rooms with equipment:—

Living room,
Library,
Dining room,
Kitchen,
Laundry,
Store room,
Furnace room,
3 Bed-rooms,
1 Bath.

Registering students in anywhere from two to four different home economics classes means that space in laboratories is at a premium. In lecture rooms we have been, and will be, very much handicapped as the one large lecture room is seated for 237 only, and the art and design apartments, where at present there is a lecture room, will in the next two years be required for laboratory classes. Aside from these there are two class rooms seating 24 each. Thus, what two years ago, when the new building should have been ready for occupancy, seemed adequate lecture room is now a limited space for even the present requirements. Unless there is a marked decrease in percentage gain, the Home Economics and University Extension building will not

meet the needs of the department for more than the coming biennium.

The Home Economics and University Extension departments are expanding rapidly; therefore there is already need for planning additional room which must be met either by building the new wing or constructing an entirely new building for the Extension Department. The latter solution is, in the opinion of your Director, the more advisable because it will meet the needs of both departments at a minimum of expense.

There is need of space and equipment in the department for smaller laboratories for advanced and research work in dietetics, textiles, household management, etc.

In the matter of office rooms the number is such that there are, with but three exceptions, from two to three instructors in each room. This crowding prevents such close supervision and friendship with students as is advisable for character development, as will be readily understood by anyone who realizes the handicap which the presence of a third person places upon young students who come for a conference.

The Practice Cottage which is equipped to provide a laboratory in which dietary and house management studies may be made more nearly practical, is now inadequate to meet the present demand. A dietary study should continue from five to seven days and yet the number of students is such that three days is all that each group may remain in residence. A practice suite should be placed in the Home Economics building to meet this demand.

The present laboratories will suffice for space for only two years more reckoning on the most conservative growth along old lines.

One of the new courses, Institutional Management, organized during the last two years, has proved so valuable, and the demand for practical laboratory work is so imperative, that having, in the opinion of the Steward of the University Commons, outgrown the opportunity for practice in connection with the central kitchen and dining rooms, it becomes necessary to plan some other place to be used as a practice laboratory. Five years ago the department was asked by a group of Short Course men to give some help in solving the living problem, at least in the way of wholesome food. It was promised then that in the future, if possi-

ble, a dining room would be planned much on the lines of the one in the Kansas Agricultural College where students in Institutional Management and in the short courses could plan, purchase, prepare, and serve the meals to the men taking the college work. In either the basement of the central part of the Home Economics and University Extension building or in the basement of the proposed new wing there could be organized such a dining room, service room, and kitchen which in size and equipment would meet the needs for the students in institutional management; and, if such a course is organized, the students in the short course in home economics could use it.

Your Director feels keenly that the need of increasing the staff, the housing and equipment of the department which has shown the largest growth of any in the University in the past five years merits the attention and the generosity of the state.

Respectfully submitted,

A. L. MARLATT,

Director, Course in Home Economics.

REPORT OF THE DEAN OF THE COLLEGE OF ENGINEERING

President Charles R. Van Hise,
The University of Wisconsin.

Dear Sir: I herewith submit my report as Dean of the College of Engineering for the biennial period from 1912–14.

FACULTY

During the past two years there have been an unusual number of changes in the instructional staff, especially among the members of professorial rank. To the great regret of the faculty and alumni, C. F. Burgess, Professor of Chemical Engineering, who had been a teacher in the University for twenty-one years, resigned his professorship in 1913 in order to devote his entire time to professional engineering practice. The Department of Chemical Engineering has been placed in charge of Associate Professor O. L. Kowalke. W. D. Pence, Professor of Railway Engineering, was appointed in 1913 as a member of the board of engineers created by the Inter-state Commerce Commission to aid it in determining the value of the railway property of the United States. Professor Pence was granted leave of absence for the year 1913–14, and again for the year 1914–15, in the hope that at the expiration of this time he would decide to return to the University. While greatly regretting the absence of Professor Pence, the University may well feel honored by his selection for this important work. During the absence of Professor Pence, Assistant Professor L. F. Van Hagan has charge of the Railway Engineering Department. C. C. Thomas, Professor of Steam and Gas Engineering, resigned his position in the summer of 1913 to accept the professorship of the new Department of Mechanical

ngineering at Johns Hopkins University. Professor H. J. Thorkelson has been placed in charge of this department. F. T. Havard, Associate Professor of Metallurgy, who had been with us about four years, was taken from us by death in the spring of 1913. Although he had been connected with the college a comparatively short time his work had come to be highly valued and his loss is greatly felt. To fill this vacancy Richard S. McCaffery, formerly Professor of Mining Engineering at the University of Idaho, was appointed Professor of Metallurgy in February 1914. In 1912 Assistant Professor George J. Davis, Jr., of the Department of Hydraulic Engineering, resigned to accept the position of Dean of the Engineering Department at the University of Alabama. This place was filled by the appointment of Assistant Professor C. I. Corp, previously a member of the faculty of the University of Kansas. Is 1913 Associate Professor Edward Bennett of the Electrical Engineering Department was promoted to a full professorship. In the same year Mr. R. C. Disque, instructor in electrical engineering, and Mr. J. B. Kommers, instructor in mechanics, were promoted to assistant professorships in these departments. In addition to the above mentioned changes, there have been resignations of a number of high grade instructors for the purpose of accepting positions elsewhere at larger salaries.

ATTENDANCE

The attendance in the College of Engineering for the past five years has been practically stationary, varying in this period from a maximum of 807 in 1910–11 to a minimum of 678 in 1912–13. In 1913–14 the attendance numbered 738. A condition of practically stationary attendance has been common in engineering schools throughout the country for the past few years. Some schools show a small decrease and others a small increase. Considering the very rapid increase in the number of engineering graduates, which took place during the ten years preceding 1908, and the lessened activity in new enterprises which has now existed for the past two or three years, it is to be expected that the attendance in engineering schools should show fairly stationary conditions. In some directions there have been new or increased demands for technical men. This is notably true in the

field of highway engineering, owing to the favorable legislation recently enacted in several states. This is an illustration of the way in which new lines of work are continually developing in which technically trained men are needed.

A noteworthy feature regarding new students entering during the past two years, is the increased number of those who enter with advanced standing, amounting now to about twenty-five per cent of the total. The number entering from normal schools of the state has become very considerable and will doubtless increase in the future.

INSTRUCTIONAL WORK

In 1912-13 the Engineering faculty took up at considerable length the question of revision of the curriculum, especially with regard to the number of hours required of freshmen and sophomores. As a result of this study some modifications were made in all of the courses. The principal changes were; (1) a reduction of the amount of work required in the first two years by from one to three hours per week; (2) an increase in the number of elective hours in the later years of most of the courses; and (3) an alternative program which permits those students who present a certain minimum of language preparation to omit the subject of foreign language, if they desire, and take other studies in its place. In order to gain this privilege, the student must present three units of one foreign language or four units of two or more foreign languages. It is believed that this arrangement will encourage the study of foreign languages in the high school and so enable the engineering course to be made more flexible. About forty per cent of the freshmen are now able to present the required amount of foreign language to permit them to take advantage of this arrangement.

The effect of the reduction in the amount of work can hardly be judged as yet, but statistics of the work of the freshman class of last year show a distinct improvement over the work of the year before.

Another change which was made at the same time was to discontinue the five-year arrangement, under which a student could receive a professional degree in five years, without having first taken a baccalaureate degree. Experience with this arrange-

ment led the faculty to the conclusion that if, in the one case, a five-year course is made liberal by the introduction of a large amount of general studies, the degree granted should not be the professional degree, but rather the B. S. degree, or perhaps both the A. B. and B. S. degrees; and that if, in the other case, the five-year course is made relatively technical, it is preferable to arrange it so that a student may get his B. S. degree at the end of the four years and then secure his professional degree as a graduate student. With an increased number of electives arranged in the various four-year courses, it would appear that there is now ample elasticity to meet all requirements.

The subject of highway engineering has recently assumed a position of much greater importance than formerly by reason of recently enacted legislation in this and neighboring states. Much of the highway work is now under state control so far as the engineering features are concerned, and this facilitates the organization of efficient engineering corps. These conditions have made it desirable to extend the courses in highway engineering in the University and to improve the laboratory equipment. Considerable expenditures have been made in this direction and the laboratory is now, in most respects, fairly satisfactory. Further expenditures, however, are needed.

In the Department of Topographical Engineering the subject of city surveying and street design has always received considerable attention. This work has recently been developed under Professor Smith into the broader and more important field of city planning, which is of very wide general interest. A large amount of valuable material on this subject was collected by Professor Smith from European sources during the first semester of 1913–14.

Instruction to students in agriculture and manual arts, which is given by this college, has increased greatly in the past two years and is adding considerably to the demands upon our shop facilities. Commencing this year, a short course in highway engineering will be given by this college to students in agriculture as an elective study.

RESEARCH WORK

The research work of the college during the last biennium has continued on about the same basis as during the previous period. Five University bulletins have been published from the Hydraulic Engineering Department on flow of water through orifices and channels and on pump and water wheel tests. This department is now engaged on a study of the efficiency of low lift pumps such as are used in cranberry marshes. The Department of Steam and Gas Engineering has published a bulletin on the subject *"Tar Forming Temperatures of American Coals"*. Other important results of research work from various departments have been published elsewhere. From the Chemical Engineering Department several papers have been published in technical periodicals and society transactions, among them being papers on *"Iron Pipe used as Electrical Conduits"*, *"A Study of the Annealing Processes for Malleable Castings"*, *"A Microscopic Study of Electrolytic Iron"*, *"Sources of Air in Gas Calorimetry"* and papers on the electrical deposition of iron and zinc. Two very important papers were presented by members of the faculty before the American Society of Mechanical Engineers, one on the subject of *"Friction of Shaft Bearings"* by Professors Thomas and Maurer, and one on *"The Measurement of the Flow of Air"* by Mr. Rowse, formerly an instructor here. The work on air measurement is being continued by the Steam and Gas Engineering Department, which department is also carrying on special work on the flow of steam, and friction materials for brakes. The Department of Mechanics is continuing the extensive study of concrete sand and gravel deposits of the state which was begun three years ago. This work is being utilized in a very practical way in the selection of materials at different points in the state. This department has also carried on for many years a series of tests on the permeability of concrete. The results were recently presented by Professor Withey before the Western Society of Engineers.

Several departments are co-operating with national societies and state organizations in their research work. The Department of Mechanics is co-operating with committees of the American Concrete Institute and the American Society for Testing Mate-

rials. The work for the latter committee consists in an exhaustive series of tests to determine the durability of clay and cement drain tile. The Department of Chemical Engineering is co-operating with the American Society for Testing Materials on the subject of paint. The Structural Engineering Department is also continuing its co-operation with the American Railway Engineering Association on the revision of bridge specifications. Several of the departments have rendered considerable service during the past biennium to the railroad and highway Commissions. In 1913 the Electrical Engineering Department, in co-operation with the railroad commission, organized a standards laboratory for the purpose of providing facilities for the testing of electrical instruments for various public utilities of the state. During the year 1913, 134 tests were made and in the first half of the year 1914 the number was 113. This service is paid for at rates agreed upon by the University and the railroad commission. This work is proving to be of very considerable service to the people of the state in helping to improve standards of service, and is also of considerable advantage to the University in the additional facilities provided for accurate standardization in University laboratory work.

THE ENGINEERING EXPERIMENT STATION

For several years this college has been granted a special fund of from $4,000 to $6,500 to assist in the conduct of research work in the various departments. Under this provision a very considerable amount of work has been accomplished, as has been duly reported. The question of a more definite organization of this work was discussed from time to time by the Engineering faculty, and, as a result of this, it was recommended to the Regents last February that this research work be organized under the title of "The Engineering Experiment Station". The recommendations were adopted by the Regents so that in the future the research work will be administered as an engineering experiment station.

The main advantages of such an organization would appear to be—

1. A clearer recognition on the part of the faculty of the

importance of this work, with a tendency to more regular and systematic provision for it.

2. Better correlation of the work among the different departments.

3. A distinctive name which will gradually give to the work a better standing and wider recognition throughout the state so that the facilities here available for testing and experimental work will more generally be appreciated, and thus render the laboratories more useful to the industrial interests of the state.

4. An organization better adapted to represent these activities in co-operation with similar organizations in other states.

Under the action of the Regents the staff of this experiment station consists of the Dean as Director and of the members of the instructional staff in the various departments of the College of Engineering, together with such fellows, scholars, and assistants as may be engaged in experimental or research work.

An organization of this kind has been in existence at the University of Illinois for nearly ten years and at three or four other institutions for a less period of time. It is probable that in the near future some equivalent organization will exist in nearly all of the state institutions which are supported in part by the federal grants. A national organization of land grant engineering colleges, formed two years ago, will do much to promote the work of such stations.

NEEDS OF THE COLLEGE

The most pressing needs of the college in the way of material facilities will be met by the construction of the new shop building, for which an appropriation was made by the last legislature. By a shifting of laboratories and the utilization of the old shop building for other purposes it is planned to give much needed additional space to the testing and the steam and gas engineering laboratories.

The appropriation of $50,000 for a shop building, above referred to, is the very least for which it will be possible to construct a building for the shops of the College of Engineering. In equipping this building nearly all of the present shop equipment will be utilized as, with few exceptions, it is satisfactory and efficient. However, new and additional motor drives will need to be installed and several items of equipment purchased.

It is also very desirable that the new shop building should provide, under the same roof, adequate space for the shops of the growing Manual Arts Department. To provide for proper new equipment and for a more adequate building there should be available during the next two years an additional amount of not less than $30,000.

I wish here to call attention to the question of more adequate salaries for the teaching staff. During the past ten years this college has lost many valuable men, largely because the general scale of salaries is insufficient. It is practically no longer possible to secure high grade experienced men from other institutions at the salaries we are able to pay; on the contrary we are losing men whom we ought to keep. The salary standard for the more important positions should be raised as soon as possible to at least $4000, with corresponding increases for other positions, as I do not believe that an engineering school can be maintained on a high professional basis on a lower scale than this.

Respectfully submitted,

F. E. TURNEAURE,

Dean, College of Mechanics and Engineering.

REPORT OF THE DEAN OF THE LAW SCHOOL

President Charles R. Van Hise,
The University of Wisconsin.

Dear Sir: I beg to submit the following report concerning the Law School for the biennial period ending June 30, 1914.

FACULTY

The following changes have occurred in the faculty:

Eldon R. James, appointed professor of law in June 1912, resigned June 1913 to accept a professorship in the University of Minnesota Law School.

Ernest G. Lorenzen appointed professor of law in April 1911 resigned in June 1914 to accept a professorship in the University of Minnesota Law School.

William U. Moore, appointed assistant professor in June 1908, professor of law in June 1911, resigned in June, 1914 to accept a professorship in the University of Chicago.

Oliver S. Rundell, instructor in law September 1910, retired in September 1912 to engage in practice.

The other members of the faculty during this period were H. S. Richards, Dean, and Professor of Law; Howard L. Smith, Burr W. Jones, E. A. Gilmore, professors of law; J. B. Sanborn, F. T. Boesel, lecturers in law; A. B. Hall, Associate Professor of Political Science, continued to offer courses in Administrative Law in the Law School.

In the Summer Session of 1912 Professors Gilmore, Lorenzen and Richards of the regular faculty offered courses. Courses were also given by Professor W. W. Cook, University of Chicago, Professor Albert Kales, Northwestern University Law School, and O. S. Rundell, Instructor in law.

During the Summer Session of 1913 courses were offered by Professors Gilmore, Lorenzen, and Smith of the regular faculty, and Professor Wm. E. Higgins, University of Kansas Law School, Professor James P. McBaine, University of Missouri Law School, and Oliver S. Rundell, Esq.

Henry W. Ballantine, A. B., LL. B., formerly Dean of the University of Montana Law School, was elected Professor of Law in 1913 to fill the position made vacant by the resignation of Professor James.

Oliver S. Rundell, LL. B. 1910, formerly instructor in law 1910–12, was elected assistant professor of law in August 1914, and Harold M. Wilkie, Esq., LL. B. 1912, instructor in law to take the places of Professors Lorenzen and Moore, resigned.

During the University year 1912–13 Dean H. S. Richards was absent on leave, the administrative work being in charge of Professor Gilmore.

During the University year 1913–14 Professor Gilmore was absent on leave.

REGISTRATION

The registration for the period was as follows:

1912–13	167
1913–14	169
Summer session 1912	63
Summer session 1913	74

The total registration for the biennium was 473, including summers of 1912 and 1913, which shows an increase over the preceding biennium of sixty-four. The total registration of special or unclassified students during this period was 53 as against 68 for the biennium of 1910–12, and 78 for the biennium of 1908–10.

The registration for the current year shows a still further falling off in this class of students. Two special students were graduated during the biennium on account of their unusual attainments.

The increase in registration though not large has been substantial, and gratifying, when the number of law schools in the vicinity of Madison is considered. The state universities and

private schools in adjoining states have made striking improvements in the last five years, practically all now requiring two years of college work as prerequisite to legal study. The teaching force of these schools has also been increased and strengthened. This improvement coupled with the growing tendency of students to attend the schools in the states in which they intend to practice has narrowed the field from which students are drawn. Taking the country as a whole, the number of professional students is declining, the larger schools showing a falling off or a stationary registration. The Universities of Minnesota and Michigan owing to advanced entrance requirements show a sharp decline in attendance. Indeed, this law school although a pioneer in higher entrance requirements has suffered less than any school in this respect. The number of students under instruction at this school is larger than the figures would indicate, since there are a large number of students registered in Letters and Science who carry less than ten hours of law school work, in consequence of which they are not counted as law students at all. Although it would be possible to accommodate at least one hundred more students without additional expense to the University, the present number of students is large enough for effective teaching, since it makes small sections possible. When a class exceeds thirty-five, individual participation in discussion decreases, and individual responsibility on the student's part noticeably decreases.

The interest on the part of the student and the intensiveness of the work has unquestionably increased during the biennium. Although the number of courses offered and the number of required class hours has increased the outside work of the students along legal lines has developed also.

In addition to the work of the practice court, a number of law clubs are maintained for the discussion of legal questions. A large organization of students devotes itself to the broader aspects of law, and its relation to social and economic problems. During the past year the history of various legal doctrines was traced in a series of papers, and the program of this year contemplates a study of current legal problems growing out of social and economic legislation.

The activities of the members of the faculty aside from their duties as teachers have been largely in connection with such legal bodies as Association of American Law Schools, Section on

Legal Education of the American Bar Association, Institute of Criminal Law and Criminology, and the State Bar Association. Various addresses have been given and articles written which are more particularly set forth in the departmental reports for 1912 and 1913.

Along the lines of teaching the effort is being made to individualize the instruction more by requiring special reports and briefs from the students and conferences concerning such reports. The members of the faculty have been active in connection with the Moot Court and Clubs, suggesting questions and advising with participants. Work of this character has been made possible by the provision made for student assistants, who have proved to be of great service. Courses have been authorized and will be given the coming year in briefmaking and office practice. The former course is designed primarily for first year students to familiarize them quickly with the material with which they must work, proper methods of using digests and other source books, and practice in compiling briefs. The course in office practice is intended for third year students and is designed to give the student a medium for applying in a concrete way his knowledge of substantive law by drawing such common documents as contracts, deeds, articles of business association, corporations and partnerships. This sort of work has been done before in connection with individual courses and included drawing deeds, examination of abstracts, etc. These courses in connection with the practice in pleading carried on in the courses in Code Pleading and Code Practice and the Practice Court give as complete a training in adjective law as can be done effectively in a law school. The faculty is convinced that admission to the bar should be preceded by a period of office study. At graduation the law student, however, efficiently trained he may be, is ignorant of many things pertaining to the art of his profession that renders him an unsafe adviser. No law requires such an apprenticeship in this state, though it is recognized as essential, since a majority of each year's class go into an office of an older lawyer before entering on practice independently. As the result of a rule adopted by the Regents in April 1914 at the request of the law faculty, all students entering after July 1, 1916 are required to serve an apprenticeship of six months in a law office before receiving a degree. The success of this provision will depend on the extent to which members of the bar of the state

are willing to co-operate with the law faculty in making it effective.

The law school should not, and does not, exist for the sole purpose of training practitioners, although that must of necessity be its main function. Young men preparing for business, public life, or service with commissions, should be encouraged to take a part of their training in law, since it is almost indispensable for those who hope to rise to any important post in public service. The law and legal institutions must be reckoned with in every line of public endeavor, and students should go into the subject with sufficient depth to gain a knowledge of legal principles, and to appreciate the legal aspect, and the legal point of view on public questions. One or two courses in public law will not give that knowledge or insight. The commissions prefer men in their service who have this knowledge and the habit of careful analysis that is the product of good legal instruction. Students of this type are not interested in adjective law, or in office experience, but under the present rules, such a man can not graduate in law without this training. By proper co-operation between the Law School and the Departments of Political Science, Economics, and History, a course of study for this class of students could be devised with considerable freedom of election, that would furnish an admirable course of training for public service, and this without any increase of expense to the University. The only possible modification of the present rules involved would be with reference to the major study—and even that is not likely. A degree should be given, no doubt, but since the degree in law admits to the bar, it would not be suitable for the course indicated. Courses to the extent of seventeen hours are now offered in public law, by the Law School. In addition to these, courses in comparative law should be installed, since a knowledge of the principles of continental law is essential to an intelligent study of institutions.

As recorded in the last biennial report, the faculty voted to substitute for the thesis, summaries in public and private law. During the biennium the courses have been given under the title of Jurisprudence, and History of Law, laying special emphasis on the historical origin of important legal doctrines, and their evolution in the face of business and social conditions.

These courses have proved very satisfactory and much more profitable to the average student than the thesis.

LIBRARY

The library is the laboratory of the school, and its use by the students in all departments of the University is steadily increasing. During the biennium about 2000 volumes have been added to the library. The amount available for the purchase of books has been sufficient to enable the purchase of continuations and some small additions that were lacking. Some serious gaps still remain, however, and considerable expenditures should be made over and above the annual appropriation to provide it. The lack of space has been a serious handicap, but this has been solved for some time to come by the authorization of a balcony in the main reading room.

NEEDS OF THE SCHOOL

During the past two years the Law School has lost the services of three experienced professors. These men have been called to neighboring law schools at salaries much in advance of the highest professional salaries prevailing here. In view of the demand for competent and experienced law teachers throughout the country, and the increased salaries being paid elsewhere, it is difficult to secure or retain the services of good men. This school has been fortunate in the men called to the faculty, but unhappily has been forced to give many of them up just when they had reached the full measure of their efficiency and usefulness to the school. The school can not go ahead as it should if it is forced to be a training school for teachers for other schools. It must be recognized that professional school salaries range much higher than those in colleges of arts due to the fact that the men are professional men, and to the great demand for competent teachers in law.

The principal need of the school in the way of equipment now that the library has been provided for, is a substitution of desks for the opera chairs that now form the seating equipment of the main lecture rooms of the law building. Opera chairs were perhaps suitable enough when the instruction was by lecture, but the present methods of instruction requires the student to

take full notes and to bring his books to class. It is impossible to do this work properly or comfortably with the present equipment. The students are constantly complaining of this handicap. Reference was made to this need in the biennial reports for 1908–10, and 1910–12.

Respectfully submitted,

H. S. RICHARDS,
Dean, Law School.

REPORT OF THE DEAN OF THE MEDICAL SCHOOL

President Charles R. Van Hise,
The University of Wisconsin.

Dear Sir: I herewith submit my report as Dean of the Medical School for the biennial period closing June 30, 1914.

I. CHANGES IN FACULTY

Appointments: Paul F. Clark, associate professor of bacteriology, June, 1914; W. D. Stovall, bacteriologist, State Laboratory of Hygiene, January, 1914.

Promotions: H. C. Bradley, from assistant to associate professor of physiology, 1913; W. J. Meek, from assistant to associate professor of physiology, 1913; R. Van Valzah, from assistant to associate professor of clinical medicine, 1913; P. M. Dawson, instructor in physiology 1913–14, assistant professor, 1914.

Resignations: M. P. Ravenel, professor of bacteriology, 1907, and director of the State Laboratory of Hygiene, 1908, resigned June, 1914; L. Shumacher, instructor in clinical medicine, 1911–12, assistant professor, 1912–13, resigned, 1913.

Of these changes in the faculty the most important are associated with the discontinuance of the Department of Bacteriology as a separate department in the College of Letters and Science. Of the work hitherto offered, part is taken over by the Department of Bacteriology of the College of Agriculture and part by the Department of Pathology of the Medical School. To the latter falls the teaching of medical bacteriology and hygiene. This division followed the resignation, in the spring of 1914, of Dr. M. P. Ravenel who came to Wisconsin as professor of bacteriology in 1907 and who was appointed director of the state laboratory of hygiene in 1908. Under Dr. Ravenel's ac-

tive leadership the number of students taking bacteriology increased rapidly and the work of the state laboratory of hygiene was likewise markedly expanded. Dr. Ravenel has done much to promote the cause of public health in Wisconsin. He leaves Wisconsin to assume charge of the work in bacteriology and public health at the University of Missouri. The teaching of medical bacteriology and hygiene has been placed in charge of Dr. Paul F. Clark who has been appointed associate professor of medical bacteriology in the Department of Pathology.

Dr. Paul F. Clark was born in 1882, prepared in the public schools of Portland, Maine, took a Ph. B. degree at Brown University in 1904, an A. M. in 1905 and a Ph. D. in 1909. He was assistant in biology at Brown University from 1904–05, assistant in bacteriology from 1905–06, and assistant bacteriologist, Rhode Island State Board of Health, 1906–07. He was fellow in bacteriology at the Rockefeller Institute for Medical Research 1909–10, assistant 1910–12 and associate 1912–14. For six months during the year 1913–14 he was in the Pathological Department of the Johns Hopkins University.

He has published an intensive study of the diphtheria group of bacilli and has likewise studied intensively the dysentery group, but he is best known for his numerous papers on infantile paralysis.

Dean Bardeen has been appointed acting director of the State Laboratory of Hygiene. The immediate supervision of the work in this laboratory has been placed in charge of Dr. W. D. Stovall, bacteriologist, and E. J. Tully, chemist.

II. STUDENTS

There has been a steady increase in the number of students matriculated in the Medical School. Wisconsin continues to have considerably the largest enrollment of the medical schools which give merely the first two years of the medical course. The following table shows the number of students matriculated in the medical course for the years 1911–12, 12–13, 13–14, and 14–15.

TABLE I

Number of students matriculated in the Medical Course

	1911-12	1912-13	1913-14	1914-15
MEDICAL STUDENTS	**60**	**67**	**82**	**94**
First year	36	32	60	54
Second year	24	34	22	40
Men	58	61	75	89
Women	2	5	7	5
Residents	54	57	62	69
Non-residents	6	9	20	25
Graduates	9	12	16	15
Seniors	29	28	26	41
Juniors	22	26	40	38
PUBLIC HEALTH	**3**	**1**	**2**	**2**
Total	**63**	**68**	**84**	**96**

From this table it will be seen that the number of students matriculated in the medical course has increased 50 per cent in four years. The number of women enrolled remains essentially stationary. The number of non-resident students has increased faster than the number of resident students, but the latter constitute about three-fourths of the total number. In connection with the enrollment of non-resident students in the Medical School it is of interest to note that the tuition and incidental fees for the course are considerably higher than at other state universities, with the exception of California, and are but slightly exceeded at the more expensive endowed universities.* The number of graduate students enrolled in the medical course remains at about 15 per cent.

The number of students not enrolled in the medical course who take work in various departments of the Medical School is greater than the number of students matriculated in medicine. The largest of these courses is that in general physiology, now taken by over one hundred students. Next to this comes the course in embryology in the Department of Anatomy, taken by sixty-five students last year, most of these not matriculated in the Medical School. The course in the Department of Anatomy offered to students in physical education has increased during the past

* California, $185; Colorado, $75; Yale, $200; Illinois, $155; Rush, $185; Northwestern, $190; Indiana, $100; Iowa, $100; Tulane, $195; Johns Hopkins, $220; Harvard, $220; Michigan, $120; Minnesota, $150; Missouri, $40; Washington University, $150; Columbia, $250; Cornell, $190; Pennsylvania, $220; Texas, $62; Wisconsin, $170–$180. Where the fees vary for the different years of the medical course they are averaged for the first two years.

three years from nine to twenty-nine students. In the Department of Pathology there will be offered during the coming year an elective course in hygiene which we hope to make attractive to a large number of students as a part of their general education.

With the exception of the summer of 1913 when a course in general physiology was offered in the Department of Physiology the Department of Anatomy is the only one in the Medical School which has offered courses during the Summer Session. These courses have been well attended. A considerable amount of scientific work has been done in all departments during the summer, and a few advanced workers have come here to take part in this work.

The course for public health officers, established in 1911–12, continues to attract a few students each year. The degree of Doctor of Public Health has been conferred on one student, now health officer at Kenosha, and another student, now district state health officer, has practically completed the requirements for this degree. There is every indication that there will be considerable public demand for well trained public health officers and that to meet this demand an increasing number of men will seek special training. Our facilities for giving this work have been increased by the recent changes in the teaching of medical bacteriology and by the changes in the State Laboratory of Hygiene. There is an increasing number of students who desire special work in the hygienic laboratory and the clinical laboratory in order to fit themselves for work either in public laboratories or for physicians.

Various members of the faculty of the Medical School have given courses for nurses at the training school at the Madison General Hospital.

III. SCIENTIFIC INVESTIGATION

There has been marked productive activity in all of the departments of the Medical School during the past two years. Without attempting to give the titles and places of publication of the various papers published, we shall here merely briefly indicate the chief fields of investigation in each department:

Anatomy: W. S. Miller, air spaces in lung of cat, trachlearis muscle, several papers on visceral anatomy, biographical sketch

of Niels Stensen; C. R. Bardeen, development of the intestines, blood supply of the intestines, the voluntary musculature, topography of the "athlete heart"; D. Townsend, development of the membranes of the brain.

Clinical Medicine: L. Shumacher and W. S. Middleton, effects of athletic sports on the heart; R. Van Valzah, a study of the physical condition of students entering the university; F. C. Rinker and S. Morris, studies on goitre; J. S. Evans, focal infection, the clinical significance of lymphocytosis; K. J. Theige, the blood picture in acute infection of the upper respiratory tract.

Pathology: C. H. Bunting and A. P. Jones, intestinal obstruction; A. P. Jones, variation in thyroid colloid; A. L. Tatum, cretinism; C. H. Bunting and J. L. Yates, Hodgkins disease.

Pharmacology and Toxicology: A. S. Loevenhart, oxidation in the animal body; A. L. Tatum, oxidation of epinephrin; A. P. Jones and A. L. Tatum, thyroid colloid; J. A. E. Eyster and A. S. Loevenhart, perfusion of isolated organs; W. H. Brown and A. S. Loevenhart, effects of hematin on the circulation; A. S. Loevenhart and A. C. Kolls, a new respiratory chamber, blood formation in atmospheres low in oxygen.

Physiology: H. C. Bradley, enzyme action, anaphylaxis, uric acid determination, autolysis of organs; J. A. E. Eyster, effects of drugs on the electro-cardiogram; J. A. E. Eyster and W. J. Meek, origin and conduction of impulse in the isolated mammalian heart, effects of epinephrin on the heart, electro-cardiogram studies, effects of morphine on the heart; H. S. Gasser, M. S. Peterson, and W. J. Meek, muscular exercise and heart acceleration; George Peirce, esterase; L. M. Warfield; ausculatory method of determining blood pressure in man; Max Morse, amino-acid content of involuting larvae, action of thyroid substance in developing larvae, involution of organs; P. M. Dawson, effect of training on the circulatory system, nerve conduction.

IV. MEDICAL CARE OF STUDENT HEALTH

When this work was organized it appealed to many chiefly from the philanthropic or charitable standpoint, the furnishing of prompt care to students, who, because of lack of means, might otherwise unduely delay seeking medical advice. While this aspect of the work has its importance, it has seemed to those in

charge from the inauguration of the work much less important than some of its other aspects. Of these the scientific, the public health, and the educational are the most vital. The centralization of the medical care of a student community of five thousand individuals offers exceptional opportunities for the scientific study of various factors on the health. The medical examination given each student when he enters the University gives data of value in the study of hygienic conditions of childhood and youth since the bad or good effects of these pre-existing conditions are to be read in the physical condition of the student at the time of entrance. The effects of various factors on the health of the student after he enters college are to be determined to no small extent by such medical examinations as may be made from time to time during his college course as he comes for medical advice or treatment. Since the factors in both cases are complicated, only long experience and careful study of a large number of cases make possible deductions of value. Studies of this kind have been undertaken and various members of the clinical staff are beginning to make preliminary reports as outlined above in the section on scientific investigation.

Upon the results of scientific study of this kind may be based wise measures taken for the betterment of the general hygienic conditions under which the students work. It is likewise likely that data of value may be obtained useful along public health lines outside the student community.

Public health measures, however, are effective in a democratic community merely in proportion to public understanding and public support. The proper education of the individual in matters of personal hygiene necessarily involves a discussion of certain aspects of public hygiene. The average individual is in the most receptive attitude concerning personal and public hygiene when he is himself sick through defects in one or the other. The education side of the work of the medical staff, therefore, becomes of great importance as to the majority of students who seek medical care.

During the year 1912–13, the clinical building, made by erecting an addition to the Olin house on Langdon Street, proved to increase markedly the facilities for the medical care of student health from each of the aspects mentioned above. During the year 1913–14, increased facilities for the care of students at the Madison General Hospital and at a small isolation cottage

on Warren Street further increased these facilities. The latter, however, proved to be too small. During the coming year the Raymer house is to be utilized and should add greatly to the effectiveness of the work. The advantage of an isolation infirmary is illustrated by the comparison of two epidemics of measles which had a similar start among the short course agricultural students. In one, which occurred four years before the opening of the infirmary, seventy-five cases of the disease developed before the epidemic was stopped; in the other, during which cases were promptly isolated, only twenty-one cases occurred.

The total number of entrance medical examinations given in 1912 was 1,623; 1,131 men and 492 women. The total number of individuals consulting during the regular college year 1912–13 was 3,397; during the summer session of 1913, 423; during the year 1913–14, 3,685; during the summer session of 1914, 449. The total number of consultations during the year 1912–13 was 23,979; during the summer session of 1913, 1,102; during the year 1913–14, 30,899; and during the summer session of 1914, 1,881. The number of students in the student wards at the Madson General Hospital, from December 1913 to July 1914, was 229; the number of students at the isolation infirmary was 34.

V. THE UNIVERSITY CLINIC

There has been considerable demand on the part of persons not students at the University for medical examinations and consultation at the University Clinic. This demand has hitherto been met in an informal way by members of the staff who have rendered such services as they could along with their other duties. As a rule, their services have been given as a matter of accommodation, and no charge has been made for them. It has seemed best both to the members of the staff and to the faculty of the Medical School that such services as are rendered by members of the staff to those not students should be more formally organized, and that those who can afford to do so should pay a fee commensurate with those charged by private consultants for similar services. On the recommendation of the Executive Committee of the Medical School the Board of Regents has accordingly established the following regulations concerning services rendered by members of the clinical staff to persons not students of the University. It is the desire of the members of the clini-

cal staff in rendering such services as they can along these lines to work in co-operation with the patient's physician.

1. *Office Hours:* The Clinical Building will be open to patients other than students on Monday, Wednesday, and Friday mornings from 10 A. M. to 12 M. from November first to August first.

2. *Referment:* Any patient thus applying for medical consultation should, whenever practicable, bring a letter from the family physician stating the purpose of the consultation and giving such data as may be of value in the case.

3. *Fees for office consultations:* Appointment cards for office consultations are to be obtained from the clerk at the University Clinic. The fees shall be paid when the appointment card is received.

4. *Outside consultations:* Members of the clinical staff may attend a patient in consultation with the patient's family physician at hours which do not conflict with regular University duties. The fees for this service shall be such as ordinarily obtain, and shall be paid at the time of the consultation.

5. *Reduction of regular fees:* When recommended by the family physician, or other competent person, and approved by a member of the medical staff, the regular fees may be reduced or waived in case of patients financially unable to pay them. No fees shall be charged patients for whose care the University is financially liable, nor for personal services rendered members of the medical profession. Indigent persons may be examined and treated free of charge.

6. *Disposition of fees:* All fees collected for the services mentioned above shall be deposited at the Bursar's office.

7. *Restrictions and exceptions:* No patients other than students shall be examined at the Clinical Building at other hours than those specified in Sec. 1, except in case of special emergency. This rule, however, shall not apply to patients for whose care the University is financially liable, nor for patients studied for purely scientific or educational purposes, or in the interest of public health or charity. The use of the laboratory shall be limited to cases under clinical study by members of the clinical staff.

VI. State Laboratory of Hygiene

(Laboratory of the State Board of Health)

The work of the State Laboratory of Hygiene has continued to expand rapidly during the past two years. The restricted quarters occupied by the laboratory have made it difficult to meet the demands made upon it. The additional laboratory space which has come from the transfer of Medical Bacteriology to Science Hall now offers welcome relief.

The number of routine examinations made during the past two years is as follows:

	July 1, 1912–July 1, 1913	July 1, 1913–July 1, 1914
Diphtheria	1,368	1,729
Typhoid	1,021	987
Sputum	2,556	3,122
Water	894	889
Sewage	.....	347
Rabies	83	55
Miscellaneous	710	1,710
Total	6,632	8,839

Number of doses of anti-typhoid vaccine sent out, 13,585.
Number of physicians and health officers who have made more or less use of the laboratory, 1,814.

VII. BUILDINGS AND EQUIPMENT

The equipment of the various departments of the Medical School has always been good and compares favorably with that in other medical schools of A+grade. In buildings we are far behind most medical schools of good grade. The departments of the Medical School have occupied either previously unused attic space or space in buildings given up by departments which have moved into new buildings. With the exception of the addition to the Olin house used by the Department of Clinical Medicine, nothing has been built with special design for use by the departments of the Medical School. In spite of this handicap, teaching and research have gone on successfully, but with the increasing classes under greater and greater difficulties. The removal of the Departments of Zoology and Botany to the new biology building from Science Hall left space in the latter building which was given in part to the Department of Geology and in part to the Departments of Anatomy and Pathology of the

Medical School. The Department of Pathology moved down from the fourth floor of South Hall to the third and fourth floors of the south wing in Science Hall. The Department of Anatomy received as additional space a large room on the fourth floor of Science Hall and the old biological laboratory on the third floor. While the facilities for teaching and research in both departments were thus extended, neither department acquired wholly satisfactory quarters for its work. The recent transfer of medical bacteriology from South Hall to Science Hall has further complicated the satisfactory use of the available space there. The Departments of Pathology and Anatomy are, however, well off as compared with those of Physiology and Pharmacology. These departments are crowded in such a way in the Chemical Engineering building as to hamper both teaching and investigation. Immediate relief is needed. The Raymer house which is being fitted up as an infirmary will, in conjunction with the student wards at the General Hospital, offer fairly adequate quarters for the care of students when ill. To utilize this house to full advantage, however, somewhat extensive alterations are needed. An addition should be built in the near future. The growth in the number of students taking courses in clinical diagnosis has so overcrowded the present clinical building that an additional story or two are needed to provide adequate quarters for this work.

The State Laboratory of Hygiene, since the removal of Medical Bacteriology to Science Hall, has expanded so as to take in the whole of the fourth story of South Hall. The rooms have been remodeled and repainted and now provide excellent quarters for the work of the laboratory.

VIII. NEEDS

The most pressing need of the Medical School, at present, is for more space for the Departments of Physiology and Pharmacology. This need is a serious one since the crowded condition of the inadequate quarters in the Chemical Engineering building not only hampers work but is unhygienic and furthermore unsafe, since the building is not fireproof.

At the last session of the legislature these needs were recognized and $200,000 was appropriated for the erection of a medical or a physics building. It was understood that if Physics were provided with a new building the space now occupied by

Physics in Science Hall could be utilized to offer relief to the Departments of Physiology and Pharmacology. The Board of Regents has decided upon the erection of a Physics building, as soon as funds are available, with the idea of transferring the Departments of Physiology and Pharmacology to Science Hall and thus, to a large extent, concentrating the teaching of the medical sciences in this building. It is therefore of great importance, not only to Physics but also to the Medical School, that the new Physics building be errected at the earliest possible time. When this building is completed and the transfer of Physiology and Pharmacology to Science Hall is made these departments will be afforded considerable relief, but the growth not only in the number of matriculated medical students but also in the number of students not matriculated in the Medical School who elect courses in the medical sciences makes it evident that it will be necessary in the very near future either to give additional room to the Medical School in Science Hall by providing for Geology elsewhere or to erect one or more buildings for the Medical School.

Next to this need for more space for Physiology and Pharmacology the most important immediate requirements of the Medical School are for an additional story or two to the present Clinical building and such remodelling of the Raymer house and additions as will make it possible to utilize it to its full capacity as a student infirmary.

In addition to these most immediate needs the time has come to consider seriously the development of the clinical part of the medical course. Medicine plays so important a part in modern civilization that it cannot be neglected with impunity by any state that aims at the highest things. Wisconsin needs a dynamic center of clinical medicine at the State University in order to maintain the progress already made in the basal sciences and to aid in further advances in the application of medical science to human needs. In the development of clinical work the aim should be to utilize to the utmost the resources of the state. While training in the elements of clinical medicine would have to be given at Madison, it would seem possible to organize a course whereby a large part of the clinical work might be obtained in institutions already existing or which might be developed in different parts of the state.

Respectfully submitted,

C. R. BARDEEN,
Dean, Medical School.

REPORT OF THE DEAN OF THE UNIVERSITY EXTENSION DIVISION

President Charles R. Van Hise,
The University of Wisconsin,

Dear Sir: I herewith submit the biennial report of University Extension for the period extending from July 1, 1912 to July 1, 1914.

POLICY

In the biennial report of University Extension covering the period from 1910–1912, it was shown that up to the end of that period, practically no departure had been made in the development of the Extension from the plans submitted to the Regents in 1908. The statement applies with equal truth to the past biennium. The growth which will be seen to have been rapid has been due to a consistent and progressive expansion of early activities, rather than to an introduction of new lines of service, that which seemed to be new having been, as a rule, merely added avenues for the application of work already under way.

Examples of vehicles for this wider application may be seen in the Community Institute and the several Bureaus, of Community Music, Health Propaganda, and Visual Instruction, described later in this report, all of recent creation. These activities, though independently serviceable, are primarily useful in opening the way wherever they go for practically every other manifestation of University Extension. Thus they are new forms, merely, and signs of normal growth implying no change of method or policy.

While it is recognized that a fixed, preconceived plan of University Extension would be harmful in tending to commit the work to a given course which in the light of changing conditions might prove disastrous to a greater or lesser degree, it is freely admitted that certain basic principles and methods are fundamental.

Among these, of primary importance is the requirement that the work shall be adaptable; that it shall inspire and lead rather than dictate; that though offering an opportunity for service from the outside, it shall cultivate in the individual or the organization the power of self-direction; that it shall increasingly justify itself in becoming the recognized instrument whereby the people shall be enabled to realize their highest possibilities both in material achievement and in social and civic betterment; and that, as the years pass, the work shall develop new methods that will reduce cost and effort and enhance efficiency.

GROWTH

A potent influence in Extension development is the growing sense of community inter-relations and the increasing number of effective organizations that are uniting neighborhoods in the interest of individual and community improvement. It is not too much to say that the time will come when University Extension should be able to reach and benefit through this machinery, either directly or indirectly, every man and woman, girl and boy, throughout the length and breadth of the state.

The rapid growth of University Extension (see tables) is due mainly to the fact that the demand for Extension service from all parts of the state has kept pace with the spread of knowledge of this service. It is an inherent element in the policy of University Extension to endeavor to create a demand where there is evident need, but as a rule no further effort is required to this end than to give definite information concerning the opportunities offered. District development and community organization are the agencies of this publicity. The situation is like that of the ball of snow rolled from the top of a hill; once started it is difficult to stop and so long as it rolls, retardation of its growth is impossible.

For the most effective service in covering the state the development of new district centers is important, but even without further districting and with no provision for expansion of the established departmental activities, the normal, unstimulated growth must inevitably be so great as to call for yearly increases of appropriation just to "mark time." If University Extension is justifiable at all, this growth must be recognized and its demands met; the response must be prompt and acceptable, or much of the value of the service be lost.

This normal increase of Extension service is little affected by the fact that it has been a settled policy of University Extension to turn over to local institutions any work it has established or aided, whenever and wherever it is possible to do so without detriment to the work. When the law was enacted creating vocational schools in all towns of 5000 or over in population, there were large numbers of working boys and girls, including apprentices, enrolled in Extension courses. As rapidly as possible these pupils were entered in the newly provided schools, Extension at the same time finding a new and important service in supplying special teachers and texts for the schools themselves. The Extension Department of Debating and Public Discussion supplies an example of a similar effort, in that it earnestly desires to place in the hands of local libraries the work of aiding debaters or speakers in their search for reference material. Every library in the state should and could do in a small way the things that are offered by this department, yet comparatively few of them are willing to give attention to this work sufficient to relieve the congestion occasioned by an overdemand that comes to University Extension. A line of this service, that relating to programs and bibliographies for the use of Women's Clubs, has been assumed by a State Department, the Travelling Library Commission, but the assistance from this source though of excellent quality is so inadequate in quantity as to afford little relief.

ORGANIZATION

The chart presented herewith shows that University Extension, consistently with its early establishment, comprises the following departments of work: Correspondence-Study, Instruction by Lectures, Debating and Public Discussion, and Welfare.

Organization of Extension Division, June 30, 1914

Madison Office

Dean

Field Staff

Department of Instruction by Lectures
- Secretary
  - Asst. Secretary
  - 1 Clerk and Stenographer
  - 1 Recording Clerk

Department of Debating & Public Discussion
- Secretary
  - 2 Assistant Librarians
  - 1 Research Librarian
  - 2 Record Clerks
  - 1 Filing Clerk
  - 1 Mailing Clerk
  - 1 Pasting Clerk
  - 1 Stenographer

Department of General Information & Welfare
- Secretary
  - Chief, Municipal Reference Bureau
    - Librarian
  - Chief, Bureau Health Instruction
    - (Headquarters Milwaukee)
  - Chief, Bureau Civic & Social Center Development
    - Clerk & Stenographer
  - Chief, Bureau Community Music
  - Community Institutes
    - Organizer
  - 1 Clerk & Stenographer
- Chief, Bureau Visual Instruction
  - 1 Assistant
  - 1 Clerk

Department of Correspondence-Study
- Secretary
  - Office Staff
    - Recorder
      - 2 Registration Clerks
      - 1 Statistical Clerk
      - 1 Clerk & Stenographer
    - 1 Clerk & Stenographer
  - Instructional Staff
    - Departments with Salaried Instructors
      - Business Administration
        - 1 Assoc. Prof.
        - 2 Instructors
        - 1 Student Assistant
        - 3 Field Instructors (1 in District No. 1, 1 in District No. 2, 1 Covering Entire State)
      - Engineering
        - Civil & Structural
          - 1 Assoc. Prof.
          - 2 Instructors
        - Electrical
          - 1 Assoc. Prof.
        - Mechanical & Industrial
          - 1 Assoc. Prof.
          - 1 Asst. Prof.
          - 3 Instructors
          - 1 Draftsman
          - 3 Student Assistants
        - Municipal & Sanitary
          - 1 Instructor
        - 7 Field Instructors – See Field Organization
      - English { 1 Assoc. Prof. & 1 Instructor (Also partly under the Asst. Prof. in charge of Latin & Greek)
      - German – 2 Instructors
      - Home Economics – 2 Instructors
      - History – 1 Assoc. Prof.
      - Latin & Greek – Asst. Prof.
      - Mathematics – 1 Asst. Prof.
      - Music – In charge of Chief, Bureau of Community Music
      - Political Economy – 1 Instructor
      - Political Science { In charge of Chief of Municipal Reference Bureau
      - Romance Languages
      - Sociology { In charge of Secretary of Dept. of General Information & Welfare
    - Departments of Instruction in charge of Members of the Faculties of the Several Colleges of the University who work for the Extension Division on the Fee Basis
      - Bacteriology, Botany, Chemistry, Drawing, Geology, Hebrew, Pharmacy, Philosophy.

Press Service
- Editor
  - Assistant

General Clerical & Administrative Staff
- Secy. & Stenographer to the Dean
- 1 Organizer
- Accountant
- Editor
- Chief Clerk
  - 1 Assistant to Chief Clerk
  - 2 Proof Readers
  - 6 Stenographers
  - 1 Dictaphone Operator
  - 4 Typists
  - 1 Stock Clerk
  - 2 Mailing Clerks
  - 2 Filing Clerks
  - 1 Multigraph Operator
  - 2 Mimeograph Operators
  - 2 Messengers
  - 2 Student-Assistants (part time)

District No. 1 Headquarters – Milwaukee
- District Representative
  - 1 Asst. Prof. Elec. Engineering
  - 1 Instructor – Mech. Engineering
  - 1 Instructor – Business Administratio
  - 2 Organizers
  - 2 Clerks & Stenographers
- Chief, Bureau of Health Instruction

District No. 2. Headquarters – Oshkosh
- District Representative
  - 1 Instructor – Engineering
  - 1 Instructor – Business Administration
  - 2 Organizers
  - 1 Clerk & Stenographer

District No. 3. Headquarters – La Crosse
- District Representative
  - 1 Instructor – Engineering
  - 1 Organizer
  - 1 Clerk & Stenographer

District No. 4 Headquarters – Superior
- District Representative
  - 1 Instructor – Engineering
  - 1 Organizer
  - 1 Clerk & Stenographer

District No. 5. Headquarters – Wausau
- District Representative
  - 1 Instructor – Engineering
  - 1 Clerk & Stenographer

District No. 6. Headquarters – Eau Claire
- District Representative
  - 1 Instructor Engineering
  - 1 Organizer
  - 1 Clerk & Stenographer

Each of these departments is in charge of a secretary who is responsible to the Dean of the Extension Division and through him to the President of the University and Board of Regents. Under the secretaries, the administration includes text writers, teachers, lecturers, assistants, and in the Department of Welfare, Chiefs of Bureaus. These officers, with the clerical force, form the central administrative body with headquarters at the University.

For the purpose of convenience in reaching every part of the state and the most favorable application of the work, local administration is provided through division of the state into districts, each with its superintendent and corps of assistants. The members of this force are similar to those at the central headquarters, with the exception of the Field Organizers, or publicity agents, who announce and explain the province of University Extension widely throughout the state.

In the Department of Correspondence-Study Instruction there are now employed 34 teachers and text writers on full time, 30 on part time, and 18 on a fee basis; in the Department of Instruction by Lectures there are 48 University men and groups who are employed occasionally, and 40 outside lecturers and entertainment companies whose services are offered through the department; in the Department of Debating and Public Discussion there are 3 assistants on full time and one on half time; and in that of Welfare, four chiefs of the following Bureaus,—Municipal Reference, started in July, 1909; Health Instruction —not new work but organized and given a special head in February, 1913; Community Music, established in July, 1913; Visual Instruction, whose chief was appointed in January, 1914; and Press Bureau created in 1913. Fifty-seven clerks and stenographers are employed in this work now. Of these, 7 are in field offices and 5 are employed temporarily.

Six districts have been organized as follows, the city which gives its name to the district being in every case the seat of its headquarters:

1. Milwaukee, organized in March, 1909.
2. Oshkosh, organized in July, 1909.
3. La Crosse, organized in August, 1911.
4. Superior, organized in July, 1912.
5. Wausau, organized in August, 1912.
6. Eau Claire, organized in November, 1913.

In reviewing the developments of the last biennium, the work of the several departments, of the Bureaus, and of the districts will be discussed briefly.

Department of Correspondence-Study

This is the largest, the most comprehensive, and the most diversely useful of the Extension departments. It comprises the part of the work that carries to individuals the opportunity for self improvement by directed study without other limitations than the student's ability and therefore appeals to a tremendous student body, one that includes members with every possible degree of preparation and widely diversified interests. The problems are sociological almost as much as educational and method is even more important in Correspondence-Study instruction than in regular school training.

Professor William H. Lighty, Secretary, presents several very complete and accurate tabulations and graphs which are prepared from records of the work of his department. (See pages at end of report).

VOCATIONS OF CORRESPONDENCE-STUDY STUDENTS

These tables include an alphabetical list of the occupations of Correspondence-Study students, 317 in number, covering a range that includes members of the learned professions at one end, and the most humble forms of service at the other. By far the larger number of these students are adults, the average age being 26 or 27 years. Their self-selected and, in some measure, self-directed studies are generally undertaken in leisure hours in response to a recognized need for further education or a desire for greater efficiency and subsequent promotion. This tabulation alone presents eloquent testimony to the widespread recognition of the need for vocational education, and is peculiarly significant in pointing out possibilities for the developments of the future.

RATE OF GROWTH

The number of registrations for Correspondence-Study from 1906 up to the date of this report is 15,990. The fact that 40 per cent of this number, 6498, were taken in the last biennium is significant of the increasing usefulness of the work, despite

the fact that some courses for which there is a demand cannot at present be offered. The number of students active during the last year of the biennium was 7,662. (See Tables II and IV). The difference between registrants and active students is due to the fact that many of those who are actively engaged in courses of study in one year may have registered in a preceding year. Thus, the number of students enrolled or registered in 1913–1914 is only 3,053, while the number of active students during the same year is 7,662.

As illustration of the unbroken growth of this work, attention is called to the following figures. The registrations in 1910–1911 were 2,350; in 1911–1912, 2,898; in 1912–1913, 3,039; and in 1913–1914, 3,459. The active students in the same years increased as follows: 4,807; 6,047; 6,315; and 7,662.

These figures show an increase of over 25 per cent in active students for the last year of the last biennium over the last year of the preceding biennium and for the same years an increase of over 15 per cent in registrations.

SMALL ENROLLMENT OF WOMEN

Of the number of students enrolled in 1913–1914 (See Table II), there are 2,478 men and 577 women. In the two years of the biennium about 17 per cent only of the total registrants were women. Under another head there is some discussion of the need for a woman field organizer who would be able to convince women throughout the state that the University has much in its Correspondence-Study service for them. Additional courses in home economics and other subjects related specially to women's interests are in process of preparation and will soon be ready for use. A large percentage of the women now enrolled are teachers who enter upon courses of study to further fit themselves for their professional work.

In 1913–1914 the students enrolled for University credit numbered 420; of the total registrants, 1,955 pursued work entirely by mail while 1,100 were instructed in local classes.

A disparity in the average ages of the students in the first and second years of the biennium, the first year's average being about 26 and that of the second nearly 27, is accounted for by a change due to the removal of the younger students who at the beginning of the second year entered the local continuation and vocational schools.

DEGREE OF PREPARATION

The preparation of correspondence students covers a wide range. Out of the total registrations for the last year there were 52 who had not attained the sixth grade in their preparation; 51 had attained the sixth grade; 513 the eighth grade; 416 are graduates from high schools; 316 had entered college; and 243 are college graduates. In the previous year the range was between 35 below sixth grade and 318 college graduates.

INSTRUCTION IN CLASSES

It is somewhat more expensive to carry on Extension teaching by class instruction than by correspondence but experience has demonstrated that for certain kinds of work it is necessary for the pupil and instructor to meet. One hundred eighty-two classes have been held during the last biennium in 49 different cities upon 49 different subjects. (See tabulation at end of report:)

COURSES COMPLETED OR DROPPED

Five thousand seven hundred and one students have completed courses since the work began in 1906; (see table); 4,404 were dropped, a total of 1,297 who completed courses over the number dropped. All those who fail to complete work for which they are enrolled must be classed as dropped although of that number a large percentage have secured from the instruction what they sought and have discontinued the work on that account. Others through change of occupation or other circumstances were prevented from completing work well begun. Therefore, not all classified under the heading "Dropped" represent failure. The proportion of the students who complete courses is larger every year.

PUBLICATION OF TEXTS

Twelve texts, written by members of the instructional force of the Extension Division, have been published in book form; eleven by the McGraw-Hill Book Company and one by D. Appleton and Company. Other texts are nearly ready for the printer.

The University has every reason for gratification in the reception of University Extension texts throughout the country. The fact that at least thirty-six educational institutions (see list at end of report), among them the Massachusetts Institute of Technology, The University of Illinois, The University of Kansas, The University of Pittsburg, and The University of Minnesota, have adopted one or more of them is evidence of their recognized value.

If all of the Correspondence-Study texts were printed the cost of clerical assistance would be greatly reduced and the routine work of the department could be accomplished more expeditiously. But the task of preparing texts is necessarily slow and while the policy of testing before printing them guarantees excellence, it further retards the publication.

TRAINING OF INDUSTRIAL TEACHERS

In the application of the laws providing for Industrial Education in Wisconsin one of the main difficulties experienced has been to secure a sufficient number of teachers having the special equipment of experience and training essential to successful industrial instruction. A training course for skilled mechanics whose tastes and abilities lead them to aspire to become teachers was begun two years ago by Professors F. D. Crawshaw, Head of the Manual Arts Department in the College of Letters and Science at the University and K. G. Smith formerly District Representative of the Milwaukee District. During this time a search has been made for a suitable person to be placed at the head of this work and Mr. Wilson H. Henderson, formerly Superintendent of Night Schools and Director of Vocational Training, of Hammond, Indiana, was recently selected for this position. He has already established favorable relations with organizations interested in this development, and the present outlook for the work is promising. Arrangements have been made to afford opportunities for practice teaching to extension students in the Milwaukee schools.

This work has been carried on fairly well for over two years, a sufficient period of time to show its possibilities, by those whose first duty was in other directions. Under a management devoted exclusively to its development there is every reason to believe that it will be successful.

TEACHING STAFF

The number of teachers who write the texts and examine correspondence-study papers or conduct classes at the University is 23 on full time, 14 on part time, and 18 on a fee basis and 11 on full time and 16 on part time at the district centers. With the passing years this splendid force of men and women has gained steadily from experience and practice until a gratifying quality has been attained in their service. The esprit de corps of the members of the teaching staff, their enthusiasm for the work, and the pleasant relations that are maintained among them contribute to the high level of achievement that is reached.

INSTRUCTION BY CORRESPONDENCE-STUDY

The departmental lines of instruction tabulated and yearly registrations in each subject recorded (See Table V), show 33 subjects that have been offered between 1906 and 1914, the number of registrants in a single subject varying from 1 to 4,415. Engineering, Business, Mathematics, Drawing, and English each show over 1,000 registrants, the largest number, 4,415, being enrolled in the several departments of engineering and the next largest, 4,392, in business courses.

Examination of the reports of teachers in charge of these lines of instruction are of interest, as showing the nature of the work and methods of instruction.

BUSINESS COURSES

Associate Professor R. S. Butler, in charge of courses in Business Administration, offers courses of instruction with the primary purpose of increasing the efficiency of special classes of business workers and further courses of a more general nature, such as those intended for preparation for the work of accountant. Examples of the more intensive courses are bookkeeping and cost finding for printers, short courses in business law, and treatment of such subjects as retail advertising and farm bookkeeping.

The intention of the instruction is to appeal to the entire business community and to provide something of practical

value for everyone who is interested in improving his business efficiency. Stress is laid, furthermore, upon the importance of improving the standard of business ethics, of broadening and emphasizing the idea of service in business activities and by this means showing the relation between good business and good citizenship.

Mr. Butler's report shows that the students are keenly appreciative of the value of this work, many reporting promotions as a result of greater efficiency gained through their studies. Also, that employers endorse the work by opening their establishments to the organizer, by aiding in the formation of classes and by advertising Extension in their paid newspaper space.

COURSES IN ENGINEERING

Associate Professor C. M. Jansky has charge of the instruction in Electrical Engineering.

A marked improvement in the students enrolled for this work is shown in the records of the past biennium, and a satisfactory interest is disclosed by the fact that many students enroll for new courses immediately upon completing the old.

Mr. Jansky has adopted methods during this period that have met with conspicuous success. For example, for the teaching of Elementary Magnetism and Electricity a course is developed experimentally, 44 simple experiments being performed by the student who thus gains immediate practical acquaintance with electric and magnetic phenomena. By questions and discussion he is helped to interpretations and applications. For these experiments the department provides 50 sets of apparatus.

Ground has been gained in the past biennium in appreciation on the part of the employer of the fact that correspondence courses in Engineering are useful not only as they increase the efficiency of the employe in his labor, but also as a means of gaining insight into his character and ways of thinking. Many corporations now encourage their employes to enroll in courses of study and some help in defraying the costs.

As an instance of co-operative activity on the part of the employer, the following proposition was made in the past year by a Milwaukee firm. "Each person desiring to enter the course

will sign an order upon the company to deduct a definite amount each month during the period covered by the course. Students leaving the service of the company shall authorize the company to deduct any amounts due the University Extension Division from their wages. At the close of the course, the company will refund a certain amount to the student, if his final standing in percentage is above 70, upon the following basis:

"To the student receiving a standing of 95 per cent to 100 per cent the company will refund the entire cost of the course of $6.00.

"For grade of

90 per cent to 95 per cent a refund of $5.00.
85 per cent to 90 per cent a refund of 4.00.
80 per cent to 85 per cent a refund of 3.00.
75 per cent to 80 per cent a refund of 2.00.
70 per cent to 75 per cent a refund of 1.00."

Twenty-five men enrolled under these conditions; fifteen of them completed the course, and the results were so satisfactory as to lead to the renewal of the proposal for other courses.

Associate Professor E. B. Norris, in charge of the Correspondence-Study instruction in Mechanical Engineering points to a decided change in the nature of his work, due to the development of the state system of industrial education. The statistics for the past biennium show a decrease of 150 students in the industrial courses and an increase of 400 students in Mechanical Engineering.

During the past two years a number of cases of increased earnings and promotions have been reported, several former students having taken important positions in the industrial world. Mr Norris makes the following comment upon some of the practical returns to be gained through courses of study in this department. "A conservative estimate", he says, "of an increase of wages of five cents an hour for just the students who have completed courses in Shop Mathematics alone would place the increase in their earnings at over $50,000 per year. In one large city of the state a campaign of instruction to the firemen in the principles of combustion has resulted in savings to the industries in fuel consumed and to the community as a

whole in the economic saving due to the reduction in smoke. In one plant the fuel saving is estimated at $2,250 a year. The mayor of the city testifies that the smoke nuisance has been greatly reduced, in fact that none of the plants which sent their employes to this class are now producing an objectionable amount of smoke.''

Associate Professor G. A. Hool is in charge of the courses in Structural Engineering.

The most successful courses taught in this department are those in ''The Elements of Structures'' and ''Reinforced Concrete Construction.'' The excellent results obtained by these courses are due in some measure to the fact that the manuscript is in printed form and that for this permanent form it has been necessary to give unusual attention to finishing them in the best possible shape.

Mr. Hool is giving a large part of his time to the preparation of texts in Civil Engineering adapted to use in Correspondence-Study instruction. The volumes issued up to the present time have met with an instant recognition and are unique in their comprehensive and detailed treatment of the subject. These texts, though published quite recently and for the purposes of our own work, have been adopted in thirty-six institutions in this and other countries.

EDUCATION AND ENGLISH

The correspondence courses in Education, prepared by members of the University instructional staff, with the exception of that in Educational Psychology, have recently been placed in charge of Mrs. E. E. Hoyt. Heretofore, this work has been given by individual instructors working on the fee basis.

The enrollments in the courses in English, in charge of Assistant Professor Arthur Beatty, have increased in number 100 per cent over those of the preceding biennium.

Among the courses given in this department during 1912–1914 are the following: Ten lectures in practical English, developed into a course; a course of seven lectures in Shakespeare, with and without University credit; a course of ten lectures on Contemporary English Literature (taken by 72 students of whom 6 received university credit); in absentia work

for the degree of Master of Arts, with courses for 1913–1914 in Carlyle, the Age of Dryden and Ruskin, and for 1914–1915 in courses in Hamlet, King Lear, and The Relations of Byron and Shelley.

The department offers seventeen courses in English of college grade. In these courses there were during the last biennium 284 active students. It also offers eleven English courses not of University grade. In these there were 211 active students.

GERMAN

Mrs. K. W. Jameson was given tentative charge of the instruction in German upon the death of Dr. E. Reinhard, which occurred during this biennium. On September 1, 1914, Miss A. B. Ernst took charge of this work.

German ranks in the second group of correspondence-study courses from the point of view of numbers enrolled. Contrary to the general opinion, it is the experience that languages are successfully taught by correspondence. Mrs. Jameson explains the devices by which the difficulties of the method are overcome.

"The arrangement of the work must be such that when the assignment has been written the student has unconsciously mastered the points intended to be taught. This can very easily be done in language work by resorting to various devices, for example, in the beginners' course the student is required to transcribe a story in phonetic characters, then to rewrite the story, answer questions based upon the story, and then rewrite the story in different tenses, etc. Any objection made to teaching German by correspondence comes from persons who have never had any experience in this line. As a general rule, students do not stop with one course, but many have taken as many as four because they claim that they receive more thorough drill and do more careful work in this manner than in residence."

HISTORY

Associate Professor W. J. Chase, who divides his time equally between the College of Letters and Science and The University Extension Division, has charge of the work in His-

tory. His report, which follows, is evidence of how thoroughly up-to-date and progressive the instruction must be made, even in Ancient History.

"Although through the comment that the instructor can make upon the student's lesson papers, much can be successfully done to keep the lesson material abreast with historical scholarship, yet periodically there accumulate reasons for a thorough revision of the course. Experience in the work reveals ways of presenting material to the student which promise more advantage to him in stimulating interest and directing effort; it becomes imperative that new reference material or new textbooks supplant or supplement the old; and new conclusions of the historian must be given their proper place in the assignment material. Such changes as these have been embodied in the revision of History 20 which carries ancient history to the time of Rome's acquisition of the Hellenic areas of the Eastern Mediterranean. A new course, History 21, has just been completed to cover the period of Roman History through both republic and empire and thus to fill the gap heretofore existing in our credit courses between Greek History and Medieval History.

For Club Study:

Oriental and Greek History.

Egyptian History, Ancient, Medieval, and Modern.

French History, a comprehensive outline designed for three years' consecutive work.

French History, Art and Literature, covering in 15 assignments the period from Louis XIV's time to the present.

Medieval History, covering in 12 assignments the principal institutional features of the period between the fall of the Roman Empire and the protestant reformation.

"Of this list the 21 assignments of Oriental and Greek History have just been finished, and an equivalent number in Roman History is planned for and begun. The course in French History, Art, and Literature has been prepared with the co-operation of Mr. Galland of the Department of Romance Languages. All of these club courses were made in response to definite calls for them from women's clubs, and it is believed that they are of such a character as to be in continual demand.

"The plans of the Department of History look to the extension of its courses for credit until all the elementary courses in history given to residence students of the University shall be offered to correspondence students. Very much, too, is yet to be done in the fields of club study work and in co-operation with the Department of Visual Instruction for the public schools of the state."

LATIN AND GREEK

In Latin and Greek Miss A. M. Pitman, Assistant Professor, reports the number of students in the past biennium as double that of the preceding biennium; also an increasing number of residence students enrolled for summer study who take this vacation work in order to accumulate credits needed to fill out their records.

The courses offered are correlated with the corresponding courses in residence and as is true of all work for credit, must satisfy the exactions of residence teachers.

Miss Pitman is successful in establishing personal relations with students enrolled in her work, not always confining her helpfulness to the subject matter of the lesson alone. "The hope is," Miss Pitman writes, "that each corrected paper will interest the student beyond the extent of the lesson and will strengthen his ambition. The fulfillment of this purpose is the chief aim of the department."

MATHEMATICS

The work of Assistant Professor H. T. Burgess, in charge of the Correspondence-Study courses in Mathematics, supplies a further illustration of the necessity for constant change and adaption even in so definite a subject as mathematics in order to keep the instruction abreast of modern methods of work and progress of applications. He reports that the fact that the residence Department of Mathematics has recently reorganized the mathematical work in the Engineering courses has made it necessary to reorganize the work of the Correspondence Department and write new courses for all credit work.

The preparatory courses also showed need of revision and several of them have been entirely rewritten. The introduc-

tion of graduate courses has been found to require but little time in their preparation and has opened a large field of usefulness for the work of the department.

During the past year this department has placed all courses for credit on the same basis as the corresponding residence courses as far as possible.

Political Economy

Political Economy, with an enrollment of nearly 700, leads the second group of Correspondence-Study courses, as ranked by numbers. In this work Mr. R. S. Trent succeeded Dr. P. H. Neystrom at the beginning of the second year of the biennium, hence Mr. Trent's report compares the work of months rather than of years of biennial periods. He finds the average number of assignments corrected per month for the year is nearly twice the number corrected during the first month of the year. It should be noted, however, that as certain months show greater activity than others in this work, Mr. Trent's computations may be exact only approximately.

In the latter part of the year evening classes in Political Economy were undertaken for the first time. In La Crosse and Madison groups were organized for the particular purpose of studying the Federal Reserve Act, which had been passed the preceding December. The work proved so successful that the department is encouraged to make greater effort to place before the busy man of business some scientific analysis of the principles upon which his activities rest.

Sociology and Political Science

Associate Professor J. L. Gillin, Secretary of the Department of Welfare, offers four Correspondence-Study courses in sociology for credit or not as elected by the student. He recommends the provision of several short courses also that would be of use to social workers.

Assistant Professor F. H. MacGregor, Chief of the Municipal Reference Bureau, offers regular courses of correspondence instruction in political science and in addition to these a guided Club Study Outline Course on Citizenship and Government, based on the volumes of the Woman Citizens' Library as texts

TABLE SHOWING THE LOCATION OF GENERAL SANITARY SURVEYS BY COUNTIES AND DISTRICTS.

County.	District.
Milwaukee	Franklin. Granville. Greenfield. Lake. Milwaukee. Oak Creek. South Milwaukee. Cudahy. West Allis. Whitefish Bay. East Milwaukee. North Milwaukee. New Butler.
Ozaukee	Cedarburg. Grafton. Mequon. Saukville. Thiensville.
Racine	Burlington. Caledonia. Dover. Mt. Pleasant. Norway. Rochester. Waterford. Corliss. Raymond. Union Grove.
Kenosha	Randall. Salem. Wheatland. Paris. Brighton.
Jefferson	Koshkonong. Jefferson.

TABLE SHOWING LOCATION AND TYPE OF SPECIAL SURVEYS FOR COMMUNICABLE DISEASES.

Location.	Disease.
Fond du Lac	Typhoid fever.
Hilbert	Scarlet fever.
Brillion	Scarlet fever.
Caledonia	Smallpox.
Racine	Smallpox.
Kenosha	Smallpox.
Ft. Atkinson	Smallpox.
Hartland	Smallpox.
Oconomowoc	Smallpox.
Lebanon	Smallpox.
Ashippun	Smallpox.
Ixonia	Smallpox.
East Troy	Smallpox.
Grafton	Smallpox.

REPORT

BY DR. L. E. SPENCER, WAUSAU, WISCONSIN, DEPUTY STATE HEALTH OFFICER, THIRD DISTRICT.

Herewith I submit my first report covering the period from October 1, 1913, to July 1, 1914, a period of nine months. This, the third sanitary district, is composed of the counties of Brown, Door, Green Lake, Kewaunee, Langlade, Lincoln, Marathon, Outagamie, Portage, Shawano, Waupaca, Waushara, Winnebago, and Wood, and has a population of 452,562, as per census of 1910. Twenty-four cities and fifty-nine villages are located in this district.

During the period covered by this report (from October 1, 1913, to July 1, 1914,) the following communicable diseases have been reported from this district by local health officers to the State Board of Health:

Diphtheria, 314 cases, with 32 deaths.
Typhoid, 61 cases, with 9 deaths.
Whooping Cough, 298 cases, with 5 deaths.
Smallpox, 406 cases, with 1 death.
Scarlet Fever, 297 cases, with 10 deaths.
Measles, 893 cases, with 3 deaths.
Tuberculosis, 109 cases, with 34 deaths.
Meningitis, 12 cases, with 7 deaths.

The number of cases reported of diphtheria, typhoid, scarlet fever, and meningitis are probably nearly correct, but in epidemics of measles, whooping cough, and smallpox the writer is of the opinion that a greater percentage of the cases are never reported. This is sometimes the fault of the health officer, but in many epidemics the larger percentage of cases are never seen by a physician and the parents do not notify the health authorities for fear of some inconvenience to which they may be subjected on account of quarantine or placarding.

The advisability of quarantine is a debatable question as regards measles and whooping cough. There is no argument as to the seriousness of these diseases and the complications which arise, but I doubt whether anything would be gained in making them quarantinable. As it is, only a percentage of the cases are reported, and the question arises, would not the parents hesitate even more than under the present regulations in calling a physician on account of fear of quarantine, if such were the ruling of the health department?

Smallpox is diagnosed and quarantine well maintained in the cities and villages, but in the country districts the disease often runs undiscovered by the local authorities for some time. In mild cases it is diagnosed by laymen, and occasionally by a physician, as Cuban itch, chicken pox, impetigo-contagiosa, etc. Smallpox in a mild form is almost continuously present in this district, and probably will be for

years to come unless we have more general vaccination, as it has been thoroughly demonstrated time and again that quarantine alone will not stamp it out.

In tuberculosis there were 109 cases reported, and 34 deaths. This high death rate probably is only apparent as no doubt many incipient cases were not reported at all,—sometimes on account of the inability of the attending physician to make a diagnosis, while other cases were not reported on account of the carelessness of the physician.

While there were 61 cases of typhoid in this district, there was no epidemic at any time, nearly all being sporadic cases. There was no outbreak from any water or milk supply, and the cases were widely scattered. Some were imported from other communities where conditions for contracting the infection were more favorable, and the remainder were probably food infections, contact and fly infections. Thirteen is the greatest number of cases reported from any one county, and in the counties of Kewaunee, Shawano, and Waupaca no cases were reported, and the writer is not aware that any cases have existed unreported in these counties. Continued education of the public as to the means of preventing typhoid will lessen this disease of filth from year to year.

In diphtheria, the 314 cases of the disease with 32 deaths in the district for a period of nine months, is an unsatisfactory showing. Earlier diagnosis, more prompt use of the State Laboratory, and the liberal use of antitoxin early in all suspected cases ought to greatly reduce the number of cases and cut the death rate materially. I have repeatedly been called to investigate outbreaks of this disease in the last year where more prompt diagnosis and the liberal use of antitoxin would have saved lives. Physicians should use the State Laboratory in all suspicious cases of sore throat, and not put their trust in clinical appearances.

The 297 cases of scarlet fever were widely scattered, there being no important epidemic of the disease. The mild type prevailing is shown by the low death rate. It is very difficult for the health authorities to stamp out this disease when a mild type prevails, as there are so many cases the physician never sees, and consequently not reported to the health department.

The question of quarantine is a very important one. It should be made as simple and inexpensive as possible for the householder; otherwise in all mild types of communicable diseases the people will try to cover up the cases, they are not reported, proper fumigation of the premises never takes place after recovery of the patient, the children return to school, and new cases arise. We must have the coöperation of the people and make quarantine as little burdensome as possible, in order to prevent the spread of communicable diseases.

Assistant-Surgeon General Trask, in Public Health Reports says: "At the present time one of the greatest handicaps to rational and

effective health administration is the lack of knowledge of public health work and of the control of disease on the part of many local health officials, and especially those of small cities, villages and rural communities. This lack of knowledge is in most instances not due to unusual ignorance but rather to the fact that there are exceedingly few men with requisite training from among whom the thousands of local health officers can be appointed."

This corresponds with my observations. Most of the health officers in the townships are laymen, and have no conception of their duties and assume no responsibility in looking out for the welfare of the community, from a public health standpoint. They are rarely paid any salary, and many of them take no interest in the work. I can recall in more than one instance where the health officer of the town was not aware of his appointment, the town officers having organized as a board of health and appointed a health officer according to law, but considered the office of so little importance that later the minutes of the meeting had to be referred to to see who was the legal health officer of the town.

Much is being accomplished with the public health conferences, in interesting and instructing these country health officers. The deputy state health officers also are now able to coöperate with, assist, and instruct these men to a considerable extent. However, the fact remains in many townships no thought is given as to ability and training for the position of local health officer. It is given to some person who is willing to accept it, and at times the office goes begging. Until such time as local communities will be willing to pay reasonable salary for a competent person to act as health officer, and demand service and can see that it pays to do so, can we hope to expect much efficiency in the administration of public health matters in rural communities, especially in the control of quarantinable diseases?

In the cities and in many of the villages of this district, the health officers (mostly physicians) are as a rule doing excellent work,—in many instances for a salary not one-half or one-third what it should be considering the work accomplished. Sometimes it is rather discouraging; for instance when the local health officer is working hard in general health work and to restrict the spread of contagious disease, and cannot get the support of the council in matters where a small expenditure of money is called for. I have in mind now one of the largest cities in this district where the city council refused the expense bill of the health officer for his trip to the biennial health conference in Madison. I believe, however, that there is a growing tendency among well-informed people to be more liberal in the support of public health activities, feeling it pays in the long run; and if this is true, no doubt more thought will be given in the future in selecting health officers and in fixing salaries commensurate with the work which is required.

There are no full time health officers in this district, but the city of Oshkosh is considering the advisability of adopting this plan.

Oshkosh has a well-equipped laboratory and does practically the same class of work as is done at the State Hygienic Laboratory. It is a great aid to the physicians of that city, as well as a valuable adjunct to the health department.

The writer has visited all the cities, some of them many times, during the last year, making general and special inspections. Have also visited nearly all of the fifty-nine villages, and many of the townships, in making sanitary surveys and special investigations.

WATER SUPPLY AND SEWERAGE SYSTEMS.

Twenty-two cities in this district have public water supplies. Two cities, Oshkosh and Sturgeon Bay, are supplied by Lake Winnebago and Sturgeon Bay, respectively. The water at Oshkosh is filtered and treated, while at Sturgeon Bay the supply is intended only for fire protection and no attempt is made to treat so as to make it fit for domestic use. Merrill is supplied from Prairie river, Appleton from Fox river, and Stevens Point from Wisconsin river. Merrill and Appleton filter and treat their supplies, while Stevens Point makes no attempt to filter, but treats with hypochlorite.

The other cities in this district have drive and dug wells for their supplies, and treatment is not considered necessary.

The importance of a safe and abundant public water supply is recognized more and more each year by the public, and many communities are agitating for the establishment of a system or for some improvement of their present one. Samples of all the public water supplies are examined frequently, and the local authorities in this territory are earnestly striving to furnish an adequate supply of good safe water. However, there are several supplies in this district which are far from being satisfactory, and while the local authorities are fully cognizant of the fact, they find it impossible (for financial reasons) to make the improvements necesssary.

There are many villages in this district large and important enough for water and sewer systems, but very few have them. The writer has in mind two villages where the installation of a sewer on the main street is the only solution of a bad drainage problem. Of course water mains should be laid at the same time. These communities recognize the need of these public improvements, but feel they cannot bear the tax burden imposed in installing same.

POLLUTION OF STREAMS.

Very little has been accomplished so far in diminishing the pollution of streams in this part of the state. Most all of the cities and many of the villages are located on important rivers, like the Wisconsin, Fox, and Wolf, and their branches; and on the shores of Lake Winnebago and Lake Michigan. Disposal plants are in operation in the inland cities, like Marshfield and Antigo, but the sewage in all the cites along the main water courses and lakes goes into

these bodies of water untreated. An immense volume of manufacturers' waste is also discharged into these public waterways, especially from the paper mills.

In cities fortunate enough to have other sources for a good water supply, this pollution of public waters is not at present a matter of great importance. However the question of stream pollution in this state is a big problem, and the beginning of its solution must be attempted in the near future.

SLAUGHTERHOUSES.

There are about 150 slaughterhouses in this district. Included in this enumeration are many places hardly worthy of the name, many of them being only small frame structures built of rough lumber and without any conveniences, where slaughtering is done during only a few months in the year, and on a very small scale, the market men in many instances purchasing most of their products from packers. Of the above, I have personally inspected seventy-five places, which included all those located contiguous to the larger cities. Twenty places were condemned, twenty-nine passed inspection under the new law regulating slaughterhouses, and in twenty-six the owners were given to understand that better buildings and equipment would have to be provided within a reasonable time.

I have tried to treat the butchers fairly in the interpretation of these new rules, and have given them to understand that the sole object is to secure the maintenance of cleanliness in the operation of these places, and that where a real effort was being made in this direction it would weigh heavily in favor of the butchers who are not equipped with all the conveniences called for in the regulations. I have personally visited practically every butcher in this district, and have delivered to him a copy of the rules and regulations of the State Board of Health, and have requested that they be read carefully. I believe a great improvement has already been made along this line. The feeding of raw offal has practically ceased since these rules were put into effect.

In the larger communities where there are several slaughterhouses in use, I have asked the butchers to consider the advisability of building one modern, well-equipped place for the joint use of all. This would be good business policy, as the individual investment would be small, and the offal (which often creates a nuisance, and is an expense to dispose of in a small establishment) might be made an asset in a plant where considerable killing would be done.

CAMP SANITATION.

The writer has been invited to speak on this subject to the members of the Northern Hemlock & Hardwood Manufacturers' Association at two of their regular meetings within the last year. The new regulations adopted by the State Board of Health governing lumber and other industrial camps were gone over and interpreted, and a free discussion followed. The State Board was assured of the

earnest coöperation of this representative body of lumbermen in carrying out the provisions of same. There are only three counties in this district (Lincoln, Langlade and Marathon,) where any logging operations of any pretensions are carried on. Many of these camps I visited over a year ago, in company with Mr. Leiserson of the Industrial Commission, and I shall endeavor to see every camp of any importance in this district during the coming winter.

I consider the general health and sanitary conditions as a whole very satisfactory in this district. However, a much better showing could be made in the future if the authorities would pay a reasonable salary to their local health officers, select the men best fitted for the position, demand good service in return, and keep good men in office as long as their work is satifactory.

The larger cities, I should say those of 10,000 population and over, should encourage the establishment of laboratories in connection with the health department. The local health officer, if he is interested in his work, is willing in most instances to spend the time and money to learn the technique for the more ordinary work (if he is not already familiar with same), providing the city will furnish the equipment and bear the nominal expense of the laboratory.

The State Laboratory is doing more and more of this work each year, but there are physicians in every community who would take advantage of a local laboratory much more often than where it is necessary to send in specimens and wait for a reply by mail.

REPORT

BY DR. FRED JOHNSON, EAU CLAIRE, WISCONSIN, DEPUTY STATE HEALTH OFFICER, FOURTH DISTRICT.

This report covers the period from November 1, 1913, to July 1, 1914. District No. 4 includes the following counties: LaCrosse, Monroe, Jackson, Trempealeau, Buffalo, Pepin, Eau Claire, Clark, Chippewa, Dunn, Pierce, St. Croix, Polk, Barron, Rusk, Sawyer, Washburn and Burnett.

The southern half of the district is well settled country and has different health problems to solve than the northern half which is only sparsely inhabited. There is a higher death rate in the southern counties owing, no doubt, to the fact that there is a larger urban population.

The only infectious disease which seems to be well reported is typhoid fever. The eruptive, communicable diseases have appeared in such mild form that they have frequently not been under medical observation and so have escaped the notice of the local authorities.

In the southern counties there is a larger proportion of deaths occuring in people over sixty-five years, which can be accounted for by the fact that the younger people have settled in the northern districts, leaving the old people to remain at home in the neighborhoods to which they came one or two generations ago.

The rate of mortality in Barron county is somewhat higher than in 1912 and there is also a slight falling off in the birth rate. The large number of cases of diphtheria is due to medical carelessness or ignorance, several deaths having occured before the disease was recognized. Tuberculosis is well reported in the county.

There is a slight decrease in the death rate in Buffalo county. There were very few cases of infectious disease and no epidemics during the past year.

Burnett county has a high death rate which can be accounted for by the fact that the western part of the county has been settled for forty years and a large proportion of the deaths were in people over sixty years of age. The doctors are careless in reporting tuberculosis. A number of cases of typhoid fever were due to infection by a carrier.

Chippewa county has rather a high mortality rate—11.9, which, however, is about the same as in 1912. Forty-eight deaths among children under one year indicates that instruction in the care and feeding of infants ought to bear fruit. Thirty-five deaths from tuberculosis seems a rather high rate. Scarlet fever was prevalent but the mortality rate was low.

The general death rate in Clark county is lower than the average. The infant mortality was high and there were as many deaths from pneumonia as from tuberculosis.

Dunn county has a low mortality rate. Pneumonia led in the list of causes of death in this county. Scarlet fever and smallpox were quite prevalent in the rural districts, but they were in mild form and the tendency to conceal the fact so that they would not be bothered with quarantine was evident.

Eau Claire county has a comparatively high death rate of over 11 per thousand. The infant mortality was high, fifty-four in nine months and forty-two deaths from pneumonia. Tuberculosis is on the decline and there were very few cases of the eruptive, communicable diseases.

Jackson county has a mortality rate of 10 and a birth rate of 19.3. Cancer follows tuberculosis very closely as a cause of death. The only prevalent, contagious disease in the northern towns last winter was smallpox.

La Crosse county has a high mortality rate of 12.9 and a birth rate of 20.9. The infant mortality rate is high. The health department of the city of La Crosse, although efficient, meets with considerable opposition in trying to improve the milk supply. There was one epidemic of diphtheria during the year, but it was well managed by the local health authorities.

In Monroe county, pneumonia, tuberculosis and cancer head the list in the order named. In one city in the county diphtheria has been present in a mild form for about one year. The local authorities do not think it of sufficient importance to have the school children examined. Smallpox has been prevalent in the rural districts and is rather hard to control.

Pepin county has a mortality rate of 11 and a birth rate of 20. Scarlet fever and measles were prevalent during the spring months.

Pierce county has a mortality rate of 10 and a birth rate of 17. The infant mortality rate is low. Although smallpox and scarlet fever prevailed to some extent, no deaths were reported.

Polk county has a death rate of 9.2 and a birth rate of 25. As usual, pneumonia, cancer and tuberculosis lead as causes of mortality. Sporadic cases of smallpox and scarlet fever were reported.

In Rusk county the birth rate was 27, the highest in the district. The infant mortality was rather high, but this is due, I believe, to the high birth rate.

St. Croix county has a low birth rate of 19 with an average infant mortality. Pneumonia and tuberculosis cause the most deaths. Scarlet fever and measles were quite prevalent but unreported, owing to the disease appearing in a mild form.

Sawyer county has a death rate of 10 and a birth rate of 18.4. In this county it is hard to get statistics from the Indians, where tuberculosis is very prevalent. Many of them live off the reservations and in most unhygienic surroundings. There were few cases of communicable disease.

Trempealeau county has a mortality rate of 10 and a birth rate of 23 per thousand. Pneumonia and tuberculosis lead the list as usual. The diphtheria cases were all in the southern part of the county, and were a part of the same epidemic which prevailed in La Crosse. The smallpox epidemic was in the northern part of the county and it was controlled with some difficulty. No deaths from smallpox were reported.

Washburn county has a low mortality rate but a high birth rate. The infant mortality is rather high, and pneumonia and tuberculosis lead in the causes of death. One death from diphtheria occurred in this county.

I have made in all eighty-five sanitary surveys and have visited nearly all the cities and villages of over 500 population. I find that the sanitary conditions in the small villages are not so good as in the larger towns. There are, in my opinion, more children with physical defects in the small places than in the better governed cities, where there is medical inspection of school children.

The local boards of health are, as a rule, well organized and do more work than they get compensation for. Where a city of 4,000 people pays its health officer $125 per year, they cannot expect much in return. If the local health officer is a physician, he does not get compensation enough to make it worth while to neglect his prac-

tice. We must impress on the people that if they want the public health looked after properly, they must give adequate compensation for the work done. In the cities which have a commission form of government there is usually a better health administration. This is due to the fact that usually a member of the commission acts as health officer.

The newest city in my district is not only the cleanest, but they are making intelligent and foresighted plans to keep the sanitary conditions of the city up to a high standard. The health officer is efficient and quarantine regulations are strictly enforced. The only infectious disease in the town is tuberculosis.

In contrast with this, I will refer to an old river town of 10,000 population. They have a few private sewers running into the river, but most of the population is served by overflowing privy vaults. The public school buildings are all old insanitary fire traps, the citizens believing that what was good enough for them will do for their children.

I found ideal conditions in a village only two years old. They have a good sewer system with water works, and there is much interest in health matters.

In contrast to this, I found an old village in a well-settled region where business is so flourishing that they can support two large banks. The streets are unpaved, the alleys are full of manure piles and garbage is thrown anywhere. The schools are overcrowded and, judging from the appearance of many of the inhabitants, personal cleanliness is not generally practiced. Typhoid fever is quite common and the communicable diseases are spread more easily every year.

Where the people are cleanly and wide-awake in sanitary matters there is much less in the way of infectious disease and the health officer finds little to criticize. Some health officers in the county seem to be guided wholly by the sense of smell, and if they have no public nuisance in their district, they flatter themselves that everything is as it should be.

I have made seventeen inspections on account of outbreaks of communicable diseases. I found the most trouble with scarlet fever when it appeared in a very mild form. A careful inspection would always reveal the fact that some cases were attending school and the only remedy for this condition is to have a daily inspection of the schools by a competent medical man. In the country district, cases are not reported because quarantine means a cutting off of the revenue of the dairyman who furnishes the supply of milk. In one neighborhood, by dint of persuasion, letters and threats, I succeeded in stamping out the epidemic. This condition, however, is typical of many farming communities.

I had an interesting and valuable experience in one county with a typhoid carrier. In a community in the northern part of the state typhoid fever prevailed for four years and a number of water ex-

aminations had been made with negative results. On inquiry, I found that these families in which typhoid had occurred had visited a certain farmhouse where the head of the family had suffered from typhoid five years ago. He had been sick away from home and after his recovery and return to his family others in the home had contracted the disease. Then those in the neighborhood developed the same ailment until twenty-two cases had been reported. Examination of his excreta showed typhoid bacilli in his urine. He was forbidden to milk, handle milk, or any milk utensils, and his discharges were all disinfected. Since then no new cases have developed in that neighborhood.

I observed another epidemic of typhoid fever the result of contact infection where there were fifteen cases and one death.

The eruptive, communicable diseases are a great source of public danger where the members of the medical profession, either through ignorance, carelessness or for other reasons fail to make known or report their diagnosis. Quite a large number of medical men refuse to make a diagnosis of an infectious disease where it will cause trouble, inconvenience or financial loss to their clients. I have insisted in the differential diagnosis between varicella and smallpox that the absence of prodroma is the crucial test for chickenpox. In severe cases of communicable disease there is usually not much difficulty in enforcing quarantine, but in mild cases it is quite another thing, as the people cannot see why they should be quarantined when they were not sick.

I have made seventeen special investigations on complaints of nuisances. One of the popular complaints in small villages is the condition of the stockyards. I have ordered cement floors in most cases with instructions for frequent flushings, which generally abates the nuisance complained of. I have investigated a hundred slaughterhouses and only found two that were fit places to prepare food for human consumption. The worst one that I found was eight miles from the corporate limits of a town and when not used as a slaughterhouse, served as a roost for chickens. The floor was originally of boards, but there was so much dirt on it that you could not find it without digging. The pigpen joined the slaughterhouse where a great deal of meat was prepared for sale. In such cases, I have insisted on cement floors, screen doors and windows, the sanitary disposal of offal, and a general cleaning up of the interior of the slaughterhouse. In the larger places I have encouraged the butchers to get together and have a central abattoir built, preferably a municipal one. In one city arrangements are being made for a central abattoir to take the place of seven unsanitary places. Those who protest the loudest against the expense of making sanitary improvements are generally the ones to rebuild first.

As to vital statistics, I found in my general survey that the health officials are not to blame for imperfect reports. The doctors are usually the delinquents in this respect; they sometimes delay their

reports until the end of the month and then forget to fill them out and mail them to the local registrars. I have notified a number of them, but I think that a few convictions and fines will be much more effective in some cases. Nearly all of the cities and villages obtain their water supply from wells. There are few exceptions. One city of 5,000 gets its supply from a small lake and another of 5,000 uses river water. There are some that use well water for ordinary purposes but have connection with the river in case of fire.

On the subject of proper sewage disposal, although somewhat careless, we are in advance of most other states according to a recent report. The largest city in this district without a public sewer is one with 1,900 inhabitants. I have found only seven towns of over 1,000 population without a public sewer system and in three of these, owing to the character of the soil, it would be a very expensive proposition. In villages of from 500 to 1,000 population there are nine that have a public sewer and several others are planning to make this improvement as soon as their finances will permit. Nearly all of the cities and villages use, without purification, the natural waterways for their sewage disposal. This should not be permitted. In a town of 1,900 inhabitants, which has no public sewage disposal, there are a number of small private sewers at all levels emptying into a small river which cannot take care of more sewage so that this town must have a septic tank and filtration plant in the near future.

In contrast to the above there is a village only two years old that has installed a public sewer and made preparation for all future needs.

Another place which grew from 75 to 3,000 population in fourteen years has had a great deal of trouble and extra expense because they did not plan for the future and soon outgrew the sewer system.

The rivers in this district are, no doubt, to some extent becoming polluted by the discharges of sewage, but, as the water is not used for drinking purposes, there is no complaint so far about pollution.

I have given several informal talks to medical societies on more efficient reporting of contagious diseases including tuberculosis, but the worst offenders do not attend medical meetings, so I make it a point to call on every doctor in the town where I make my survey and by personal contact try to impress on them what their duty is in this respect. I have prepared three papers for different medical societies, when I had a subject that I wanted to present, and was only received with discourtesy in one instance. The greatest trouble, I believe, with the reporting of tuberculosis is that these cases wander about from one doctor to another and the last man thinks that the other fellow has reported it. Some men are so depraved as to conceal from the patient or his friends that he has tuberculosis so that they can continue treating the patient.

Another hindrance in the collection of cases of dangerous, com-

municable disease is the frequent changing of health officers. A doctor who is treating a case in an adjoining town often does not know the name or post-office address of the new health officer and so the case is unreported. A few convictions, however, for not reporting would convince the doctors that they had better comply with the law.

The value and need of deputy state health officers is illustrated by the case of the typhoid carrier which I have alluded to; at the laboratory they were suspicious of a carrier from the history of the spread of the infection in one neighborhood. If a field man had been appointed a year before, he might have prevented the spread of the infection that much sooner and thus have prevented much unnecessary illness and several deaths.

The rural communities have not received the consideration that their importance demands. A complete survey of every county should be made so as to obtain positive data on local health conditions; then the local authorities will be willing to listen to our suggestions and carry them into effect. By this survey, I mean a canvass of every home and business place, get the medical history of every family and examine every suspicious case for tuberculosis. This work should be done with the assistance of the local health officer in each district. The visiting nurses can be of great help in a survey of this kind and their assistance should be obtained in all cases. The work that has been done is superficial, but it has been of great value in stimulating interest in health problems throughout the state.

REPORT

BY DR. W. C. BENNETT, RHINELANDER, WIS., DEPUTY STATE HEALTH OFFICER, FIFTH DISTRICT.

This district comprises the counties of Ashland, Bayfield, Douglas, Florence, Forest, Iron, Marinette, Oconto, Oneida, Price, Taylor and Vilas.

The number of inspections covers a period of eight months, from Nov. 1st, 1913, to June 30th, 1914.

The character of work done is indicated, as follows:

General inspections	24	Hotels	2
Creameries	3	Tuberculosis	5
Stock yards	1	Diphtheria	1
Pickle factory	1	Schools	2
Smallpox	8	Ice	1
Vital statistics	2	Typhoid	3
Rabies	2		
Water supplies	24	Total	127
Sewers	19		
Lumber camps	6	Number towns visited	48
Dumping grounds	4	Number visits	69
Trichinosis	1	Number hospitals visited	52
Slaughterhouses	18	Number municipal units inspected	66

During the year 48 towns were visited, some of them a number of times. Except in cases where haste was necessary, a general survey of the health conditions, existing at the time, was made. Inasmuch as the district was entirely new and many conditions existing in this part of the state totally unfamiliar, the work was at first not carried on with the facility which later became possible. There are a number of conditions not observed in the north, which need to be carefully watched in the southern part of the state, and the converse is also true. The almost total absence of intestinal diseases, even in the large cities, is a thing that requires time to appreciate. There is apparently a much lessened tendency toward decomposition of organic matter, than exists in the south. This is evident in the absence of nuisances under conditions which would inevitably produce them further south. On the other hand, the lumber camps are ideal places as they are often conducted, for the breeding of such diseases as typhoid fever and smallpox, and the difficulty of visiting the camps, makes a widespread epidemic very difficult to manage.

Some camps are connected with each other by obscure trails in a way that is readily conducive to the spreading of communicable diseases, and prevents to a great extent the tracing of the paths of travel of the disease. When this cannot be done, the work of suppressing an epidemic is tremendously complicated and uncertain.

The local boards of health have invariably done all that they could to assist us in lessening disease where epidemics actually existed, but there is a strong tendency toward a false economy in the matter of warding off future trouble. This is seen in the small and often ridiculous appropriations made for health work in the cities, and the meager stipend paid to health officers everywhere. It is a matter deserving of great praise that the men engaged in this work will do so much work, often of a very disagreeable nature, and with almost no compensation except the curses or threats of their fellow townsmen, whom they are trying to aid. It is true that many health officers do not exert themselves particularly, except in the face of an epidemic, but when the obvious necessity arises, they are found ready to do their duty to the utmost.

Some health officers scorn the salary and do most efficient work merely for the good of the cause. One, in particular, has fought several epidemics, importuned local authorities to secure sanitary schools, public buildings, clean streets, alleys and yards, inspected depots, factories and, in short, every place that might require looking after, to bring his town up to a maximum of healthfulness. Two years of gruelling work of this sort has had the effect of showing thinking people the value of the efforts made, and though many growlers are yet in evidence, they are becoming perceptibly less and words of appreciation are becoming correspondingly more frequent. It is to be hoped that the authorities will recognize the worth of his labors in a more substantial manner.

In general, however, it may be said that active health work, will not be done, unless the remuneration is more nearly proportionate to the effort expended.

In the townships containing no villages, there are many health officers who hold the position from year to year without doing a single thing in the way of health work. As no salary is paid, it is considered to be a very satisfactory arrangement. With so much to be done, it seems a pity that all this time is wasted, and if the health officers were educated even to a slight extent along the lines of public health work a great deal might be done to improve the insanitary conditions which are prevalent.

In the eight months covered by the report, twenty inspections were made on account of outbreaks of communicable diseases.

The matter of public dumping grounds is deserving of some mention. Villages and small cities are peculiarly careless about the location and care of dumping grounds. Very often they are almost in the heart of the town, it evidently being considered that convenience in reaching the grounds is the primary object in locating them. Then, again, the materials dumped are not sufficiently regulated. Decomposing organic matter is frequently thrown on the dump and allowed to lie uncovered and unmolested. People living in the vicinity become righteously indignant but are often laughed at by the local authorities for complaining.

One of two things must be done in these cases. Either the dumping grounds must be removed to a remote spot, where there are no dwellings near, or the local authorities must conduct the dump in such a way that it will not annoy those living in the neighborhood. Frequent burning of combustible material or burying of such material as will not burn is imperative.

The northern district is not very abundantly supplied with slaughterhouses and frequently a few suggestions in the way of making repairs is sufficient to drive those already established out of business. Owners seem to prefer to import meats rather than to go to any expense in providing sanitary abbatoirs. At most slaughterhouses the feeding of offal just outside of the building is practiced and instructions are given to comply with the law. It is also demanded that slaughterhouses be kept properly clean, that screens be provided, and uncontaminated water used. Also that the ground surrounding the building be kept in proper condition.

Two physicians were prosecuted for failing to report births according to law. It is expected that physicians will report these properly, although it is sometimes an inconvenience to do so. Very often the inheritance of property is determined by the presence or absence of a birth certificate, and while the fee provided may be very small for the amount of trouble involved in securing the data in some cases, in general it is liberal enough, and physicians and others owe it to society to do this work. That there are other important reasons for securing the reports, adds to the weight of the argument.

The water supply of towns has been investigated particularly, because of the great importance attaching to a pure water for domestic purposes. Most places, both large and small, have good water supplies, but there are a few which do not. One large city pours its untreated sewage into its water supply and to this the wastes of several manufacturing plants are added. To counteract this, hypochlorite is used but the disagreeable taste produced by the combination is so marked that the inhabitants must frequently go without water or purchase spring water. Such a condition, from a sanitary standpoint, is inexcusable.

Another town secures its water from a sluggish stream, and at times, it is so loaded with algae, particularly uroglena, that the water is almost undrinkable. This water, naturally, is especially susceptible to inoculation with typhoid and other pathogenic organisms, and as a matter of fact, a small epidemic of typhoid was induced by it last winter. At this place the intake has been extended a short distance and the current is a little more rapid at its present location, but the change is only one of degree.

The subject of the reporting of tuberculosis has always been considered when conversing with local health officers. It does not seem to be so much a desire to shirk the duty, as a failure to understand just what is wanted that prevents a more general compliance with this law. If the Board would prepare a pamphlet, giving in detail what was wanted and how to go about it, there would undoubtedly be a much greater coöperation among the physicians. For the others, probably at the present time, not much can be expected.

One hears stories of typhoid epidemics and other epidemics involving hundreds of victims, but there are none of these now, and this must be attributed to the enforcement of known sanitary laws in recent years. In a way, it is a high tribute to sanitary science that people will not stand for conditions now that a few years ago they accepted without question.

The general health of the district has been reasonably good during the year, but it is hoped that the deaths of children under five years of age will be materially decreased in the present year. With almost no deaths from diarrhoeal diseases, the showing ought to be much better.

Being strongly of the belief that preventable physical defects in children are the cause of many deaths annually, either directly or indirectly, of school children; that they are the cause of most of the retardation occurring in the schools; that they are the cause of most of the early suspension of school work; that depending to a large extent on the latter fact, they are the cause of a vast amount of the expense consequent on the operation of governments, courts, charitable and penal institutions, it was deemed advisable to make a start toward correcting some of these defects as they existed in the rural schools.

To this end a blank was prepared and instructions as to how to

make simple tests for common defects, for use by the teachers. While not a great deal was expected of them, it was felt that whatever was accomplished would be a clear gain and that it would be a step in the direction of getting more efficient work done in the future. The result, however, was a very agreeable surprise, for the examinations were found to be much more complete and valuable than had been expected. It is established that the rural teachers can readily secure a knowledge of the gross defects of the children under her care. And if sufficient interest can be aroused, she will make recommendations for further examinations and treatment, which will be of vast benefit to the individual pupils and through them, to society.

That much interest was felt in the work by the teachers was evidenced by the fact that over one-tenth of the children examined were so recommended. A few of the results obtained may not prove uninteresting. 1,041 children were examined, 83 were designated "sickly," 301 had defective vision, 304 were troubled more or less with headaches, 33 had discharging ears, while 203 had defective hearing in one or both ears. One half had decayed teeth, 248 had nasal obstruction and 178 were mouth breathers. 158 were said to be nervous, and 119 were classed as "dull" or "stupid." A number of other interesting conditions were discovered, but the above will suffice to indicate what was done.

In addition to the discovery of gross physical defects and the subsequent reference of these cases to medical men, an effort is being made to encourage individual study of each pupil by the teacher, with the idea of adapting the work of the child to its peculiar needs and abilities. It has long been realized that the adapting of the child to the course of study is based on a wrong principle, but as yet no decided departure from this irrational method has been made. It is hoped that this work will cause an appreciation of the value of individual child study that will hasten the change in methods of teaching which is so sadly needed.

It is certain that a realization of the intimate connection between physical abnormality and mental inefficiency and even of moral obliquity, will result in beneficial changes sooner or later.

While it is not expected or desired that this method of school inspection shall take the place of inspections by medical men, where such a method is possible, it is believed that there are advantages in this method, in some respects, over the other. For instance, no school inspector can observe the child at its work and at play and under the various conditions that a teacher has, and there are many mental, moral and even physical properties brought out under these conditions that might escape the observation of the medical inspector entirely. It would seem that a combination of the two methods might be almost ideal. At any rate, in the absence of a regular inspector, this method has a great deal in its favor, and so far as observed, no drawbacks.

The following tables show in detail the results of the investigations made in the rural schools of Oneida county:

CONDITION OF SCHOOLS AND GROUNDS—ONEIDA COUNTY.

Number of schools having less than 200 cubic feet air space per pupil	3
Number of schools having approximately 200 cubic feet air space per pupil	3
Number of schools with deficient or badly arranged light	22
Number of schools not stated	4
Number of schools with closets not screened	9
Number of schools without pure water	14
Number of schools without sanitary tanks	3
Number of schools without proper ventilation	15
Number of schools heated with common stoves (not jacketed)	17

APPARENT RELATION BETWEEN DECAYED TEETH AND CERTAIN MORBID CONDITIONS.

	Number	Per cent
Total cases earache	*134	.....
With decayed teeth	99	73
Without decayed teeth	35	27
Total "tender nostrils"	138	.....
With decayed teeth	84	60
Without decayed teeth	54	40
Total "mouth breathers"	180	.....
With decayed teeth	124	60
Without decayed teeth	56	40
Total "goiter"	56	.....
With decayed teeth	36	64
Without decayed teeth	20	36

* Some cases classed as earache are likely toothache.

TABLE SHOWING CONDITION OF PUPILS IN ONEIDA COUNTY RURAL SCHOOLS.

	Number	Per cent
Total children reported	1,041	.....
Males	533	51.2
Females	508	48.8
Total under 8 years of age	224	21.5
Males	124	55.3
Females	100	44.7
Total 8 to 11 years, inclusive	457	43.9
Males	231	50.5
Females	226	49.5
Total 12 to 15 years, inclusice	312	30.0
Males	155	49.8
Females	157	50.2
Total 16 years and over	48	4.6
Males	23	47.9
Females	25	52.1
Total designated "sickly"	83	7.9
Males	40	.....
Females	43	.....
Total with abnormal skin (pale, yellow, etc.)	91	8.7
Males	41	.....
Females	50	.....

TABLE SHOWING CONDITION OF PUPILS IN ONEIDA COUNTY RURAL SCHOOLS—Continued.

	Number	Per cent
Total with eyes "inflamed, dull, swollen"	61	5.8
Males	36	.....
Females	25	.....
Total "eyes pain or smart"	174	16.7
Males	87	.....
Females	87	.....
Total "defective vision" one eye only	130	12.5
Males	65	.....
Females	65	.....
Total "defective vision" both eyes	171	16.4
Males	73	42.6
Females	98	57.4
Total "defective vision"	301	28.9
(This would be materially increased if 18 teachers reported properly.)		
Total "headache"	304	29.2
Males	132	.....
Females	172	.....
Total "other eye trouble" (gran. lids, etc.)	51	4.9
Males	28	.....
Females	23	.....
Total ears "discharge"	33	3.2
Males	20	.....
Females	13	.....
Total ears "ache"	143	13.7
Males	72	.....
Females	78	.....
Total "defective hearing" one ear	159	15.3
Males	81	.....
Females	78	.....
Total "defective hearing" both ears	44	4.2
Males	25	.....
Females	19	.....
Total "tonsils palpable"	188	18.0
Males	98	.....
Females	90	.....
Total "tonsils tender"	153	14.7
Males	77	.....
Females	76	.....
Total "teeth decayed"	508	50.0
Males	249	.....
Females	259	.....
Total "teeth ache"	306	30.0
Males	144	.....
Females	162	.....
Total "nasal obstruction" right	87	8.3
Males	42	.....
Females	45	.....
Total "nasal obstruction" left	93	9.0
Males	43	.....
Females	50	.....
Total "nasal obstruction" both nostrils	68	.....
(15 of these may have been acute.)		
Total "voice indicating obstruction"	61	5.8
Males	30	.....
Females	31	.....

TABLE SHOWING CONDITION OF PUPILS IN ONEIDA COUNTY RURAL SCHOOLS—Continued.

	Number	Per cent
Total "mouth breathers"	178	17.1
Males	86	.....
Females	92	.....
Total "goiter"	57	5.5
Males	13	.....
Females	44	.....
Total "easily out of breath"	141	13.5
Males	61	.....
Females	80	.....
Total "chronic cough"	11	1.0
Males	4	.....
Females	7	.....
Total "afternoon fever"	38	3.6
Males	11	.....
Females	27	.....
Total "often sick"	87	8.3
Males	41	.....
Females	46	.....
Total "apparent deformity;" sickness or peculiarity	32	3.2
Males	17	.....
Females	15	.....
Total "nervous"	158	15.1
Males	78	.....
Females	80	.....
Total "imbecile"	2	.2
Males	2	.....
Females	0	.....
Total "stupid	7	.7
Males	4	.....
Females	3	.....
Total "dull"	110	10.5
Males	69	.....
Females	41	.....
Total "normal"	461	44.3
Males	241	.....
Females	220	.....
Total "bright"	315	30.3
Males	142	.....
Females	173	.....
Total "very bright"	91	8.7
Males	44	.....
Females	47	.....
Total	.....	94.9
Not rated	.....	5.1
	.....	100.00
Total "using tobacco"	85	8.0
Total "referred by teachers"	105	10.0
Males	41	.....
Females	64	.....
Total "should be referred"	567	54.4
Males	286	.....
Females	281	.....

possession ahead of the publication of the Wisconsin Blue Book.

An added feature of the service by which the papers are read, their contents analyzed, and matters they have secured from the University recorded, enables the Press Bureau to know

1. The periodicals that use University material.
2. How regularly used.
3. Periodicals not using University material.
4. The kind of article that is popular.
5. What news of the University is touching the people.

No story or article is allowed to go into the mails until it has been thoroughly checked and approved by the department of the University from which it originated.

In time it is hoped to make the instruction by the University of the people through the press the strongest and most important work of the Bureau. By utilizing the Bureau as a clearing house, every department in the University is offered the opportunity to influence and stimulate thousands of readers. It is quite consistent with the broad and liberal view of University service characteristic of Wisconsin, that some part of the lessons taught to the resident student shall be conveyed in more or less popular form to the great newspaper reading public. This would seem one possible means of greatly improving the quality of general reading matter that fills a large part of the daily and weekly news space.

In addition to the news gathered directly by the editorial staff and such assistance as has been gained from the instructional force, the Bureau has sought and secured co-operation from the head of the course in Journalism who last year assigned between forty and fifty students to cover this work. Each student was given a county and a list of the students who registered from that county. This resulted in a news service that was acceptable to the papers published in the counties from which the students mentioned in the news items came.

As an evidence of the success of Mr. Holman's policy, in the nine months between December 6, 1913, and August 1, 1914, the following new stories appeared as a result of this service: On Extension, 2725; Agricultural, 2417; with respect

to administration, 458; on athletics, 120; Historical, 88; Editorial, 77; from the College of Letters and Science, 73; Engineering, 41; Medical, 36; Musical, 36; Law, 2; and of miscellaneous interest, 368; making a total of 6,441 articles, many of them purely educational. Many of these articles have appeared in papers all over America, and one has been secured for publication in a federal bulletin.

Districts

Although mention was made in the Biennial Report of 1910–1912 of the prospective opening of the Districts of Superior and Wausau, they were not established until early in the following year, the Superior District in July, 1912, and the Wausau District in August of the same year.

On November 1, 1913, the Eau Claire District was opened.

There are now six districts with central offices in each district. These six districts cover 66.2 per cent of the total area of the state. Including the counties worked from the home office—those lying near Madison—the area of the state covered is about 77 per cent. The southwestern corner has no provision for local service and other parts of the state are inadequately covered.

It has been planned to open two more districts during this biennium, but the imperative demand for additional assistance to carry on the established work and the desire to keep the expenses of the biennium as low as possible may make it inadvisable to do so. However, the distribution of Extension students throughout the state shows that district organization is important. As soon as practicable, therefore, two, or better, three additional districts to cover the remainder of the state should be opened.

Milwaukee District

Mr. E. M. Barrows, present District Representative of the Milwaukee District, was appointed less than a year ago. Previous to that time, Professor K. G. Smith was in charge. During Mr. Smith's regimen the work of the district was almost entirely elementary industrial. After the law relating to industrial education went into effect, a large part of this work

was gradually assumed by the Continuation Schools. As has been explained, this was done with the hearty co-operation of the Extension Division. The change, however, cut heavily upon the Extension registrations and required a reorganization in that district. The same thing happened in other districts, but not to the same extent, no other district having met in its early development so definite a call for training applied to industries. What has happened in the Milwaukee District is an excellent illustration of the need for adaptability in Extension methods.

Mr. Barrows thoroughly appreciates the situation, has reorganized the work, and is handling the problem in a way that should guarantee large results. His report shows how a district must be studied and the work adapted to conditions.

HEADQUARTERS

The existing headquarters having proved too small to accommodate the growing staff of instructors and organizers, and the class space insufficient, suitable headquarters were found in the old Milwaukee Academy Building, 471 Van Buren Street. This building has been leased for five years and remodeled to suit the needs of the Extension Division and the Wisconsin Anti-Tuberculosis Association jointly. The building was ready for occupancy late in February, and by the first of March all offices and departments were completely settled there. A proportion of the rental is paid by the Anti-Tuberculosis Association.

REVIEW OF WORK OF FIRST AND SECOND YEARS

The year 1912–1913 was devoted almost exclusively to class work in business and engineering subjects. The Extension Division had an extensive system of classes in elementary shop mathematics, and elementary drawing for shop apprentices in various factories throughout this district. These constituted the bulk of the Engineering work. A number of classes in elementary business subjects, principally in Bookkeeping and Elementary Cost Accounting were held in Milwaukee and Racine. These courses made up some 60 per cent of the total registration for the year. The apprentice work amounted to approxi-

mately 26 per cent, leaving 14 per cent of the registration for advanced Engineering, Business, and general subjects. A social service institute, designed to give technical instruction in problems of dependency to social workers, was held at the public library building in Milwaukee. A class in contemporary English Literature was held at the public library also. These, with an English class at Fort Atkinson, constituted most of the general work done in 1912–1913.

With the adoption of the continuation school system in the summer of 1913, by the leading cities in this district, the apprentice work was abandoned, and thus it was possible to place more emphasis on the higher engineering subjects and upon work of a general character. The proportion of class work to correspondence work changed from 97 per cent of the total registration in 1911–1913 to approximately 54 per cent in 1913–1914. In all, 17 classes, or study groups, were held in 1913–1914 as against 32 in 1912–1913. These included 7 engineering courses, 6 business courses, 1 course in Spanish, 1 course in public speaking, 1 course in English literature, and 1 medical course. The broadening tendency of the work in this district is revealed in these figures. In 1913–1914, the number of higher Engineering course registrations more than quadrupled, while the number of elementary course registrations diminished by somewhat the same proportion. In shop drawing and elementary Mathematics registrations are more stable, although the distribution of students in these two courses almost reverses itself in the two years. Registrations in English increased in 1913–1914 from 46 to 96, an increase of over 100 per cent. No registrations were taken in modern languages in 1912–1913 as against 23 in 1913–1914.

The total class registrations amount to approximately 50 per cent of the total registrations, although the number of subjects in which courses were given was less than 33 per cent of the total number of subjects in which registrations were taken. The work in 1912–1913 consists almost exclusively of class work, while the class work in 1913–1914 consists of only a trifle over half of the total, and there is an increasing variety in the work selected.

THE REPRESENTATIVE'S FORECAST OF THE COMING YEAR'S WORK

It is not possible to forecast accurately the amount of work which can be done in one year in the rather plastic present state of our organization. The plans here outlined indicate only the trend of the coming year's work; circumstances may necessitate changes.

General Plan of the Work. While the correspondence and class work will be pushed vigorously, the Lecture Department, Community Institutes, and Social Centers will this year be given a proportionate share of attention. Local conditions make it necessary that the class work in the city of Milwaukee receive the first attention. During the early winter the attempt will be made to establish Extension work on a basis which will permit of its continuance through the year in all towns in which community institutes have been held, and in certain other selected towns. The lecture work will be pushed during this time also.

In this outline, only the main features of the work are indicated. A single social center experiment on a rather elaborate scale in the city of Kenosha, some continuation school work, a series of city lecture courses, some special work through conventions and such organizations, are also an inherent part of this year's program, which must be carried through continuously while our general program is being consistently pursued. A training course in social service, based on the six weeks' experiment along this line by the Wisconsin Anti-Tuberculosis Association, is under consideration also, but it is not definite enough yet to warrant any forecast.

A class in school ventilation to be conducted in Racine is a unique attempt to solve the problem of heating and ventilating for janitors. The Racine board of education agrees to register all its janitors in the six or eight assignment course on school heating and ventilation, which course is based upon a preliminary survey of the Racine schools themselves. If successful, it is planned to place the same course in other larger cities in this district.

Based on demands from special groups, the following lecture series are under consideration for Milwaukee. These

lectures are instructional, and students will be registered in the courses as in correspondence and class work.

1. A course of six lectures for University Club of Milwaukee. It has been suggested by club members that we try to get the services of a distinguished scholar in a special field, as for example an Egyptologist, for this lecture series.

2. A commercial course, probably on money and banking, or the tariff, for the Merchants & Manufacturers' Association of Milwaukee.

3. A course in Industrialism and the Labor Movement, worked out in such a manner as to be interpretative and of interest to both organized industries and organized labor.

4. A series of lectures probably dealing with the economic status of woman, arranged for the Woman's Clubs, and allied organizations of Milwaukee.

5. A course dealing with the federal currency act, given for the bank clerks' institute and the banking interests in Milwaukee.

Four towns have indicated a degree of interest in the community institute idea.

The social center problem in this district is in many ways complex. Milwaukee has an excellent system of social centers with which the Extension Division is on the most cordial relations. In most of the smaller towns of the district, there is much interest in the possibilities of the social center. This interest is easily aroused to the point of a public meeting, but once the meeting is held, if there is no definite plan of action started, interest dies down again, and it becomes exceedingly hard to re-awaken. Yet the social center should furnish an ideal basis for Extension work if the Extension Division could identify itself with the inception of the movement in a community, and thus attain a strategic position for placing its courses, classes, correspondence work, and lectures. For this purpose we are very fortunate in having as District Organizer, Mr. Clinton S. Childs, former executive secretary of the New York City Social Center Committee who brings into this work a fund of practical experience in the details of social center management exceeded by few men in the United States.

Through the influence of Mrs. Bradford, superintendent of schools at Kenosha, one of the ward schools of Kenosha will

be placed at our disposal with janitor service, light, and heat furnished, this winter for a trial under very favorable conditions of the experiment of making the Social Center the basis for the application of Extension services. Mrs. Bradford who is deeply interested, promises to use her influence in the organization of a local social center committee to take general charge of the work. The plan is to have a local executive committee to supervise all social and educational activities in the building, in the evening, with Mr. Childs acting in an advisory capacity, and the University Extension Division supplying lecture courses, classes, facilities, for debating and dramatic clubs, etc., and supplying with the aid of local committees a series of meetings on civic subjects.

In connection with the foregoing more fully enumerated activities, the year's plans will include for the people's benefit, the extensive use of the work of the Health Instruction Bureau, the Municipal Reference Bureau, the Municipal and Sanitary Engineering Service, the Package Library, the Debating and Public Discussion, Visual Instruction, and allied departments.

Oshkosh District

Mr. A. H. Melville, District Representative and teacher of Sociology in the second district, reports the development of Extension work in the three years since he assumed the duties of his office. In 1911–1912, this district made 501 registrations; in 1912–1913, 565; and in 1913–1914, 748, thus showing an unbroken and satisfactory growth.

During the year of 1913–1914, a considerable increase in the total number of students took place, especially among those who were pursuing Correspondence-Study courses. The number of Correspondence-Study students during the year was 256 as compared with 99 for the previous year. Correspondence-Study registrations were 34.1 per cent of class registrations as compared with 17.1 per cent for 1912–1913. The number of class students was 493 as compared with 466 for the previous year. Twenty-nine classes were organized in 1913–1914 in 12 towns with an average enrollment of 17 students to a class, about the same average attendance as for the previous year.

In this district as in the first the establishment of the continuation schools made a change in the nature of a large part of the work called for during the biennium, the representative points especially to the rapid increase in the number of registrations for business subjects. The registrations in these courses constitute nearly half of the total number of registrations in the district. He notes that though the students are busy people having business engagements, social obligations, changes of schedules, lay-offs, and other obstacles which sometimes interfere seriously with study and occasionally compel them to drop their courses, yet the percentage of those who actually complete work in this district is large, ranging as it does from 50 to 70 per cent of the total registrations depending on kind of employment, et cetera.

In February, 1912, an eight-day child welfare exhibit and institute was held in Oshkosh under the auspices of the Extension Division co-operating with various civic and social bodies of the town. A great deal of interest was manifested in the meetings. The attendance was good—about 4,000 people were present at the different meetings. A great deal of enthusiasm was shown and the words of commendation from teachers, city officials, and public spirited persons indicate the values of the institute to the city.

With the opening of the year 1912–1913, the placing of lecture and entertainment courses was transferred to the districts. It may be observed that this work started out very briskly and that it has made a rapid growth. With about a dozen lecture courses in the Fox River Valley in 1911–1912 and 17 courses in 1912–1913, the number grew to 62 courses in 1913–1914. During the present year, 54 courses have been booked to date and probably before the end of the season the number will be equal to that for the previous year. In building up this large patronage only such attractions as are wholesome and educational in nature and that have real worth for a community have been urged. The courses range in price from $50 to $530; and the size of community from inland country hamlets of 25 or 30 people to cities of 35,000. The 62 courses placed consisted of 71 lectures, 82 entertainments, and 50 musical attractions. The amount of money saved to communities by buying University courses is large. In many

cases this saving has meant the difference between the town having a lecture course and not having any course at all. Our records show that 11 or more towns were enabled to finance good wholesome attractions of an educational nature this year that did not have lecture courses until the University made it possible for them to afford them.

La Crosse District

Mr. W. P. Roseman has held the position of District Representative of the La Crosse District since its establishment.

The present biennial registration added to that of the previous period gives this district a total registration of 899. This registration represents 796 different individuals; and that the work has been a success during the entire period is indicated by the fact that 103 registered for more than one course.

About 40 per cent of the enrollment is in engineering subjects, and 34 per cent in business subjects; or, a total of 74 per cent are enrolled for what may be called vocational or practical subjects. The balance, or 26 per cent, have enrolled for preparatory and college subjects.

The spirit injected into the work of this district may be seen in the following from the representative:

It is difficult to enumerate the various ways in which we have assisted these young people, but I am thoroughly convinced that their lives have been enriched in a number of directions. We tried to inspire them by pointing out the possibilities for the young men and women who become most proficient in the particular line of work in which they are engaged. We have encouraged them to make use of the public library, to read current books along lines most closely connected with their work. We have contrasted the type of man who wastes time and energy in alluring pleasures with the more vigorous type who is ambitious and is willing to spend at least one evening a week to add something to his own efficiency and thereby increase his happiness as well as his earning power. In our classes we tried to do more than to teach the subject matter. The instructors aimed to encourage the men in their work and make them feel that service should be placed higher than wages. All this, in addition to the instruc-

tion and encouragement received direct from the instructors in Madison with whom the students are brought into correspondence, has no doubt brought many of these 900 young people into a new and more wholesome environment.

All departments of Extension service have been brought to the people of the district and cordial co-operation is experienced from civic, social, and business organizations, women's clubs, school boards, and people in general.

Superior District

Mr. J. P. O'Connor, holds the office of District Representative for the Superior or Fourth District.

When the office of this district was opened at Superior in August, 1912, it was found that the activities of Wisconsin Extension were little known in northern Wisconsin. Forty students had registered for Correspondence-Study previous to that time, but the general public had little knowledge of the work. Publicity work, in which the newspapers gave valuable aid, was carried forward as rapidly as possible, and response was secured at once. Since July 15th, 1912 the total number of registrations for home-study work is 781, represented by 747 different individuals, of whom 607 are men and 144 women. Of these students, 422 have pursued business courses, 135 have taken engineering or mechanical subjects, 108 studied language, 61 took work in mathematics, 23 studied in the sciences, and 26 may be classed as students in cultural subjects. The majority of the students desire work in vocational subjects. About six per cent of the total number apply for work involving University credit.

Nearly all of the students of this district express a desire for class work, and it is consequently necessary to have a greater number of teachers than can be employed for the local work, alone. On account of the distance from Madison and the consequent time and expense involved in using the regular faculty instructors, it has been necessary to rely upon the district force and residents of this part of the state, and excellent local teachers in commercial law, pharmacy, French, German, English, social problems, and salesmanship have been secured.

The matter of organizing classes for elementary work in English has been given considerable attention. This work, in many localities, is well handled by the industrial night schools but in the rural communities and the smaller cities which have no industrial night schools, the work of teaching English to non-English speaking people should be actively carried forward by some agency, and the Extension Division can do much to initiate and further this work. Three classes for non-English speaking students have been conducted this year, and the results indicate the possibilities of the work. Such students are usually unable to carry the correspondence work, but they attend regularly and are very appreciative of the class work.

In opening the work of the lecture department it was found that only four towns in this district had secured the University Extension service. This work has been built up gradually and during the last twelve months fifty-three numbers have been given in thirteen different communities. Present demands indicate that the service will be increased about thirty per cent during the next year.

Wausau District

On August 1, 1914, Mr. F. R. Hamilton who has been District Representative of the Wausau District since its organization, resigned to take the position of Director of Extension at The University of Kansas. Mr. Hamilton did excellent work. It is unfortunate that Wisconsin must lose him, but the opportunities offered by The University of Kansas to do constructive work in a broader field left no choice but to wish him well in his new undertaking.

The Fifth District for University Extension work was opened in Wausau, August, 1912. Three suitable rooms were secured, half of the expense being borne by the local Board of Education. The force in the office has consisted regularly of a District Representative, Engineering Instructor, Field Organizer, and Stenographer. This force has been augmented from time to time as the work demanded, by additional instructors, both from the University and the city of Wausau. The growth of the work will be indicated by the following brief statements, covering the activities in the different departments.

In Correspondence-Study there have been

Registrations—701	
Business	357
Engineering	246
Miscellaneous	98
	701
Classes—31	

A large percentage of the students registered for engineering and business courses have been members of one or more of the classes offered in those subjects. The engineering instructor has conducted classes in plumbing, telephony, shop mathematics, gas engines, college algebra, mechanical drawing, and lumber measurements. The business classes organized were retail selling, accounting, money and banking, bookkeeping, window trimming, law of sales, and business English.

The boards of education and common council have very willingly permitted the use of class rooms. In addition to the classes, correspondence students have been registered in 57 different communities.

"It is well," says Mr. Hamilton, "at this time to consider a demand for certain courses which the district has been unable to meet, viz:—courses in agriculture and courses in law. From the number of inquiries which have been made during the past two years it is evident that if courses were prepared in these two departments there would be a heavy enrollment for the work."

In addition to furnishing lectures for teachers' meetings and commencements, there have been arranged in this district 98 popular and educational lecture courses. The sizes of the communities having these courses vary from the largest city in the district, Wausau, population 17,000, to the rural communities, such as Plover, R. F. D. The result of the experiment of placing a course in a rural community greatly exceeded the expectations. The patronage which it received indicates that the rural communities offer a fertile field for lecture course activities.

During the spring of 1914 the matter of arranging lecture courses in such places was taken up with the county superintendents, and received their hearty approval. One county

superintendent wrote,—"This idea has never been tried in this community but I am convinced that it has great possibilities and that it will be a means for community growth in many ways." As a result, several courses have been arranged for inland and rural communities. It is hard for one not acquainted with the field to properly appreciate the value which such work has in the small and more isolated communities of the state.

Eau Claire District

Mr. J. H. Ames, who was elected District Representative of the Sixth District in the fall of 1913, was formerly Vice President of the River Falls State Normal School. His acquaintance in that district and his natural fitness for Extension work made him an especially effective worker. It is with great regret that his resignation has been received. The inducements from the Normal School with which he was formerly connected are so great that we cannot retain him.

That Mr. Ames began at once to secure results may be seen from his summaries of the work of his district from November 20, 1913, to July 1, 1914. The totals only are included:

Total of students enrolled in 11 courses of study	240
Number of towns represented	15
Total of classes	12
Total of members of classes	195
Individual students receiving instruction from field instructor	12
Lecture courses	32
Single lectures	17
Schools and clubs supplied with debating material and package libraries	14

Many other miscellaneous activities in furtherance of social center development, arrangements for community institutes, business men's meetings, etc., etc.

Resignations

During the past biennium one Secretary, two District Representatives, twenty-one Instructors, and seven Field Organizers have resigned. There are several reasons for this large number of resignations:

First, offers of more remunerative positions. At least thirteen left for this reason. A number of these went to Extension work in other states, the experience gained in Wisconsin making them desirable workers elsewhere.

Second, requests to resign. Since the Extension Division was organized, at least thirteen workers have been asked to resign because of lack of certain qualifications. Two others working for a definite period who desired to be reengaged were not, for the same reason. One man who had been engaged for six weeks with the understanding that if he made good he would be given a permanent place was not retained. Four others who were with the Extension Division for a year or more gave excellent service in many ways but fell short in certain particulars. Two of these received offers to go to other positions at my recommendation. The other two were called to other positions but could have been retained had we desired to keep them. Our experience has made it evident that strong, capable, effective teachers in residence may prove ineffective in Correspondence-Study instruction.

Third, many of the resignations were due to the fact that the employes themselves realized that they were not effective extension workers.

We should have been glad to retain some of the men who left us, but the opportunities offered them, including compensation, were large, and similar inducements could not be held out to keep them in their old positions.

The large number of changes during the past year, consequent upon these resignations, might seem to imply that discontent prevails among the teachers. The opposite is true. The members of the force are appreciative and loyal, but the Extension Division has a congenial atmosphere only for those who are thoroughly interested and who are securing at least satisfactory results.

HOUSING

In 1910, an estimate was presented of the space needed for efficient work of the Extension Division at the administration headquarters in the University. The legislature of 1911 made an appropriation for housing the Extension Division. The

work was then housed in University Hall, scattered from the basement to the attic, occupying, in many cases, inconvenient waste spaces, and using many inconvenient corners for storing its material.

On May 18, 1914, the work was moved to the new quarters, a building used jointly by the Extension Division and the Department of Home Economics, so completely divided, however, as to make practically two buildings.

The rooms and offices in the new quarters are admirably adapted to the work, but already the space is inadequate. The growth of the Division has been so rapid that the estimates of space made nearly five years ago, which then seemed generous, now prove to be insufficient for certain departments. Offices which were planned for two individuals must now house four. It has been necessary to line with shelves the walls of the lower halls for files of lesson papers, and certain basement rooms in University Hall have had to be retained for storage of working material of the Department of Debating and Public Discussion.

Nevertheless, the working facilities are in many respects admirable. They are so superior to the conditions that prevailed in University Hall that the only reason for calling attention to the situation is to make known the fact that it will be soon necessary to provide additional space if the Extension Division continues to grow.

Milwaukee Headquarters

The old quarters in Milwaukee, on the third floor of a business building, consisted of one general organizer's office, a District Representative's office, a general class room and Instructor's office, and an engineering drafting room. The new quarters include a separate room for stenographers, separate offices, adequate though not large, for the District Representatives and for the group of organizers, a lobby or reception room which can also be used as a class or meeting room, offices for the business and engineering instructors, a large room capable of seating 175 people or more, divided by a sliding partition into two class rooms, and an engineering class room. The building is steam heated and electric lighted. Besides

the space which is devoted to the district offices of the Extension Division, the Health Bureau of the Extension Division and the Wisconsin Anti-Tuberculosis Association occupy three offices and a large basement for the exhibits of the Health Bureau. The auditorium is available for lectures and small public meetings of various kinds. Plans for next year's work include the use of this building for several lecture courses and public meetings of a nature which would have been utterly impossible in one of the commercial buildings such as the Extension Division has occupied heretofore.

DEVELOPMENT CALLED-FOR

As has been pointed out, the addition of two or three district centers is needed in order to spread the work evenly over the entire area of the state. Attention has been called also to several urgent demands not met in the present applications of established work. These demands call for added courses of study and added workers with special qualifications, of such a nature as to recommend themselves upon examination. The following are among the most important of these and should be met as soon as funds are available.

(a) Agricultural correspondence courses:

There is a growing demand for short unit correspondence courses in agriculture. Provision should be made for giving such courses at a very low rate. It is the practice of the College of Agriculture to do extension work free of cost. In order, therefore, to make the agricultural correspondence courses acceptable, they must be offered on a different fee basis from that which now prevails in the Extension Division. With the co-operation of the Agricultural College this work could be made widely useful not only for farmers but also for persons in towns and cities who desire to prepare for agricultural employment.

(b) Definite provision for commercial research and reference:

The last biennial extension report presented a program of work for a Commercial Research and Reference Bureau. The establishment of such a Bureau

during the next biennium is greatly to be desired. A man in charge and one clerk only would need to be added to the force. Beyond this overhead charge, the work could and should be made self-supporting.

(c) Additional provision for applications to women's special interests:

A woman organizer would be of wide use in the field. The person selected for this work should be trained in home economics as well as literature and should be well versed in woman's club management. Her duties should include the registration of correspondence students in all subjects, assistance in the establishment of women's organizations, and service to established clubs in the making and carrying out of their program of work and pleasure.

(d) Extended service in community and city promotion:

The Extension Division force needs a man thoroughly trained and experienced in matters relating to city promotion, preferably one who has been executive secretary of a commercial club or similar organization in a city of considerable size. The work of such a man should consist in awakening communities to the importance of better civic conditions, showing them the value of organization, and the need for study of all questions that have to do with municipal and community improvement. Such a worker having shown the value of organization and education, should be able, if desired, to help in the organization of communities, bringing to their attention the services offered by University Extension in the solution of community problems Assistance of this nature is in demand throughout the state. People have begun to recognize the need for education in municipal management, but do not know how to secure it. The addition of such a member to our Welfare Department would increase the usefulness of the Municipal Reference Bureau, and, in fact, of all the established bureaus as well as of the community institutes. The position might be described as that of special advance agent for community work.

Little less important than the foregoing called-for developments is the need for expansion in certain educational lines as for instance in the languages, especially Spanish, for which there is a growing demand. There is opportunity, also, for useful co-operation between University Extension and the Civil Service Commission, whereby aspirants to Civil Service positions would be enabled to secure through Correspondence-Study courses, work adapted especially to their requirements.

Much more might be accomplished through the departmental and district organizations with added clerical and instructional force.

Loan Libraries

The development of Correspondence-Study instruction has come to the point where a general policy with reference to supplying library and laboratory facilities to students living in isolated communities must be established and permanent equipment acquired. In this work the Free Library Commission has generally assisted but no outside institution can be expected to meet the demands for books which are useful only for narrowly specialized Extension work.

Revolving Appropriation

In accordance with the act of the last legislature requiring that all fees collected for service rendered by the University force be paid to the State Treasurer, over $30,000 was turned back to the State by the Extension Division. This practice of returning the fees to the State Treasurer has limited the service which the Extension Division might have given during the past year.

For example, we have had many calls from vocational school boards for aid in the development of their schools by supplying instructors to meet classes once a week, the school board in these cases paying the full cost of the service received. If the fees received for this work could be put into a revolving appropriation and used to pay our teachers, the amount of this service might be materially increased. Since the vocational schools need these special teachers for only once or twice a week, they cannot afford, of course, to engage a man for his whole time and frequently it is impossible to find any one in the community who

has the training required for the work. By securing the use of our itinerant teachers they are enabled to carry on their classes in the best possible manner at a minimum cost.

The same thing applies to several other kinds of work which we are doing. It would seem, therefore, in order to make the Extension Division as helpful as possible that the policy of the revolving appropriation such as is now adopted in our outside lecture work should be extended to other definite service. The method has worked satisfactorily for the lecture work, its value being fully demonstrated. We believe that this fact will be recognized by the legislature.

Normal Increases

SALARIES

The members of the teaching force of the Extension Division are in the main young men and women. Three-fourths of them are between twenty-five and thirty-five years of age. Practically none have reached the limit of salary in the positions which they hold. It is evident that in order to retain them they must be advanced until they reach what is recognized as a fair salary for the responsibilities of their positions. This means, consequently, that annual increases relatively large must be made in salaries of instructors. The fact that 31 resignations took place during the past biennium, many for reason of outside offers of increased salary, is a proof of this statement.

The salaries paid to the clerks and stenographers in the Extension Division have been lower, on the average, than those paid in any other department of the state.

OCCASIONAL INSTRUCTION

It has been the practice to provide an item in the budget to meet the payment of teachers for temporary service during the vacation time of the regular teachers or during times when work is too heavy for the regular force, also for local teachers throughout the state who are paid for services rendered on the basis of a certain price per class. The need for occasional classes is growing so rapidly that the item for additional instruction must be increased for next year. This work could be taken care of

by enlarging the teaching staff in the district offices, but this would be much more expensive and is not necessary except for specialized subjects.

YEARLY GROWTH

To meet the demands of the regular yearly growth in all departments additional members of both instructional and clerical force will be needed during the coming year. Similarly, increased expenditure will be necessary for printing, postage, traveling, freight, express, and general supplies.

POLICY OF DEVELOPMENT

At the present moment, a policy of conservative development for the Extension Division would seem to be advisable. To meet the needs merely of normal growth will require an additional appropriation of not less than $25,000. To satisfy the demand for new districts and special developments a considerably larger increase would be required. Provision for these should no doubt be made and would be urged did not the increase necessary for growth under established conditions seem so large. The reason for so large an increase is readily appreciated when figures such as the following are taken into account: In the Correspondence-study Department alone the increase in registrations of this year for August was 46 per cent, for September 21 per cent, and for October 14 per cent over those of the corresponding months last year. This growth, at least, should be provided for. With a smaller appropriation than that estimated it would be impossible fully to meet not only the obligations of this department but of any department.

It is doubtless true, that improvement can be made in University Extension, but I believe it is conceded by those who examine the work that the expenditure made for it, is justified many times over by the results secured.

THE FUTURE OF EXTENSION

Under its present organization, the University Extension Division is an organic part of the state system of education and is closely affiliated with several of the state departments. The future, if one may judge from past experience, should increase

ingly show the wisdom of this provision. The establishment of University agents in every part of the state, their activity in service to individuals, to the smaller communities, and to municipalities already has been fruitful of better understanding of the truth that the State University is not in reality the possession of a limited few. I believe that we may expect that the coming years will prove, as has never been realized before, that the University and the government are a common possession in a very practical and serviceable sense. As criticism frequently is the outcome of lack of understanding, this widely extended service should lead in the course of a decade to the complete breaking down of the prejudice and indifference existing at present among those who have hitherto had no opportunity for personal contact with or benefit from the invaluable resources of the people's University.

Respectfully submitted,

LOUIS E. REBER,

Dean.

TABLE II

Occupations of Correspondence-Study Students

A

Abstractor, accountant, adjustor, advertising agent, advertisement writer, agricultural extension agent, agriculturist, appraiser, apprentice, architectural designer, architectural draftsman, artist, art glass salesman, assembler, assessor of income, assistant engineer, assistant observer, assistant postmaster, assistant superintendent, attorney at law, auditor.

B

Bacteriologist, bank clerk, banker, bank teller, baker, barber, berry grower, blacksmith, building superintendent, blue printer, boiler maker, boiler washer, bond salesman, bookkeeper, box factory, brakeman, brewer, business, butcher, button cutter, button maker.

C

Cabinet maker, caddie master, candy merchant, canner, canvassing, carpenter, cashier, cashier of bank, chauffeur, chairman, cheese dealer, chemist, chief clerk, chief mail clerk, chief of employment bureau, china painting, chiropractor, cigar maker, city salesman, civil engineer, clergyman, clerk, clothier, coalman, cobbler, collection manager, common laborer, composer, compositor, concrete foreman, conductor, construction foreman, contractor, converter man, correspondence, cost accountant, cost clerk, cost of efficiency, county surveyor, creamery, credit man, custom inspector.

D

Dairying, dean of women, delivery man, dentist, detailer, director of education, director of manual arts, domestic, draftsman, dressmaker, driver, drug apprentice, drug clerk, druggist, dyer.

E

Editor, electrician, electrotypist, emergency man, engineer, engine tester, erecting engineer, estimator, examiner Federal Government, express messenger, experimental engineer.

F

Factory hand, farmer, farm hand, field organizer, fig maintainer, filler, fireman, florist and seed grower, foreman, foreman tester, forester assistant, foundry checker, foundry foreman, fur designer, furniture house.

G

Garage man, garage owner, gardener, general agent, general superintendent, geologist, government employe, grain dealer, granite cutter, grinder, grocer.

H

Hardware merchant, harness maker, health commissioner, hospital corps, hospital externe, hotel clerk, housekeeper, house wife, hydro electric engineer.

I

Inspector, installer, instructor, insurance agent, iron moulder, iron worker.

J

Janitor, jewelry, journalist.

L

Landlord of hotel, landscape gardener, lathe foreman, laundry, leather chemist, letter carrier, librarian, lineman, lithographer, liveryman, locomotive engineer, lumber agent, lumberman, lumber scaler, lunch room man.

M

Machinist, maid, manufacturer, mason, masseur, matron, meat cutter, mechanical draftsman, member of legislature, meter man, meteorologist, manufacturing agent, manager shoe store, mill hand, mining engineer, minister, motor assembler, motorman, moulder, municipal engineer, musician, music teacher.

N

Naval officer, newspaper reporter, nurse.

O

Office boy, office girl, office man, office manager, oil driver, operating engineer, order clerk, osteopathic doctor.

P

Painting, paperhanger, pattern maker, pharmacist, photographer, physical training, director, physician, piano salesman, piano teacher, planing mill, plantation manager, plasterer, playground instructor, plumber, postal clerk, president academy, press man, principal, printer, private secretary, probation officer, production manager, product superintendent, proof reader, proprietor of foundry, publisher, purchasing agent.

R

Railroad signaler, railroad station agent, real estate broker, real estate solicitor, recovering teller, register of deeds, registrar, registrar in Probate Court, repair man, restaurant owner, retail clerk, rivet heater, road inspector, rodman.

S

Sailor navy, saleslady, salesman, saloonkeeper, sanitary engineer, saw setter, science assistant (U. S. Dept. Ag.) secretary, secretary of aluminum plant, secretary associated charities, secretary of auto company, secretary of board of education, secretary of Y. M. C. A., settlement worker, sheriff, shipping clerk, shoe clerk, social center director, social welfare, solicitor, soldier, specification clerk, stair builder, statistician, statistical clerk, stationary engineer, steam fitter, steward hotel, stenographer, stockman, stockroom foreman, student, structural designer, superintendent of aluminum plant, superintendent of bridge work, superintendent of city water works, superintendent of electrical plant, superintendent of school, superintendent of construction work, surgeon, surveyor.

T

Tailor, teacher, teacher manual training, teamster, telegraph operator, telephone man, tester, timekeeper, tinner, tool maker, tonnage clerk, tracer, traffic manager, transfer company, transitman, traveling man, treasurer manufacturing company.

U

Undertaker, underwriter, U. S. forestry, U. S. navy medical department.

V

Voltage regulator.

W

Waiter, watchman, weatherman, weaver, weigh master, wife and mother, window trimmer, wireman, woodworker, wrapping papers.

The above list shows 317 occupations reported by 5,786 students comprising the roster of this biennial period. Some of the students failed to fill out this form.

TABLE III

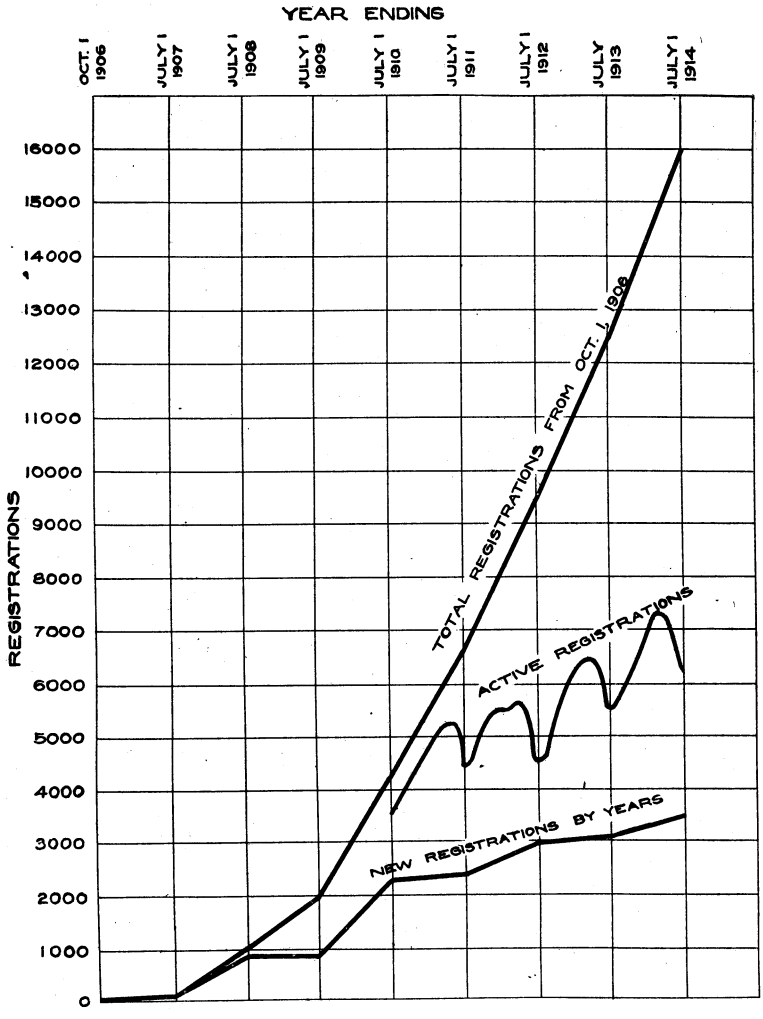
Correspondence-Study Registrations

	1912–13	1913–14
Number of students active in biennium	6313	7662
Number of students enrolled during biennium	2731	3053
Number of courses enrolled for during biennium	3039	3459
Number of men enrolled during biennium	2249	2478
Number of women enrolled during biennium	482	577
Number of students enrolled for University credit during biennium	360	420
Number of students enrolled not for University credit during biennium	2371	2635
Number of students instructed in local classes during the biennium	1373	1100
Number of students pursuing work entirely by mail during biennium	1358	1955
The average age of students enrolled during the biennium	26.07	26.7

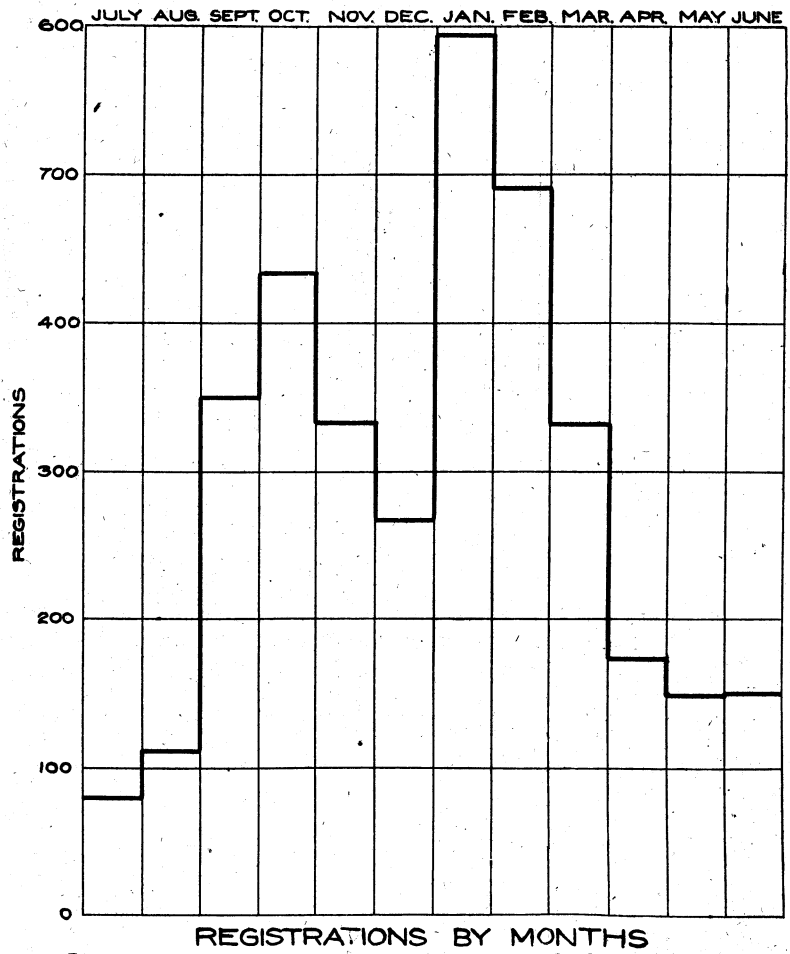
TABLE IV

Correspondence-Study Student Preparation

	1912–13	1913–14
Number of students below the sixth grade	35	52
Number of students attained the sixth grade	42	51
Number of students attained the seventh grade	112	99
Number of students attained the eighth grade	441	513
Number of students attained high school	331	442
Number of students graduated from high school	311	416
Number of students attained business college	145	158
Number of students attained or graduated from normal school	102	169
Number of students attained college	282	316
Number of students graduated from college	318	243
Number of students giving no data	612	596



GROWTH OF THE CORRESPONDENCE-STUDY WORK



Showing, for the year July 1, 1913 to June 30, 1914, how the correspondence-study registrations vary with favorable and less favorable seasons for study

TABLE V

Analysis of Correspondence-Study Registrations

The table which follows gives in detail information regarding registrations in Correspondence-Study courses since the inauguration of the work in 1906 to July 1, 1914, the end of the present biennial period.

	Total registrations to July 1, 1914	Registrations before July 1, 1912	Registrations for biennium 1912–1914	Registrations for 2nd year biennium 1913–1914	Registrations completed before July 1, 1912	Registrations completed during biennium, 1912–1914	Registrations completed, 1913–1914	Total registrations completed to July 1, 1914	Registrations for credit, completed to July 1, 1914	Changes by transfer	Registrations dropped	Registrations holding over July 1, 1914
Ancient Languages	151	103	48	21	35	22	12	57	44	—9	35	50
Astronomy	14	11	3	1	5	5	2	10	.....	.....	1	3
Bacteriology	64	42	22	10	7	9	9	16	10	—1	18	29
(Medical) Lectures	313	86	227	36	86	227	36	313	.....	.....	.....	.....
Botany	62	33	29	17	7	12	9	19	17	—12	6	25
Business	4,392	2,120	2,272	1,252	895	1,108	653	2,003	3	—11	992	1,386
Chemistry	104	61	43	29	9	31	18	40	3	—6	27	31
Drawing	1,295	898	397	150	167	149	58	316	26	—17	482	480
Education	156	86	70	50	32	53	42	85	70	—2	22	47
Engineering (Electrical)	621	380	241	145	42	76	45	118	.....	—7	135	361
Engineering (Mathematics)	1,890	1,462	428	202	218	118	74	336	.....	—16	866	672
Engineering (Mechanical)	1,348	684	664	464	160	409	333	569	1	—10	329	440
Engineering (Structural)	556	385	171	88	16	53	33	69	....	—1	86	400
English	1,185	639	546	305	148	258	172	406	169	—19	312	448
Gardening	47	47	.....	.....	47	.....	.....	47	.....	.....	.....	.....
Geology	49	30	19	4	10	8	2	18	14	—3	7	21
German	530	358	172	94	114	78	36	192	158	—19	101	218
Highway Construction	148	148	.....	.....	8	.....	.....	8	.....	.....	140	.....
History	172	110	62	33	39	25	9	64	47	—8	38	62
Home Economics	33	17	16	15	15	2	2	17	.....	—1	6	9
Mathematics	1,220	851	369	179	177	94	65	271	58	—71	452	426
Meteorology	2	1	1	.....	.....	1	1	1	1	—1	.....	.....
Music	29	16	13	9	3	2	.....	6	.....	—2	7	14
Pharmacy	126	62	64	13	.....	14	14	14	.....	—9	46	57
Philosophy	87	64	23	10	18	17	4	35	29	—3	16	33
Physics	16	8	8	3	.....	1	.....	1	.....	—2	6	7
Political Economy	691	359	332	192	227	228	112	455	103	—5	77	154
Political Science	71	33	38	17	3	14	5	17	13	—3	15	42
Public Speaking	11	.....	11	11	.....	.....	.....	.....	.....	—1	.....	10
Romance Languages	304	172	132	69	104	51	33	155	99	—10	41	98
Surveying	39	35	4	3	.....	1	.....	1	.....	—2	26	10
Teachers' Reviews	263	190	73	37	22	19	10	41	.....	—6	115	101
Zoology	1	1	.....	.....	1	.....	.....	1	1	.....	.....	.....
Total	15,990	9,492	6,498	3,459	2,615	3,086	1,789	5,701	866	—251	4,404	5,634

TABLE VI

Correspondence-Study Texts

Written by Extension Teachers

Title	Author	Illustrations	Pages
Bookkeeping and Cost Finding for Printers	Fayette H. Elwell	.....	205
Electrical Meters	Cyril M. Jansky	271	370
Elementary Magnetism and Electricity	Cyril M. Jansky	(Fully illustrated)	212
Heat	Edward M. Shealy	110	262
Reinforced Concrete Construction (Vol 1)	George A. Hool	140	254
Reinforced Concrete Construction (Vol. 2)	George A. Hool	412	657
Retail Selling and Store Management	Paul H. Nystrom	.....	279
Shop Sketching	Joseph W. Woolley. Roy B Meredith	122	104
Shop Mathematics	Earl B. Norris	86	187
Advanced Shop Mathematics	Kenneth G Smith. Earl B. Norris	218	210
Steam Boilers	Ralph T. Craigo	185	356
The Elements of Structures	Edward M. Shealy	140	188
	George A. Hool		

TABLE VII

**List of Institutions Which Have Adopted the Extension Division Texts*

GROUP A

Extension Departments

University of Arkansas
University of California
University of Colorado
Columbia University, N. Y. City
Miners' and Mechanics' Institutes of the University of Illinois
Iowa State College
Kansas Agricultural College
University of Kansas
University of Minnesota
University of Nebraska
University of North Carolina
Oregon Agricultural College
Pennsylvania State College
University of Tennessee
University of Wisconsin

GROUP B

Colleges and Universities

Armour Institute of Technology
Brown University
Catholic University of America
University of Cincinnati

*This list was furnished by the publishers

College of the City of New York
Coast Artillery School, Ft. Monroe, Va.
Colorado College
Drexel Institute
College of Hawaii
University of Illinois
LaFayette College
University of Louisiana
Maryland Agricultural College
University of Maine
Massachusetts Institute of Technology
University of Minnesota
Montana State College
New York State Normal College, Albany
University of Nevada
Norwich University
University of Pittsburgh
Pratt Institute
Princeton University
Rhode Island State College
Rutgers College
University of Southern California
Texas School of Mines
Trinity College, N. C.
Tuft's College
Union College
U. S. Government Engineering School, Washington, D. C.
Nova Scotia Technical School
Utah Agricultural College
University of Washington

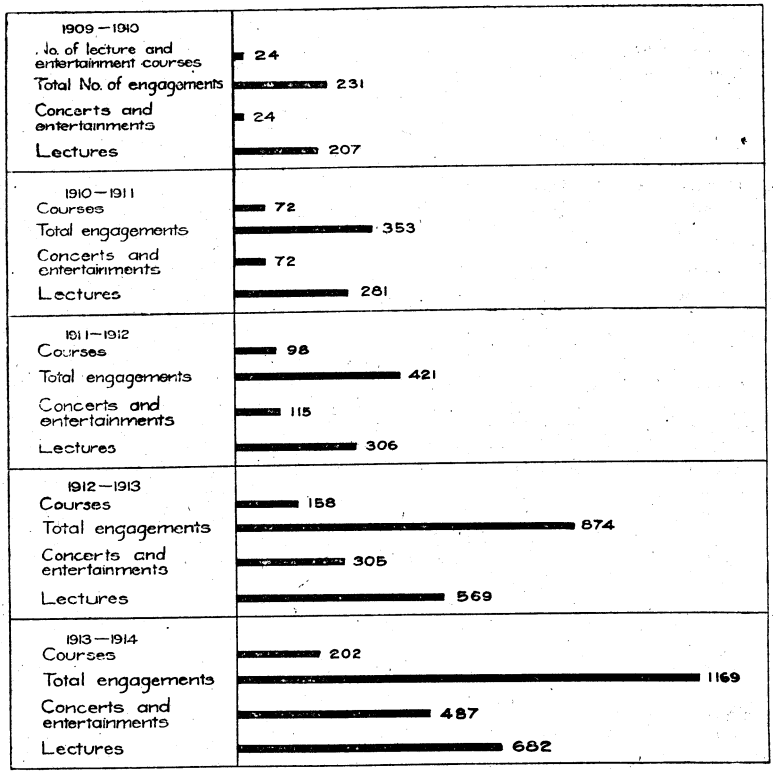
GROUP C

Miscellaneous Industrial Trade and Technical Schools

California—	Oakland, California Polytechnic College
"	Berkeley, Franklin Night School
"	Reprisa, State Prison of Folsom
"	San Francisco, Heald's Engineering School
"	San Francisco, Mare Island Navy Yard School
"	San Quentin, State Prison
Canada—	Shawanigan, Technical Institute
Connecticut—	Bridgeport, State Trade School
"	New Britan, State Trade Educational Shops
"	New Britan, Y. M. C. A. Class
"	New Haven, Y. M. C. A. Class
Colorado—	Salida High School
Illinois—	Aurora, Y. M. C. A. Class
"	Chicago, Crane Technical High School
"	Chicago, Lake Technical High School
"	Chicago, Lane Technical High School
"	Chicago Junction, High School
"	Granite City, Commonwealth Steel Co's Fellowship School

Kansas—	Pittsburgh, High School
"	Horton, High School
Massachusetts—	Boston, Mechanics Arts High School
"	Boston, Y. M. C. A.
"	Boston, Franklin Union
"	Boston, Wentworth Institute
"	Cambridge, Ringe's Technical High School
"	Fitchburg, Technical High School
"	Quincy, Fore River Ship Building Company Apprentice School
"	Quincy, Industrial School
"	North Chelmsford, Technical High School
"	West Lynn, General Electric Company's Apprentice School
"	Worcester, Y. M. C. A. Class
Michigan—	Detroit, Central High School
"	Ishpeming, Manual Training School
"	Lansing, Y. M. C. A. Class
Minnesota—	Duluth, Y. M. C. A. Class
"	Minneapolis, Y. M. C. A. Class
Missouri—	St. Louis, Y. M. C. A. Class
Nebraska—	Omaha, Y. M. C. A. Class
New Jersey—	Jersey City, Dickinson High School
" "	Jersey City, Evening Technical High School
" "	Newark, Technical High School
New York—	Buffalo Y. M. C. A. Class
" "	Buffalo Technical High School
" "	N. Y. City, Stuyvesant High School
" "	Rochester, Mechanics Institute
" "	Rochester, College of Locomotive Building
Ohio—	Cleveland, Y. M. C. A. Class
"	Dayton, Y. M. C. A. Class
"	Youngstown, Y. M. C. A. Class
Pennsylvania—	Erie, Y. M. C. A. Class
"	Lebanon, Y. M. C. A. Class
"	Pottstown, Y. M. C. A. Class
"	Tyrone, Y. M. C. A. Class
Washington—	Seattle, Y. M. C. A. Class
Wisconsin—	Racine, Y. M. C. A. Class

TABLE VIII



GROWTH OF LECTURE DEPARTMENT SERVICE
1909 TO 1914

TABLE IX

List of Social Center Bulletins Distributed

	No. of copies
An Introductory Statement, prepared by this Bureau	2,350
The Social Center,—The Means of Common Understanding, by Woodrow Wilson	2,400
Co-operation of the National Education Association, by Carroll G. Pearse	2,000
Lessons Learned in Rochester, by George M. Forbes	2,350
Motion Pictures and the Social Center, by John Collier	2,000
Present Conditions Which Demand Social Center Development, by Walter T. Sumner	1,650
The Rural Awakening, by Herbert Quick	2,850
The Schoolhouse as Branch Public Library, by C. E. McLenegan	2,000
Schoolhouse as Reference Bureau, by Charles McCarthy	2,000
Schoolhouse as Local Art Gallery, by Mrs. M. F. Johnstone	2,000
Schoolhouse as Recreation Center, by Clarence Perry	2,000
Schoolhouse as Local Health Office, by George B. Young	2,000
Social Center and the Farmer's Home, by P. V. Collins	2,000
Social Center Movement, by Josiah Strong	2,400
Social Center Movement in Minnesota, by Mrs. Mary Starkweather	2,000
The Civic and Social Center of the Community by this Bureau	1,350
Total number of bulletins distributed	33,350

Field Class Groups

District 1, 1912–1913

Subject	City	Meeting Place	Class Hour	Class membership	Teacher
Accounti'g Principles	Milwaukee ..	Extension Rooms...	7:30	15	Mr. Averill
Accounti'g Principles	Milwaukee ..	Extension Rooms...	7:30	6	Mr. Averill
Accounti'g Principles	Racine.....	High School.....	8:00	8	Mr. Averill
Bookkeeping.....	Milwaukee ..	Extension Rooms...	7:30	20	Mr. Averill
Bookkeeping.....	Milwaukee ..	Extension Rooms...	7:30	10	Mr. Averill
Bookkeeping.....	Watertown ..	.....	.....	20	Mr. Averill
Bookkeeping.....	Racine.....	High School.....	8:00	13	Mr. Averill
Cost Accounting.....	Racine.....	Extension School...	7:30	10	Mr. Averill
Engineering	S. Milwaukee	Public School	8:00	13	Mr. Winning
English Composition.	Ft. Atkinson	Heard's Pub Co.....	7:30	20	Mr. Beatty
Gas and Oil Engines..	Milwaukee ..	Public Museum.....	7:30	19	Mr. Smith
Law of Private Corporations.....	Racine.....	Public Library.....	8:00	18	Mr. Janecky
Law of Sales.....	Milwaukee ..	Public Library.....	8:00	19	Mr. Bartlett
Mathematics and Drawing	Ft. Atkinson	High School.....	7:30	27	Mr. Winning
Mathematics and Drawing.....	West Allis...	Kempsmith's	12:00	9	Mr. Winning
Mathematics, Draw'g, and Engineering....	Milwaukee ..	Cutler-Hammer Co.	8-12	10	Mr. Winning
Mathematics, Draw'g, and Engineering....	Milwaukee ..	Cutler-Hammer Co.	8-12	10	Mr. Winning
Medical Lectures.....	Milwaukee ..	Public Museum.....	8:00	59	Mr. Bunting
Medical Lectures.....	Milwaukee ..	Public Museum.....	8:00	39	Mr. Pierce
Plant Management...	Milwaukee ..	Public Museum.....	8:00	37	Mr. Schumacher
Plant Management...	Racine.....	Public Library.....	8:00	40	Mr. Mabie
Retail Selling.....	Racine.....	Public Library.....	7:30	49	Mr. Neystrom
Retail Selling.....	Stoughton....	Public Library.....	8:00	12	Mr. Neystrom
Shakspere.....	Milwaukee ..	Public Library.....	8:00	33	Mr. Beatty
Social Betterment....	Milwaukee ..	Public Library.....	8:00	28	Mr. Gillin
Social Service.	Milwaukee ..	Public Library.. ...	8:00	48	Mr. Gillin, Miss Alexander

District 2, 1912–1913

Accounting Principles.....	Appleton.....	Actual Business College.....	7:30	18	Mr. Treleven
Accounting Principles.....	Green Bay...	City Library..... ...	7:30	12	Mr. Treleven
Accounting Principles.....	Manitowoc...	Training School.....	8:00	23	Mr. Treleven
Bacteriology and Medicine	Oshkosh	Chamber of Commerce.....	8:00	65	Mr. Ravenel
Bookkeeping.....	Appleton.....	City Library.....	7:30	12	Mr. Treleven
Bookkeeping.....	Green Bay...	City Library	7:30	7	Mr. Treleven
Bookkeeping and Accounting.....	Fond du Lac.	Y. M. C. A.....	7:30	29	Mr. Treleven
Cost Accounting... ..	Oshkosh	Extension Rooms ...	7:30	9	Mr. Treleven
Engineering.....	Kaukauna...	Y. M. C. A.....	7:30	5	Mr. Meredith
Pharmacy Practice...	Oshkosh	High School	7:30	17	Mr. Langenhan
Engineering.....	Oshkosh	Extension Rooms ...	7:30	10	Mr. Meredith
Immunity from Disease.....	Appleton.....	Public Library.....	8:00	28	Mr. Ravenel
Gas and Oil Engines..	Appleton.....	High School	7:30	14	Mr. Meredith
Gas and Oil Engines..	Oshkosh	Extension Rooms ...	7:30	20	Mr. Meredith
Gas and Oil Engines..	Sheboygan...	High School	8:00	11	Mr. Meredith
Gas and Oil Engines..	Two Rivers..	High School	7:30	20	Mr. Meredith
Shop Mathematics....	Oshkosh	Extension Rooms ...	7:30	10	Mr. Meredith
Shop Sketching	Appleton	Public Library.....	7:30	12	Mr. Meredith
Shop Sketching	Fond du Lac.	Y. M. C. A.....	7:30	19	Mr. Hargrave
Shop Sketching	New Holstein	John Lawson Company.....	7:30	10	Mr. Hargrave
Shop Sketching	Oconto Falls.	High School	7:30	5	Mr. Meredith
Shop Sketching	Oshkosh	Extension Rooms ...	8:00	18	Mr. Meredith
Shop Sketching	Shawano.....	High School	7:45	5	Mr. Meredith
Sociology.....	Fond du Lac.	Grafton Hall	7:30	29	Mr. Melville
Sociology.....	Oshkosh	Extension Rooms ...	8:00	17	Mr. Melville
Wood Sketching	Oshkosh	Extension Rooms ...	7:30	8	Mr. Meredith
Wood Sketching	Sheboygan...	Public Library.....	7:30	13	Mr. Meredith

Field Class Groups

District 3, 1912–1913

Subject	City	Meeting Place	Class Hour	Class Membership	Teacher
Bookkeeping	La Crosse	Extension Rooms	7:30	7	Mr. Roseman
Bookkeeping and Cost Finding for Printers	La Crosse	Extension Rooms	8:00	7	Mr. Roseman
Electricity and Magnetism	Black River Falls	High School	7:30	4	Mr. Farley
Electricity and Magnetism	La Crosse	Extension Rooms	7:30	12	Mr. Faber
Electricity and Magnetism	Merrillan	High School	7:30	9	Mr. Logue
Elementary English	La Crosse	Extension Rooms	7:30	8	Mr. Roseman
Law of Contracts	La Crosse	Extension Rooms	8:00	13	Mr. Schlabach
Law of Private Corporations	La Crosse	Extension Rooms	8:00	5	Mr. Schlabach
Plumbing	La Crosse	Extension Rooms	7:30	8	Mr. Faber
Retail Selling	La Crosse	Extension Rooms	8:00	10	Mr. Roseman
Shop Mathematics	La Crosse	Sta-Rite Engine Co.	5:00	7	Mr. Faber
Shop Mathematics	La Crosse	Extension Rooms	7:30	10	Mr. Faber
Shop Mathematics and Drawing	Sparta	High School	7:30	7	Mr. Faber
Shop Sketching	La Crosse	Extension Rooms	7:30	12	Mr. Faber

District 4, 1912–1913

French	Superior	Paine, Weber Office.	8:00	15	Mr. Romieux
Law of Commercial Paper	Superior	Commercial Club	8:00	21	Mr. Hudnall
Pharmacy	Superior	Commercial Club	7:30	10	Mr. Leuders
Retail Selling	Duluth	Commercial Club	7:30	170	Mr. Fiske
Retail Selling	Superior	Floan and Leveroos Store	7:30	22	Mr. Close
Retail Selling and Store Management	Ashland	City Hall	7:30	15	Mr. O'Connor
Shop Mathematics	Ashland	City Hall	7:30	19	Mr. Johnson
Telephony	Superior	Wisconsin Telephone Company	7:30	7	Mr. Johnson
University Algebra	Superior	City Hall	8:00	6	Mr. Johnson

District 5, 1912–1913

Bookkeeping	Wausau	Extension Rooms	7:30	16	Mr. Day
Elementary English	Wausau	Extension Rooms	7:30	9	Mr. Sullivan
Lumber Measur'm'nts	Marshfield	City Hall	7:30	14	Mr. Edwards
Gas and Oil Engines	Wausau	Extension Rooms	7:30	8	Mr. Edwards
Money and Banking	Wausau	Extension Rooms	8:00	12	Mr. Hamilton
Retail Selling	Grand R'pids	Johnson & Hall Co.	7:30	33	Mr. Hamilton
Retail Selling	Wausau	Extension Rooms	7:30	21	Mr. Neystrom
Shop Drawing	Wausau	Extension Rooms	7:30	8	Mr. Edwards
Shop Mathematics	Grand R'pids	City Hall	7:30	10	Mr. Edwards
Shop Mathematics	Merrill	High School	7:30	8	Mr. Edwards
Shop Mathematics	Wausau	Extension Rooms	7:30	13	Mr. Edwards
Telephony	Wausau	Extension Rooms	7:30	7	Mr. Edwards

Field Class Groups

District 1, 1913–1914

Subject	City	Meeting Place	Class Hour	Class membership	Teacher
Accounting Principl's	Milwaukee...	Extension Building.	7:30	27	Mr. Kuchenmeister
Accounting Principl's	Milwaukee...	Extension Building.	7:30	10	Mr. Kuchenmeister
Accounting Principl's	Racine.....	Public Library.....	7:30	11	Mr. Kuchenmeister
Bookkeeping..... ...	Milwaukee...	Extension Building.	7:30	13	Mr. Kuchenmeister
Bookkeeping.....	Milwaukee...	Extension Building.	8:00	9	Mr. Kuchenmeister
Contemporary Literature.....	Milwaukee...	Public Library.....	7:30	70	Mr. Beatty
Cost Accounting.....	Milwaukee...	Extension Building.	7:30	13	Mr. Kuchenmeister
Gas and Oil Engines..	Port Washington.....	High School	7:30	13	Mr. Roberts
Public Speaking.....	Milwaukee...	Extension Rooms...	7:30	13	Mr. Buechen
Refrigeration	Milwaukee...	Extension Rooms...	7:30	20	Mr. Roberts
Refrigeration.....	Milwaukee...	Extension Rooms...	7:30	16	Mr. Roberts
Shop Mathematics, Drawing, and Engineering.....	Milwaukee...	Cutler-Hammer Co.	8:00 to 12:00 A. M.	15	Mr. Winning
Shop Mathematics, Drawing, and Engineering.....	Milwaukee...	Cutler-Hammer Co.	8:00 to 12:00 A. M.	9	Mr. Winning

District 1, 1913–1914

Spanish.....	Milwaukee...	Extension Building.	7:30	21	Mr. Reed
Water and Insect Borne Diseases.....	Milwaukee...	Milwaukee Medical Society.....	8:00	36	Mr. Ravenel
Watt-hour Meters....	Milwaukee...	T.M.E.R.& L.Co...	8-00 to 10:00 P. M.	28	Mr. Winning

District 2, 1913–1914

Accounti'g Principles	Appleton.....	Actual Business College	7:45	8	Mr. Langmas
Accounti'g Principles	Berlin.....	Public Library.....	7:30	15	Mr. Langmas
Accounti'g Principles	Green Bay...	Howe School.....	7:45	15	Mr. Langmas
Accounti'g Principles	New London.	City Hall	7:30	11	Mr. Langmas
Accounti'g Principles	Oshkosh.....	Extension Rooms ...	7:30	20	Mr. Langmas
Accounti'g Principles	Sheboygan...	High School..	7:30	17	Mr. Langmas
Accounti'g Principles	Waupun.....	High School.....	8:00	12	Mr. Langmas
Boilers.....	Fond du Lac.	High School.....	7:30	18	Mr. Elliott
Cost Accounting.....	Appleton	Actual Business College	7:45	20	Mr. Langmas
Cost Accounting.....	Menasha.....	High School..... ...	7:30	7	Mr. Langmas
Cost Accounting.....	Oshkosh.....	Extension Rooms...	7:30	5	Mr. Langmas
Credits and Collections.	Green Bay...	Public Library.....	7:45	9	Mr. Langmas

Field Class Groups

District 2, 1913–1914

Subject	City	Meeting Place	Class Hour	Class Membership	Teacher
Gas and Oil Engines..	Berlin.....	Public Library.....	8:00	10	Mr. Elliott
Gas and Oil Engines..	Neenah.....	High School.....	7:30	23	Mr. Elliott
Gas and Oil Engines..	Waupun.....	High School.....	8:00	10	Mr. Elliott
Gas and Oil Engines..	Sheboygan...	Industrial School....	7:30	11	Mr. Elliott
Law of Sales.....	Oshkosh.....	Extension Rooms....	7:30	14	Mr. Clark
Power Plant Machinery	Fond du Lac.	High School.....	7:30	10	Mr. Elliott
Problems of City and Rural Life	Green Bay...	Howe School.....	7:30	22	Mr. Melville
Problems of City and Rural Life.....	Kaukauna...	Training School.....	7:30	15	Mr. Melville
Problems of Population.....	Oshkosh.....	Extension Rooms....	7:30	17	Mr. Melville
Retail Selling.....	Fond du Lac.	High School.....	7:30	34	Mr. Field
Retail Selling.....	Kaukauna...	High School.....	7:30	22	Mr. Field
Retail Selling.....	Kaukauna...	Torrison's Store.....	7:30	29	Mr. Field
Retail Selling.....	Neenah.....	High School	7:30	26	Mr. Field
Retail Selling.....	Oshkosh.....	Extension Rooms....	7:30	27	Mr. Field
Shop Mathematics and Drawing	Clintonville..	High School.....	7:30	11	Mr. Elliott
Shop Mathematics and Drawing.....	Kaukauna...	High School.....	7:30	10	Mr. Elliott
Shop Mathematics and Engineering....	Oshkosh.....	Extension Rooms....	7:30	20	Mr. Elliott
Teaching Problems..	Two Rivers..	High School.....	8:00	10	Mr. Clapp
Teaching Problems..	Waupaca	High School.....	8:00	21	Mr. Clapp

District 3, 1913–1914

Accounti'g Principles	La Crosse....	Extension Rooms ..	7:30	6	Mr. Roseman
Chemistry	La Crosse....	State Normal School	4:00	7	Mr. Bernhard
Chemistry	La Crosse. ..	State Normal School	7:30	12	Mr. Bernhard
Drawing and Engineering.....	La Crosse....	Extension Rooms...	7:30	25	Mr. Faber
Dynamos...	La Crosse...	Extension Rooms...	7:30	11	Mr. Faber
Electricity and Magnetism	Black River Falls.	High School.....	7:30	10	Mr. Farley
Electricity and Magnetism	Merrillan	High School.....	7:30	4	Mr. Logue
Gas and Oil Engines..	La Crosse....	Extension Rooms...	7:30	8	Mr. Faber
Law of Commercial Paper	La Crosse....	Extension Rooms...	7:30	8	Mr. Schlabach
Money and Banking..	La Crosse....	Y.M.C.A.....	7:30	21	Mr. Trent
Retail Selling.....	La Crosse....	Extension Rooms...	7:30	10	Mr. Field
Shop Drawing.....	Viroqua.....	High School.....	7:30	7	Mr. Ottman
Shop Mathematics....	La Crosse....	Extension Rooms...	7:30	11	Mr. Field.

District 4, 1913–1914

Bookkeeping.....	Ashland.....	City Hall.....	7:30	12	Mr. Stoehr
City Problems in Social Welfare.....	Superior.....	Commercial Club...	8:00	11	Mr. Burt
Electricity and Magnetism.....	Ashland.....	City Hall.....	8:00	15	Mr. Weaver
Electricity and Magnetism.....	Superior.....	High School.....	8:00	18	Mr. Weaver
Gas and Oil Engines..	Superior.....	High School.....	8:00	11	Mr. Weaver
Elementary English..	Ashland	City Hall.....	7:30	14	Mr. Withers
Elementary English..	Moquah.....	School House.....	7:30	22	Mr. Duffy

Field Class Groups

District 4, 1913–1914—Continued

Subject	City	Meeting Place	Class Hour	Class membership	Teacher
Gas and Oil Engines..	Bayfield	Office of H.C.Hales.	8:00	15	Mr. Weaver
Gas and Oil Engines..	Washburn....	Commercial Club ..	8:00	15	Mr. Weaver
Gas and Oil Engines..	Ashland	City Hall.....	8:00	26	Mr. Weaver
German	Superior	High School.....	7:30	14	Miss Hawley
Law of Commercial Paper.....	Ashland	City Hall.....	7:30	14	Mr. Dillon
Law of Private Corporations.....	Superior.....	U. S. Nat'l Bank....	8:00	14	Mr. Hudnall
Retail Selling.....	Superior.....	High School.....	8:00	109	Mr. Close
Retail Selling.....	Washburn....	Public Library.....	8:10	10	Mr. O'Connor

District 5, 1913–1914

Accounti'g Principles	Wausau.....	Extension Rooms...	7:30	7	Mr. Ingham
Bookkeeping.....	Wausau.....	Extension Rooms. .	7:00	13	Mr. Ingham
Gas and Oil Engines..	Wausau.....	Extension Rooms...	7:30	6	Mr. Mitchell
Law of Sales.....	Wausau.....	Extension Rooms...	7:30	9	Mr. Rosenberg
Mathematics.....	Wausau.....	Extension Rooms...	9:00	7	Mr. Edwards
			A. M.		Mr. Mitchell
Mathematics, Draw'g, and Engineering....	Antigo.....	City Hall.....	7:30	12	Mr. Edwards
					Mr. Mitchell
Mathematics, Draw'g, and Engineering....	Gra'd Rapids	City Hall.....	7:30	12	Mr. Edwards
					Mr. Mitchell
Mathematics, Draw'g, and Engineering....	Marshfield...	City Hall.....	2:30	16	Mr. Edwards
			11:30		Mr. Mitchell
Mathematics, Draw'g, and Engineering....	Merrill.....	City Hall	7:00	23	Mr. Edwards
					Mr. Mitchell
Mathematics and Engineering	Stevens Pt...	Public Library.....	7:30	8	Mr. Edwards
					Mr. Mitchell
Mathematics and Engineering	Wausau	Extension Rooms...	7:00	28	Mr. Edwards
					Mr. Mitchell
Retail Selling.....	Merrill.....	City Hall.....	8:00	21	Mr. Field
Retail Selling.....	Neillsville...	High School.....	7:45	26	Mr. Field
Retail Selling.....	Stevens Pt...	City Hall.....	8:00	26	Mr. Field
Retail Selling.....	Thorp.....	High School.....	7:30	7	Mr. Hamilton
Shop Drawing.....	Wausau	Extension Rooms....	7:00	12	Mr. Edwards
					Mr. Mitchell
Window Trimming...	Wausau	Extension Rooms...	8:00	10	Mr. Field

District 6, 1913–1914

Electricity & Magnetism.....	Eau Claire...	Extension Office.....	7:00	9	Mr. Hobbs
Gas & Oil Engines....	Baldwin	High School.....	7:00	24	Mr. Hobbs
Gas & Oil Engines....	Eau Claire...	Extension Office.....	7:00	15	Mr. Hobbs
Gas & Oil Engines....	Ladysmith...	Training School.....	7:00	19	Mr. Hobbs
Gas & Oil Engines....	Rice Lake ...	Public Library.....	7:00	16	Mr. Hobbs
Labor Problems	Eau Claire...	Union Hall.....	8:30	4	Mr. Ames
Law of Commercial Paper....	Eau Claire...	Public Library.....	7:30	10	Mr. Doolittle
Mathematics..	Eau Claire...	Extension Rooms...	7:30	6	Mr. Hobbs
Mathematics & Engineering.....	Stanley	City Hall.....	7:00	4	Mr. Hobbs
Retail Selling.....	Eau Claire,..	Library.....	7:30	42	Mr. Field
Retail Selling.....	Stanley	City Hall.....	7:00	20	Mr. Field
Retail Selling & Store Management.....	Eau Claire...	Library.....	7:30	20	Mr. Field

REPORT OF THE DEAN OF WOMEN

President Charles R. Van Hise,
The University of Wisconsin,

Dear Sir: I beg leave to submit herewith my report as Dean of Women for the biennium ending October 1, 1914. During that time the staff of this department of University administration has been increased because of the more complete organization which has been brought about during the past four years, and also because the work of the department has grown in a direct ratio to the increase in the number of women students registered in the University. In order that this increase may be made as clear as possible the registration for the last four years should be compared.

Number of Women Students in the regular sessions:

In 1911–12 1165
In 1912–13 1205
In 1913–14 1328

The Summer Session has increased likewise until the summer of 1913 there were registered in the University 858 women students, 688 of whom were not in the regular session. From the beginning of Summer Session June, 1913, to the beginning of Summer Session, 1914, counting but the regular session and the Summer Session, the total number of women students under the care of this office was 2016.

In the year 1913–14 these students were classified as follows:

	In Regular Session	In Summer Session	Total
	(Not including duplicates)		
Letters & Science	860	342	1,202
Agriculture (Home Economics)	212	58	270
Medicine	2	0	2
Law	6	1	7
Engineering	0	1	1
Music	90	8	98
Pharmacy	1	0	1
Library	28	0	28
Short Course	0	0	0
Graduate Students	129	278	407
	1,328	688	2,016

An approximate idea of the distribution of the young women as to residence may be obtained from the following figures which are for October 1, 1913:

In Chadbourne Hall	117
In Barnard Hall	137
In sorority houses	200
In lodging houses and private families	456
In own homes, or with relatives	332
	1,242

Organization

The care of this whole body of young women falls upon this office, the staff of which at the present time consists of:

The Dean of Women, The Mistress of Chadbourne Hall, The Mistress of Barnard Hall, one full time assistant, one half time assistant, a secretary.

Exactly the character and scope of the work which each member of the staff undertakes will be given later in this report. Since the last biennial report was submitted, the Dean of Women and her staff have developed considerably the organization and (it is hoped) the influence of the work among the women students. The principles upon which this organization and work have been undertaken are three: first, the endeavor to do all that can be done to develop the possibilities of women's education in this coeducational institution; second, to secure to the women students the highest possible individual development,—intellectual, moral, spiritual, and social; third, to develop in these women students the highest social responsibility,—to the family, the civic community, the economic group, and the state. These purposes are far from being achieved; but the work of the department has nevertheless aimed at realizing this distant vision. With these ideals in mind, the organization for their accomplishment has fallen into three departments,—those of administration, of academic duties, and of social duties.

I. Administration

Along the lines of administration the work of the Dean of Women is that of helping where she may to shape University policy, especially where women students are concerned. The principal ways in which this aid is rendered are:

1. Participation in the work of regular faculty committees, of five of which the Dean of Women is a member:

a. The Executive Committee of Student Advisers in the Col-

lege of Letters and Science, which meets weekly; and in the College of Agriculture, with which she meets only two or three times a year, since the Director of the Course in Home Economics keeps in very close touch with that work.

b. The Committee on Student Life and Interests, which has just been organized, and of which she is assistant chairman.

c. The Lathrop Hall Committee, which has charge of the administration of the social side of Lathrop Hall. The work of this committee is shown in the pamphlet of rules governing Lathrop Hall.

d. The Committee on Discipline, which takes up the cases of dishonesty in University work, in cases where women are concerned.

e. The Committee on Appeals, in cases in which women are concerned.

Besides these committees on which the Dean of Women herself serves, the Mistress of Chadbourne Hall serves on the Committee of Loans and Scholarships in place of the Dean of Women. An assistant to the Dean of Women serves on the Committee of Time Tables in place of the Dean of Women. Doctor Morris, the Medical Adviser for Women, has served on the Committee on Hygiene in place of the Dean of Women.

2. Work on special committees. For instance:

a. The Committee on the Relations between the Library School and the College of Letters and Science, which met frequently for one month in the fall.

b. The special committee on Extra Curriculuar Activities, which had frequent meetings for three months during the winter.

Besides these, the Dean of Women has served as an elective member of the Regent-Faculty Conference. She also meets occasionally with the heads of the women's organizations; with the Pan Hellenic Association three or four times in the year; with the house mothers of sorority houses as often as occasion may arise; with the Self Government Association Board four times last year.

In addition the Dean of Women makes special addresses and gives informal talks before smaller groups of students—the seniors, the juniors, the sophomores, the freshmen, the King's Daughters (an Episcopal organization), Castalia Literary Society, etc.

Under her direction also are:

1. The Vocational Conference; 2. The Vocational Guidance (where but small beginnings have been made); 3. The oversight of the lodging houses; 4. The employment office for students needing work, and loans and scholarships made to undergraduate girls. This side of administration is divided as will be shown later among her assistants.

II. Academic Duties

1. The academic duties of the Dean of Women overlap in some places on the administration noted above. For instance, the work of the Executive Committee of Student Advisers in the College of Letters and Science, as well as in the College of Agriculture, is very largely academic, although some of it is also administrative. Because of her membership on these committees, all the girls who are not doing satisfactory work for any reason must report to the office of the Dean of Women;—the seniors, juniors, sophomores, and graduate students to the Dean of Women herself, the freshmen to her assistant, Miss Lily B Campbell, who is also instructor in English. To the office of the Dean of Women are reported absences, delinquency in back work, requests for dropping work, and requests to do more than sixteen hours of work. The Dean of Women and her assistant go over the cases and report them to the appropriate college. In this field there lies a very large amount of work, which requires both delicacy and a wide knowledge of University problems.

2. The Dean of Women teaches in the History Department, giving one course three hours a week. The second semester of 1913–14 she did not give this course, but prepared a new one, which is being given this year (1914–15). She also had a group of students (8) doing their senior theses in History, whom she had at least two hours each week throughout the year in conference. Besides this work, she serves on special committees in the History Department from time to time, as they may be required, and attends the departmental meetings of that department. She is in constant touch with the department at all times.

For Miss Campbell's academic work see a later note.

III. Social Duties

On the social side:

The Dean of Women meets the freshmen and returning students for seven hours a day, during the days of registration, and has tried various plans for meeting other students at the beginning of the year.

She is present at the student functions for welcoming new students, and gives constant aid to junior girls, and to the Young Women's Christian Association, in their work of advising freshmen.

On Thursdays, from November to May, she was at home last year to the women in the lodging houses, taking two houses a week, from 4:30 to 6 o'clock, serving tea and meeting them socially. This year she is at home on Thursday afternoons in Lathrop Hall from November to the Easter recess to every woman student who may care to come.

Once a year she gives a luncheon for the heads of the women's organizations, and from time to time she gives dinners and luncheons to University guests, such as deans of women from other universities. These expenses are paid out of her salary; last year they amounted to more than two hundred dollars. She also dines with students in the halls, at the sorority houses, and at the boarding houses, upon invitation, as time and strength permit. She is usually at every sorority house and boarding house once a year at least. When girl students give entertainments she is asked to receive, and does so as far as her strength permits. She is called upon constantly for social duties which she finds herself unable to meet by limitations of hours of the day, and days of the week.

In addition to this, it should be noted that the Dean of Women is in constant communication during the college year with the Medical Adviser, with the Department of Physical Education, with the advisers of students, and by letter with parents, in order that the underlying principles mentioned at the beginning of this report may be carried out. She does not receive from parents such co-operation as she could wish; many of the letters remain unanswered, in spite of the time and care with which they are composed.

The office falls far short of its purposes, as must any office

where high ideals are maintained, but so far as your Dean of Women knows, there is no office in a state university which undertakes and accomplishes as much work for students as does this office. This statement is based upon the reports made of conferences of deans of women of state universities, held biennially in Chicago in December of the odd years—1911–1913–1915, etc., as well as by conferences with individual deans who have visited this office. The work requires much informality, inasmuch as there is great delicacy required in much of its work; it should have more clerical assistance than it has been able to command in the past, as well as a highly paid executive secretary, who could carry on efficiently the correspondence and duties which demand attention during the summer month. This need has become more apparent with the increasing complexity of administering the halls of residence so as to give to Wisconsin girls preference in assignment of rooms.

Following is a statement of the work of the definite members of the department for 1913–14, exclusive of the Dean of Women:

Miss Katharine S. Alvord, Mistress of Chadbourne Hall. In charge of the Vocational Conference, in charge of the Vocational Guidance, in charge of the Loans and Scholarships, in charge of the employment work.

Miss Lily B. Campbell, in charge of the freshman girls, in charge of Lathrop Hall, instructor of English three hours a week.

Mrs. L. M. Vandervort, Mistress of Barnard Hall (1913–14), in charge of the home nursing lectures and demonstrations in the Home Economics Department.

Mrs. Grace H. Keller, half time assistant from March 1 to June 15, 1914, in charge of the lodging house inspection, etc.

WOMEN STUDENTS' ORGANIZATIONS

With regard to the women's organizations it is necessary to say but little in addition to what was set forth in the last biennial report. The Self Government Association is becoming yearly more efficient. Its judiciary committee, which is founded upon very simple lines, has had but few cases brought before it, and those cases have been dealt with only by reprimand. The Self Government Association has become a powerful instrument in shaping and enforcing public opinion. It has been found almost

unnecessary to go beyond a reprimand in order to keep the standard of the social life among the girls up to what one has a right to expect in this community.

The chairmen of the lodging houses and the Self Government Association representative in each of the sorority houses are coming to feel more keenly the importance and responsibility of their position. The situation is not yet ideal, but it is improving year by year. The life in the two halls, Chadbourne and Barnard, proceeds along the lines of healthy, high-minded life among those groups. Miss Alvord, who was mistress of Chadbourne Hall for five years, did much to make Chadbourne Hall one of the great centers of the student life among the girls. Mrs. Flett, who this fall takes Miss Alvord's place, is a graduate of the University, and will certainly carry on even farther the work which Miss Alvord began. Miss Mason, who has come this year to Barnard Hall will undertake to work along the same lines as have been followed in Chadbourne Hall. It is unfortunate that there is no parlor in Barnard Hall large enough to accommodate all the young women for a house meeting, but the parlor of Lathrop Hall is available for that purpose on alterating Tuesday evenings and thus the difficulty is in part overcome.

LATHROP HALL

Lathrop Hall itself is coming to be used by the young women more and more, and to be considered by them as the center of their social life. With the removal of the Home Economics Department to their own building the fifth floor is available during the day time for the Department of Physical Education, and in the evening for the use of the women students. On Friday evenings two of the literary societies will hold their meetings there, and the rooms will be available on Saturday evenings for informal gatherings of women students—committees, small organizations of girls, etc. Your Dean of Women is, as has been said, at home in the tea room of this hall on Thursday afternoons from the first of November to the Easter vacation for any young women who choose to come in for a cup of tea. The parlor is available to the young women for receiving their callers on Wednesday and Sunday evenings. The hall has not yet reached the limit of its availability for the women students, but each year sees its use increased and the fact of its possession better appre-

ciated. By making the dining-room into a large cafateria and using the old cafeteria for luncheons, dinners, etc., given by organizations, the use of the hall is still further extended and varied.

SUMMER SESSION

During the past two years the Summer Session has come to be almost a regular part of the academic year. The Director of the Summer Session has cordially assisted in making possible the continuity of policy regarding women students throughout the entire year. To this end there has been appointed a Dean of Women for the Summer Session, who has also been head of Chadbourne Hall. For the past two years this position has been held by Miss Winifred Robinson, now Dean of the newly founded Women's College of Delaware. For two summers Barnard Hall has been open to summer students, and a head of this hall has been provided. In the summer of 1914 Miss Martha Doan, instructor in Chemistry in Vassar College, held this position. The work of the two years has made it possible to provide in the Summer Session the segregation of women students in lodging houses just as has been done throughout the year. There have also been house committees in the halls, and house rules, somewhat simplified over those enforced in the regular session. The Student Interests' Committee has carried its work through the Summer Session, and the Dean of Women for the Summer Session has been *ex-officio* one of its members. Thus the work of the Summer Session has been brought into line with what your Dean of Women undertakes to do throughout the year; the result has been considerably to strengthen the work of her office.

FUTURE NEEDS

The immediate future needs for the women students seem to your Dean of Women not numerous, yet somewhat imperative. It is with reluctance that they are brought forth, since anyone acquainted with the situation realizes how unusually generous the State of Wisconsin has been in providing accommodations and administration for its women students. It is, perhaps, just because so much has been done that a little more seems of such importance.

The first need is that of a co-operative house, such as is administered in Wellesley and Smith Colleges, and in Northwestern University. In such a house the young women who reside within its walls might work from an hour to an hour and a half a day, thereby reducing very materially their expenses. It is almost impossible for us to open such a house unless the building itself were a gift. Rents are so high in Madison that that item alone would preclude its success if the enterprise were to be carried on in a rented house. If a building could be put up by the state in which the rooms could be rented at a minimum, and where the supervision could be under the Department of Home Economics the house might be made to subserve a triple purpose—that of cutting down the expenses of a group of sixty girls, of rendering possible another sort of laboratory for the Home Economics Department, and of caring for a group of girls who either do not come to the University, or undertake to work for their room and board under circumstances which are not always the most healthful or stimulating. Such a house should accommodate about sixty students, should pay its own expenses, and cut down for each student so housed the expenses per year for room, board, and laundry to less than $150. This statement is made on the basis of what has been done at Northwestern University, where Dean Potter has made the plan a great success.

The second need which your Dean of Women wishes to have considered is the separation of the Department of Physical Education for women from that of the men. The end, aim, and work of physical education for women are not the same as those for men. The tendency among young women—in a coeducational university, as it is also in a woman's college,—is to develop sports and games along the lines of men's sports and games, whereas many physical directors, physicians, and administrators believe that the possibility of developing sports and games for women along quite different lines has not yet been in the least realized. The Department of Physical Education for Women is in many coeducational institutions a separate administrative department, under a woman as director, and left quite free to develop along its own lines. Your Dean of Women would like to see the matter considered.

Respectfully submitted,

LOIS KIMBALL MATHEWS,

Dean of Women.

REPORT OF THE DIRECTOR OF THE SUMMER SESSION

President Charles R. Van Hise,
The University of Wisconsin.

Dear Sir: I have the honor to submit to you herewith a brief report of the Summer Session of the University for the biennium July 1, 1912 to June 30, 1914.

It is a pleasure to be able to report that the rapid growth of the Session has continued uninterruptedly, and that both the quality of its work and the character of its student body are steadily improving from year to year. In its early stages the majority of the students were not working for academic credit, there were very few of our own undergraduates enrolled, and only the larger departments of one, later two, colleges were represented. At the present time all the colleges are included, practically all the departments are giving their standard courses, University of Wisconsin undergraduates make up almost one-third of the total enrollment, approximately nine-tenths of the entire student body is working for academic credit, and the group of "preparatory and unclassified special" students, amounting to less than one-tenth of the whole, is apparently decreasing in numbers.

In the Session of 1913 approximately 33½ per cent of the students were graduate students, 57 per cent were regular college undergraduates from our own and other institutions, and 9½ per cent were preparatory and special students. About 52 per cent of the whole number were teachers. It is also gratifying to note in this connection that while our Summer Session naturally appeals more widely to non-residents than the semesters—teachers being free to come to us in the summer—Wisconsin still sends more than one-half of our total enrollment—934

students in 1912, 1076 in 1913. In 1912, 736 students came from 45 other states and 60 from 18 foreign countries; in 1913, 991 from 44 other states and 53 from 15 foreign countries.

Analysis of Attendance

	1912	1913
a) By Colleges:		
Letters and Science	1,246	1,557
Engineering	204	188
Law	63	74
Agriculture	217	301
Totals	1,730	2,120
b) By Classes:		
University of Wisconsin graduates	162	247
Other graduates	399	463
University of Wisconsin undergraduates	575	649
Other undergraduates	383	562
Preparatory and unclassified	211	199
Totals	1,730	2,120
c) By States and Foreign Countries:		
From Wisconsin	934	1,076
From other states	736	991
From United States	1,670	2,067
From foreign countries	60	53
Totals	1,730	2,120
d) Teachers:		
College and Normal Instructors	146	186
Superintendents, Principals, and High School Instructors	645	627
Other Teachers	141	301
Total Teachers	932	1,114

The temper of the student body as a whole is most excellent; there is an extraordinary degree of purpose and seriousness as well as of ability displayed in their work, and leading faculty men have repeatedly declared that their summer teaching, although arduous, is the most satisfactory of the year as regards results.

THE STAFF

The splendid spirit of our instructional corps in all the colleges, its devotion to the work of the Session and to the interests of the University is worthy of all commendation. In the College of Letters and Science rich programs of lectures, demonstrations, and round tables, embracing the most varied topics of interest, are offered each week, regardless of the fact that no additional remuneration is granted for such work. These lec-

In 1912, 153 men and women, of whom 13 were from other able asset to the Summer Session as a whole.

In 1912, 153 men and women, of whom 13 were from other institutions, composed the instructional staff, an average of one instructor to 11 students. In 1913, there were 161, eight of whom were from without, an average of one instructor to 13 students.

Degrees Conferred

During the biennium degrees were conferred as follows:

	1912	1913
B. A., B. S., Ph. B., Ll. B.	36	86
M. A., M. S., E. E.	24	23
Ph. D.	5	8
Totals	65	117

Financial Statement

	1912	1913
a) Expenditures, by Colleges:		
Cash.		
Letters and Science	$16,986	$18,554
Engineering	4,249	4,651
Law	1,200	1,538
Agriculture	2,826	3,418
Administration	3,326	3,844
Fees refunded	398	*
Totals	$28,985	$32,005
b) Deferred Salaries, Cash Salary Basis, by Colleges:		
Letters and Science (30 instructors)	$8,613	$10,339 (30 instruct.)
Engineering (1 instructor)	244	.....
Law (3 instructors)	1,611	1,250 (2 instruct.)
Agriculture (1 instructor)	186	580 (2 instruct.)
Totals (33 instructors)	$10,654	$12,169 (34 instruct.)
Estimated Total Expense	$39,639	$44,174
	1912	1913
c) Receipts, by Colleges:		
Letters and Science	$18,675	$22,996
Engineering	2,137	2,328
Law	1,545	1,755
Agriculture	2,917	4,500
Gymnasium fees	450	438
Totals	$25,724	$32,017

* Refunded fees not reported in receipts, as heretofore.

By reason of the very considerable increase in enrollment, the expense of conducting the Session became proportionately less during the biennial period. The estimated total expense per student for 1912 was $22.90, total receipts per student, $14.90, hence the actual cost was about $8 per student. For 1913, the expense amounted to $20.88, the receipts $15.10, and the actual cost $5.78 per student. This includes, of course, no estimate of "overhead charges," but simply the actual expense of instruction and administration as shown in the tables.

In 1913 the cash receipts balanced the cash expenditures for the Session, leaving as a deficit the deferred salaries of 34 instructors—on a cash salary basis, $12,169. This, therefore, represents the total expense to the University of maintaining both a large and flourishing Summer Session, and a satisfactory leave-of-absence system. Thirty-three instructors elected leave of absence instead of cash remuneration in 1912 and 34 in 1913. It should be added, however, that for various reasons—resignation and removal, financial stringency, etc.—faculty members frequently change their plans and surrender their earned leave for cash later on.

THE COLLEGES

The College of Letters and Science gained 431 students, or 38 per cent, during the two years under consideration. On the scholastic side the large departments of English, Education, German, History, and Chemistry are doing the bulk of the work, and are attracting ever increasing numbers of teachers of both our own and other states. Of newer departments Manual Arts and Physical Education showed an excellent development. The art work has been consistently maintained, and a gratifying interest has been shown. It is to be hoped that the professorship in this department will soon be filled by a permanent appointment. The work in Political Economy and Political Science has been in an unsatisfactory condition. The courses needed systematizing and the summer work had been left too much to outsiders. These matters will be corrected. With their new building and equipment the biological departments should now build up rapidly.

The College of Engineering has decreased in enrollment about 15 per cent during the two years. The work, however, is in

excellent hands, the program could not be reduced without crippling it greatly, and I am convinced that the depression—which corresponds to a falling off in numbers during the academic year—is only temporary.

The Law School has increased about 30 per cent, and the men in charge report that the students who begin their law work in the summer—mostly teachers—are the best class of students they receive.

The College of Agriculture has had a wonderful growth of 129 per cent during the two years. The demand was surprisingly great, and we have had to expand the course of study rapidly to meet it. Now practically all the departments are represented, and the best teachers are on the staff. There is a good attendance of agricultural educators from the Middle West and South.

SOCIAL LIFE

The social life of the Summer Session might well serve as a model for that of the academic year. Almost none of the objectionable features develop, and at the same time the students enter with greatest zest into what is offered them. The singing hours, the play hours, the sociables, the band concerts begun in 1913, the festival at the close—all are splendidly attended and very successful. Great credit for these affairs is due to Professors Dykema, Bassett, Jones, Trilling, Elsom, and Mann of our own staff.

VESPER SERVICES

The Sunday evening Vesper Services, inaugurated in 1913, and conducted with the assistance of the Madison Association of Student Pastors and Y. M. C. A. secretaries, has apparently met a real want. From 200 to 400 were in attendance at each service, and the superb natural beauty of the scene lent an effect of genuine grandeur to the simple exercises.

TENTING COLONY

The plan recommended in the last biennial report was attempted in a modest way in 1913 and proved fairly successful as a beginning. I heartily recommend a continuation of it, since

it promises to enable school men with large families and small salaries to attend, who could not pay the prices for room and board demanded in the city.

BATHING FACILITIES

The great crying need of the Summer Session has always been a suitably equipped and well located bathing house and pier for women. The desirable privacy and proper supervision are impossible without it, and with the rapid growth of the Session, the need becomes ever more imperative. I wish to urge once more the necessity for immediate action in this matter.

Respectfully submitted,

S. H. GOODNIGHT,

Director.

REPORT OF THE DEAN OF THE GRADUATE SCHOOL

President Charles R. Van Hise,
The University of Wisconsin.

Dear Sir: I submit to you herewith my biennial report as Director (subsequently Dean) of the Graduate School for the period ending June 30, 1914. The financial element involved in the maintenance of the Graduate School is not here considered since I am not directly concerned in its administration.

The experience of the past two years has confirmed the impressions set forth in my report of 1912 that the new form of organization for the Graduate School adopted in 1910, while defective in some respects, is nevertheless workable. Some of these defects have indeed been eliminated during the past biennium and I take pleasure in recording here a substantial enlargement of the functions of the Graduate Faculty. By recent action of the Regents, it now exercises over graduate work powers similar to those of the college faculties with reference to undergraduate study. I anticipate that this increased responsibility will produce increased efficiency and increased interest on the part of its members.

Among the more important subjects affecting graduate work that have come before the faculty during this period, I note the following as of special interest since they involve the relations of the University to other similar institutions in matters that have been the subject of much inter-university discussion: Upon the recommendation of the Association of American Universities, the procedure to be followed in the nomination of appointees to fellowships and scholarships has been revised with a view to more prompt exchange of information among co-operating universities. The inconvenience resulting from acceptance by one person of ap-

pointments in two or more universities has in consequence nearly disappeared.

While it is the desire of the Graduate School to conform as nearly as may be to the general lines of practice adopted by other American universities, the Graduate Faculty has not been able to adopt in its entirety the recommendation of the Association of American Universities "That no greater credit be extended by any member of the Association to the diplomas of normal schools and minor colleges than is accorded by the state university of the state in which such institution is located." It appearing that a rigid application of this rule would frequently work hardship in the case of mature candidates who have been many years out of college, the faculty, while sympathizing with the purpose sought to be accomplished, has adopted for its guidance in such cases the following statement: "No consideration will be given to the diplomas of the institutions above described but the Dean and the Graduate Committee will receive and will consider upon their merits, without prejudice upon account of such diploma, application from candidates claiming to possess attainments equivalent to those represented by an approved baccalaureate diploma." This action should be construed in connection with the following statement of practice: It is the policy of The University of Wisconsin to admit to its Graduate School the holders of baccalaureate degrees conferred by reputable colleges, even though their standards of graduation fall below our own. But such admission will be made subject to the following limitations:

A. Admission will not be accorded to graduates of institutions whose requirements for graduation fall more than one year short of the Wisconsin standard.

B. The actual deficiency that exists in any given case must be removed before the candidate receives a second degree either (1) by absolving the specific difference between the Wisconsin baccalaureate and the one in question or (2) through such undergraduate or graduate work in addition to that normally required for the higher degree as may be assigned by the Dean of the Graduate School and the student's major professor acting together.

The policy of permitting candidacy for the Master's degree to be conducted partly *in absentia* has from its inception been regarded as a tentative, one that must be justified by its results.

These results are now sufficiently in evidence to permit at least a provisional judgment in the matter. This judgment, based upon conference with my colleagues who are engaged in giving instruction under the system, is distinctly so favorable to the plan that its continuation and development should be regarded as a normal part of University policy. During the period covered by the present report there has, indeed, been adopted an extension of *absentia* candidacy for a degree that may prove to be of considerable importance, *viz.*, the introduction into graduate work of the accredited farm relation. Under this system, candidates for the M. S. degree pursuing work in agriculture may receive not to exceed one semester's credit for a year's residence and work under supervision upon a farm previously approved by a University officer designated for that purpose. It is expected that such work will be chosen by candidates preparing themselves for the position of farm manager, who desire to secure under favorable conditions experience comparable with that furnished by a hospital or law office to the prospective physician or lawyer. While this work has already been elected by a limited number of candidates, it would be premature to pass judgment at this time upon their success or its value.

In connection with candidacy for the Master's degree "partly in *absentia*" I may also call to your attention the action of the Graduate Faculty whereby all such candidates are advised that the University reserves to itself the right to exact four summer sessions of attendance instead of three in those cases in which the normal amount of *absentia* work proves unduly burdensome to the candidate. A corresponding diminution of the *absentia* work is then made.

The numerical growth of the Graduate School, although subject to considerable fluctuation from year to year, continues substantially as shown in my previous reports. The following table, in continuation of that contained in my report of 1912 (*Biennial Report*, 1912, p. 220) illustrates this growth and supplements that table with an additional element relating to summer session attendance. During the academic year, all graduate students recorded as such in the Registrar's office are brought under my supervision, but this is not feasible during the short summer session and many holders of a baccalaureate degree fail to report to me and are not included in the records of the Graduate School. I therefore give in the following table the

number of graduate summer session students as compiled from the Registrar's records and also from the records kept by the Dean of the Graduate School. The graduate attendance during semesters is classified with respect to the character of the studies pursued, *viz.*, Letters and Science, Engineering, Agriculture. A similar classification of summer session attendance presents some difficulties but in general its distribution does not differ greatly from that of the semester attendance. If we regard as anomalous the exceptionally small number of students registered with the Dean during the unusually hot summer of 1913, it may be inferred from the disparity between the records of the Registrar and the Dean that about one-third of the holders of baccalaureate degrees who attend the summer session have no intent of applying their work toward candidacy for a degree. While properly registered as graduate students, they are essentially transient visitors to the University.

ATTENDANCE OF GRADUATE STUDENTS

Year ending June	Semesters				Summer Session		
	L & S	Eng.	Agric.	Total	Registrar	Dean	Total
1910	224	33	24	281	328	221	471
1911	280	39	28	347	367	285	594
1912	302	26	49	377	446	326	681
1913	302	29	63	394	519	250	603
1914	334	18	85	437	689	446	802

The totals given in the last column are based upon the summer session attendance recorded in the Dean's office and are exclusive of names twice counted. The small difference existing between these totals and the sums of the summer and winter attendance shows clearly the different composition of the two bodies. Comparatively few graduate students are in attendance both summer and winter.

A striking feature of the above exhibit is the very rapid growth in the number of graduate students in agriculture. This increase is, however, only in part real and in part is due to inclusion under Agriculture of certain classes of students who in 1910 would have been otherwise classified; e. g. the new departments of plant pathology, agricultural economics, etc. bring under Agriculture students who would formerly have been classified under Letters and Science.

I also submit for your information a continuation of the table (Biennial Report, 1912, p. 221) showing the number of higher degrees conferred in course and the ratio of the number of such degrees to the total graduate enrollment. The total enrollment is for this purpose taken from the records of the Dean's office and the ratios therefore differ slightly from those hitherto based upon the Registrar's records.

Year ending June	Second Degrees		Doctor's Degrees	
	No.	Per cent.	No.	Per cent.
1910	110	23	18	4
1911	109	18	23	4
1912	139	20	28	4
1913	118	20	19	3
1914	157	20	31	4

The percentage of degrees conferred continues to show the marked constancy of value noted in my last report but both the number of degrees and the total attendance indicate that the academic year 1913 was one of growth retarded but not long checked, as is shown in the figures for the following year. A similar retardation, perhaps equally temporary, should be anticipated for the coming year in consequence of the increase of tuition fees for non-resident students from $70 to $100 per annum.

Very respectfully,

GEO. C. COMSTOCK,

Dean.

DIRECTORY OF DOCTORS OF PHILOSOPHY

President Charles R. Van Hise,
The University of Wisconsin.

Dear Sir: I submit to you herewith as a supplement to my biennial report a directory of Doctors of Philosophy of The University of Wisconsin in continuation of the directory published in your biennial report for the years 1904–6. It is impossible to make this directory complete and it must be regarded as representing only such information as is now attainable.

Very truly yours,
GEO. C. COMSTOCK,
Dean.

1907

FLORENCE E. ALLEN—Instructor in Mathematics, The University of Wisconsin, Madison.
WILLIAM B. ANDERSON—Assistant Professor of Physics, Iowa State College, Ames, Iowa.
CARL BECKER—Professor of Modern History, The University of Kansas, Lawrence.
JOHN L. CONGER—Professor of History, Knox College, Galesburg, Illinois.
CLARENCE C. CRAWFORD—Assistant Professor of History, The University of Kansas, Lawrence.
LEWIS FUSSELL—Professor of Electrical Engineering, Swarthmore College, Swarthmore, Pa.
MARTIN H. HAERTEL—Assistant Professor of German, The University of Wisconsin, Madison.
LEWIS H. HANEY—Acting Assistant Professor of Political Economy, The University of Michigan, Ann Arbor.
HENRY L. JANES—Secretary of the American Embassy, Rio de Janeiro, Brazil.
DAVID R. LEE—Professor of Latin and Greek, Central College, Fayette, Mo.
WILLIAM G. MARQUETTE—Instructor in Botany, The University of Wisconsin, Madison.
OTTO PATZER—Assistant Professor of French, University of Washington, Seattle.
RAYMOND V. PHELAN—Assistant Professor of Political Economy, The University of Minnesota, Minneapolis.

BENJAMIN M. RASTALL—Civic Secretary, Duluth, Minn.
GEORGE M. REED—Assistant Professor of Botany, The University of Missouri, Columbia.
JOSEPH SCHAFER—Professor of History, The University of Oregon, Eugene.
FREDERICK L. SHINN—Assistant Professor of Chemistry, The University of Oregon, Eugene.
ROYAL B. WAY—Professor of American History, Beloit College, Beloit, Wis.
JOHN WEINZIRL—Professor of Bacteriology, The University of Washington, Seattle.

1908

CHARLES H. AMBLER—Acting Professor of History, Randolph-Macon College, Ashland, Va.
LAWRENCE W. BURDICK—Professor of Latin and Greek, Alfred University, Alfred, N. Y.
GUY B. COLBURN—Acting Professor of Latin, Iowa College, Grinnell.
ALFRED N. COOK—Professor of Chemistry, University of South Dakota, Vermilion.
EDWARD J. FILBEY—Professor of Greek, The University of Nashville, Nashville, Tenn.
AMELIA C. FORD—Professor of History, Milwaukee-Downer College Milwaukee, Wis.
ROBERT W. HEGNER—Instructor in Zoology, The University of Michigan, Ann Arbor.
ANNA A. HELMHOLTZ (Mrs. R. V. Phelan)—Instructor in English, The University of Minnesota, Minneapolis.
CLARA P. NEWPORT—Acting Professor of German, Swarthmore College, Swarthmore, Pa.
FREDERICK W. OSWALD, Jr.—
ARTHUR R. SEYMOUR—Assistant Professor of Romance Languages, The University of Illinois, Urbana.
WARREN D. SMITH—Formerly Chief of Division of Geology and Mines, Bureau of Science, Philippine Islands. Professor of Geology, University of Oregon. Eugene.
JOHN G. THOMPSON—Assistant Professor of Political Economy, The University of Illinois, Urbana.
CHARLES A. TIBBALS—Assistant Professor of Chemistry, Armour Institute of Technology, Chicago.
JAMES E. TUTHILL—Assistant Professor of History, Kentucky State University, Lexington.
CHARLES T. VOORHIES—Professor of Biology, The University of Utah, Salt Lake City.
HENRY C. WOLFF—Assistant Professor of Mathematics, The University of Wisconsin, Madison.

1909

ALEXANDER CANCE—Instructor in Economics, Dartmouth College, Hanover, N. H.
CHARLES D. COOL—Assistant Professor of Romance Languages, The University of Wisconsin, Madison.
JOHN L. COULTER—The University of Minnesota, Mallory.
FREDERICK S. DEIBLER—Assistant Professor of Political Economy, Northwestern University, Evanston, Ill.
FRED DUNCALF—Professor of History, The University of Texas, Austin.
GLOVER D. HANCOCK—Assistant Professor of Economics, Amherst College,

RALPH H. HESS—Associate Professor of Political Economy, The University of Wisconsin.
ALONZO S. McDANIEL—Bureau of Standards, Washington, D. C.
MRS. THERESA McMAHON—Seattle, Washington.
WILLIAM F. NOTZ—Professor of Ancient Languages, Northwestern University, Watertown, Wis.
EDMUND B. SCHLATTER—Assistant Professor of Romance Languages, The University of Wisconsin.
CHARLES W. STODDART—Professor of Agricultural Chemistry, Pennsylvania State College, State College, Pa.
HELEN L. SUMNER—Bureau of Child Welfare, Washington, D. C.
WILLIBALD WENIGER—Professor of Physics, Agricultural College, Corvallis, Oregon.
EDWARD WOLESENSKY—Instructor in Chemistry, The University of Iowa, Iowa City.

1910

RUTH ALLEN—Teacher, High School, South Milwaukee.
SYDNEY H. BALL—Mining Geologist, 71 Broadway, N. Y.
R. C. BENNER—Professor of Chemistry, The University of Arizona.
CLARENCE E. BOYD—Professor of Latin and Greek, Florida State College for Women, Tallahassee, Fla.
JAMES M. BRECKINRIDGE—Instructor, Carroll College, Waukesha, Wisconsin.
THOMAS W. CRAFER—Professor of Political Science, Lawrence College.
FRANCIS T. H'DOUBLER—Student, Harvard University.
CHARLES W. HILL—Chemist, Cleveland Research Laboratory.
DAVID KLEIN—State Chemist, Springfield, Illinois.
FRANCIS E. KRAUSKOPF—Assistant Professor of Chemistry, The University of Wisconsin.
BENJAMIN F. LUTMAN—Assistant Professor of Botany, The University of Vermont.
HENRY H. P. SEVERIN—201 Wisconsin St., Milwaukee, Wis.
EDWARD STEIDTMANN—Assistant Professor of Geology, The University of Wisconsin.
EARLE M. TERRY—Assistant Professor of Physics, The University of Wisconsin.
W. J. TRIMBLE—Professor of History, Agricultural College, N. D.,
MELVIN J. WHITE—Professor of History, Tulane University.
WENDELL G. WILCOX—Consulting Chemist, Cleveland, Ohio.

1911

FRANCES BERKELEY—Mrs. Karl Young, Madison, Wisconsin.
JOSEPH BRANDT—Assistant Professor of Latin, The University of Wisconsin.
FRIEDRICH BRUNS—Assistant Professor of German, The University of Wisconsin.
WILLIAM COLLINS—Victoria Memorial Museum, Ottawa, Canada.
GUY H. COX—Instructor, School of Mines, Rolla, Missouri.
JAMES N. CURRIE—Chemist, Storrs Station, Connecticut.
PAUL H. DIKE—Instructor in Chemistry, The University of Missouri, Columbia, Missouri.
WILLIAM FORSYTHE—Physicist, General Electric Company, Cleveland.
CHARLES GATES—Instructor, Milwaukee Normal School, Wisconsin.
LEWIS C. GRAY—Professor of Political Economy, The University of Saskatchewan.
HAROLD HASTINGS—Professor of Ancient Languages, Hamilton College.

ALCAN HIRSCH—Chemical Engineer, 601 W. 115th St., New York City.
ARDEN JOHNSON—Chemical Engineer, Madison, Wisconsin.
CHARLES T. KIRK—Assistant Professor of Geology, The University of New Mexico, Albuquerque.
JESSE T. LITTLETON—Physicist, Corning Glass Works, Corning, N. Y.
FREDERICK MANCHESTER—Instructor in English, The University of Wisconsin.
FREDERICK McALLISTER—Instructor in Botany, The University of Texas.
MAX C. OTTO—Assistant Professor of Philosophy, The University of Wisconsin.
BERNADOTTE SCHMITT—Instructor in History, Western Reserve University, Cleveland, Ohio.
RICHARD SCHOLZ—Assistant Professor of History, The University of California.
LEON I. SHAW—Instructor in Chemistry, Northwestern University, Evanston, Illinois.
JOSEPH D. TRUEMAN—Deceased.
AUGUST W. WEBER—Instructor, Normal Training School, Cleveland, Ohio.

1912

MARTIN ANGELL—No address.
FREDA M. BACHMANN—Assistant Professor of Botany, Milwaukee-Downer College.
OSCAR BARNEBEY—Instructor in Chemistry, The University of Wisconsin.
FREDERICK CUNNINGHAM—Engineer, General Electric Company, Harrison, N. J.
HORACE GROVE DEMING, Los Lanos, Laguna, Philippine Islands.
MELVIN E. DIEMER—Chemist, Forest Products Laboratory, Madison.
EMIL O. ELLINGSON—Instructor in Chemistry, The University of Wisconsin.
JAMES A. ESTEY—Professor of Political Economy, Purdue University.
ROBERT HARVIE—Geologist, Geological Survey, Ottawa, Canada.
JOHN HILL—Instructor in Oshkosh State Normal School, Wisconsin.
EARNEST A. HOOTON—Harvard University.
STANLEY K. HORNBECK—Assistant Professor of Political Science, The University of Wisconsin.
WINFIELD S. HUBBARD—Chemist, Government Service, Washington, D. C.
AXEL JOHNSON—Social Worker, Alta Vista, Kansas.
HELEN M. JOHNSON—Chickasha, Oklahoma.
ALFRED L. KOENIG—Instructor in Chemistry, The University of Wisconsin.
JAMES N. LAWRENCE—Chemical Engineer, Buffalo, N. Y.
GEORGE V. McCAULEY—Instructor, Northwestern University, 806 Main Street, Evanston.
WARNER J. MORSE—Maine Agricultural Experiment Station, Orono, Me.
ROBERT MICHELL—Assistant Professor of Romance Languages, The University of Wisconsin.
CARL F. NELSON—Instructor in Chemistry, The University of Illinois.
LAWRENCE M. PRICE—Instructor in German, The University of Missouri, Columbia, Mo.
HORACE SECRIST—Assistant Professor of Political Economy, Northwestern University, Evanston, Ill.
GEORGE W. STEPHENS—Professor of Political Economy, The University of Maine.

PAUL E. TITSWORTH—Professor of Languages, Alfred University.
BENJAMIN B. WALLACE—Assistant Professor of Political Science, Northwestern University, Evanston, Ill.
ALLEN B. WEST—Professor of Greek, Swarthmore College.

1913

ALBERT W. ARON—Instructor in German, The University of Wisconsin.
ROBERT BROOKS—Instructor in History, The University of Georgia.
WILLIAM A. COOK—Assistant Professor of Education, The University of Colorado.
ROY CURTIS—Director, School of Commerce, The University of Georgia.
ULYSSES G. DUBACH—No address.
ADOLPHINE B. ERNST—Instructor in German, Extension Division, The University of Wisconsin.
THOMAS L. HARRIS—Assistant Professor of Economics, Carlton College.
WILLFORD I. KING—Instructor in Political Economy, The University of Wisconsin.
SELDEN G. LOWRIE—Assistant Professor of Political Science, The University of Cincinnati.
IRVING E. MELHUS—Plant Pathologist, Bureau of Plant Industry, Washington, D. C.
WILLIAM H. PETERSON—Instructor in Chemistry, The University of Wisconsin.
ROY L. PRIMM—Assistant in Agricultural Bacteriology, The University of Wisconsin.
CHARLES M. PURIN—Assistant Professor of German, The University of Wisconsin.
WALTER E. ROLOFF—Seattle, Washington.
JONATHAN F. SCOTT—Assistant Professor of History, The University of Michigan.
LUCRETIA SIMMONS—Assistant Professor of German, Milwaukee-Downer.
NELLIE A. WAKEMAN—Instructor in Pharmacy, The University of Wisconsin.
JERRY E. WODSEDALEK—Professor and Head of Department of Zoology, The University of Idaho, Moscow, Idaho.
CHARLES E. YOUNG—Instructor in Romance Languages, Beloit College.

1914.

ISAAC ASH—Professor of Education, Ohio University, Athens.
ROSS A. BAKER—Instructor in Chemistry, The University of Minnesota.
ELBERT T. BARTHOLOMEW—Instructor in Botany, The University of Wisconsin.
RAYMOND T. BIRGE—Instructor in Physics, Syracuse University.
JOHN M. BRIDGHAM—State Normal, La Crosse.
RALPH H. CARR—Instructor in Agricultural Chemistry, Purdue University, Lafayette, Indiana.
WILLIAM W. CARSON—Professor of History, Morningside College, Sioux City, Iowa.
JAMES L. CATTELL—Assistant Professor of Romance Languages, The University of Wisconsin.
H. A. CURTIS—Instructor in Chemistry, The University of Colorado.
L. P. DEVRIES—Instructor in Romance Languages, Leland Stanford Junior University.

GERHARDT DIETRICHSON—Instructor in Chemistry, The University of Minnesota.
EZEKIEL DOWNEY—Statistician, Industrial Commission, Madison.
HOWARD A. EDSON—U. S. Bureau of Plant Pathology, Washington.
JOHN I. FALCONER—Assistant Professor of Agricultural Economics, Ohio State University.
JOSEPH S. GALLAND—Assistant Professor of Romance Languages, The University of Wisconsin.
EDWARD M. GILBERT—Assistant Professor of Botany, The University of Wisconsin.
GRACE GOODRICH—Ripon.
HARRY E. HEEREN—Professor of Political Science, Cambridge University, 303 Craigo Hall, Cambridge, Mass.
MARTIN P. HENDERSON—Pathologist, Oregon Experiment Station, Medford, Oregon.
AARON JOHNSON—Instructor in Plant Pathology, The University of Wisconsin.
GEORGE W. KEITT—Instructor in Plant Pathology, The University of Wisconsin.
WILLIAM J. KELLER—Instructor in German, The University of Wisconsin.
ORREN LLOYD-JONES—Assistant Professon of Animal Husbandry, Iowa State College, Ames, Iowa.
CLIFFORD C. MELOCHE—Assistant in Chemistry, The University of Wisconsin.
PAUL H. MILLER—Assistant Professor of Romance Languages, The University of Wisconsin.
PAUL H. NEYSTROM—Assistant Professor of Political Economy, The University of Minnesota.
HEINRICH W. NORDMEYER—Assistant Professor of German, Ohio State University.
GILBERT M. SMITH—Instructor in Botany, The University of Wisconsin.
CHESTER SNOW—Teacher, Moscow, Idaho.
RAYMOND T. ZILLMER—Instructor in Political Science, The University of Wisconsin.
OTTO J. ZOBEL—Instructor in Physics, The University of Wisconsin.

REPORT OF THE DIRECTOR OF WASHBURN OBSERVATORY

President Charles R. Van Hise,
The University of Wisconsin.

Dear Sir: I submit to you herewith my report as Director of the Washburn Observatory for the biennial period ending June 30, 1914.

From its foundation, in 1879, the Washburn Observatory has been regarded primarily as an institution for astronomical research and, in fulfillment of this purpose, it has been my plan to concentrate its work upon large problems requiring for their solution protracted effort along lines carefully determined in advance. The last two years, therefore, have been devoted to a continuation of work whose earlier stages are set forth in my former reports. The two chief instruments of the Observatory are assigned, the meridian circle to Astronomer Flint, the 40 cm. equatorial telescope to the director. The smaller equatorial telescope and the transit instrument are given mainly to student use since the limited staff of the Observatory does not suffice for their systematic employment upon research problems. These smaller instruments, however, together with other minor apparatus, constitute a valuable auxiliary to instruction in astronomy and have been used to a considerable extent by advanced students.

My personal research work has been given largely to a determination of the proper motions of faint telescopic stars through micrometric comparison of their positions with those of brighter neighboring stars of known motion. This field was practically unworked when I entered it a decade ago, but the work done here is now attracting to it a considerable measure of attention elsewhere. My provisional results have from time to time been published in various astronomical periodicals and in Volume XII of the *Publications of the Washburn Observatory*. Their

most complete exposition is to be found in No. 655 of the *Astronomical Journal* issued since the date of my last report, from which I quote with verbal modification the following summary of results thus far attained.

"1. It has been customary to assume that the fainter stars have no sensible motions but, out of 500 telescopic stars included between the seventh and thirteenth magnitudes, that have been here investigated, approximately seventy-five per cent yield sensible proper motions.

"2. The proper motions are referred to the system of Boss's *Preliminary General Catalogue* and possess a precision but little inferior to those of the fainter stars of that catalogue.

"3. These proper motions confirm and extend from the lucid stars at least to the twelfth magnitude the relation, that in the mean the amount of proper motion is inversely proportional to stellar magnitude. When seven per cent of the proper motions are rejected as abnormally great, the relation assumes the form, mean proper motion multiplied by magnitude equals 35″ per century.

"4. The frequency law of distribution of the individual products is such that the value most frequently occurring is 15″ but one-half of all values of the product are greater than 35″. For both lucid and telescopic stars, seven per cent of the values exceed 120″ per century.

"5. The values of the proper motions show a marked dependence upon position with respect to the galaxy. The lucid and the telescopic stars agree in making the mean proper motion in high galactic latitudes about twice as great as in the milky way.

"6. The telescopic stars here discussed furnish two determinations of the apex of solar motion, one from stars fainter than, the other from stars brighter than the tenth magnitude. These determinations are in substantial agreement with the results furnished by brighter stars when account is taken of a progressive shift in the galactic longitude of the apex, indicated by the bright stars.

"7. The sun's linear velocity relative to the telescopic stars is substantially the same as its velocity relative to the lucid stars.

"8. The stars between the seventh and thirteenth magnitudes share in the drift or preferential direction of motion found for the brighter stars and have approximately the same line of motion (vertex).

"9. The numerical amount of preference for this direction of motion is substantially the same for bright and faint stars.

"10. The lucid and telescopic stars have approximately equal components of motion perpendicular to the line of drift. They have also equal components of motion parallel to the line of drift.

"11. The linear velocity of stellar motions is substantially independent of stellar magnitude.

"12. The faint stars and bright stars are parts of one and the same stellar system and are in great measure intermingled, the faint stars being less remote than has been inferred from photometric considerations."

These results may serve to illustrate the purpose and partial outcome of the investigations in hand, but they are not to be interpreted as marking its conclusion. It is my intent to continue this work along similar lines for some years to come.

Parallel with the above work, I have carried on a series of observations of binary stars, commenced many years ago. Included in this list are the major part of all known stars which show any considerable effect of attraction one for another. The exact nature of the motion produced by these attractions, while known in general terms, presents in detail problems of high scientific interest which can be investigated only through the data furnished by painstaking observation of these stars made with a fairly large telescope. The value of such observations is greatly enhanced when they constitute a prolonged series made by the same person with the same instrument and under similar conditions. It is therefore my purpose to continue these observations so long as my connection with the Observatory endures and to make them approach as nearly as possible to the ideal condition, in which the observations made by a single observer shall cover the entire period of the revolutions of the stars in their orbit.

It seems proper also to state in this connection that a certain portion of my time and strength has been given to matters connected with the administration of scientific societies of national character, e. g., as chairman of the Committee on Astronomy of the National Academy of Sciences and as vice-president and chairman of the Committee on Comets of the Astronomical and Astrophysical Society of America. I may also note my election, during the period covered by this report, to membership in the American Academy of Arts and Sciences.

During the past two years Astronomer Flint has devoted a large amount of time to the further discussion and study of his observations for determining the distances of the nearer fixed stars. The observations are in themselves so delicate and difficult that it is only through the most minute precaution that the integrity of their results can be assured. Although provisional results of these observations have been published in the *Astronomical Journal,* their definite presentation is still to be made through a future volume of the *Observatory Publications,* to which these studies are a preliminary. During the period covered by this report, Mr. Flint has commenced using the meridian circle for the accurate determination of the positions of a selected list of about 3000 telescopic stars for which accurate modern observations are needed to determine their proper motions. Much efficient assistance in the routine parts of this work has been rendered by the Observatory clerk, Miss Edna Hill. Progress in the work above outlined has been greatly delayed through difficulties encountered in the use of a new printing chronograph. This instrument should greatly diminish the time and labor required for the observations in question, by furnishing a mechanical substitute for a considerable part of the astronomer's work. The apparatus has, however, proved very refractory and it was only after much effort and much assistance kindly furnished by the Departments of Physics and Electrical Engineering that it has recently been brought into fairly satisfactory condition. The standard sidereal clock of the Observatory has also been a source of annoyance and suspicion in connection with this work. It is thirty years old, is somewhat worn in its essential parts and is at present under investigation to determine whether it may still be considered serviceable or whether it needs to be replaced by a new and better instrument.

In accordance with established practice, the large telescope of the Observatory has been devoted to the use of visitors upon the first and third Wednesday evenings of each month, weather permitting. The Observatory is then thrown open to all visitors who choose to come, look at the heavens through the telescope and listen to the explanations given by the astronomer in charge. I estimate that from 2000 to 3000 persons avail themselves of this privilege each year.

The University time service has been maintained from the Observatory and has been materially increased through the demands

made upon it by the new buildings. The installation of this additional service as well as the current operation of the system has been carried on under my supervision by the observatory janitor in addition to his ordinary duties.

All buildings and instruments pertaining to the Observatory have been maintained in good condition during the period covered by this report and two notable betterments have been made, *viz.*, the connection of the buildings with the central heating station, as requested in my last report, and the substitution of a properly insulated system of electric wiring for the antiquated and hazardous electric light connections formerly in use. The only material addition to the buildings, beyond ordinary repairs, now required relates to fire protection which is still inadequate. I renew my former recommendation for increased protection of this kind.

Very respectfully,

GEO. C. COMSTOCK,

Director.

REPORT OF THE DIRECTOR OF PHYSICAL EDUCATION

President Charles R. Van Hise,
The University of Wisconsin.

Dear Sir: I herewith submit my report as Director of the Department of Physical Education for the biennium closing June 30, 1914.

The report for the previous biennium chronicled the reorganization, outlined the new plans, and presented the salient needs of the department.

This report is in two parts. Part I reviews briefly the progress and status of various phases of the department and its activities. In Part II detailed consideration is given to certain departmental and University policies relating to the physical education of the general student body and to the impossibility of carrying some of these policies into effect without a radical change of conditions.

PART I—PROGRESS

Changes in the Staff

While the staff is essentially the same as at the beginning of the biennium, certain important changes and additions have been made that should be noted.

Professor Clark W. Hetherington, who was a lecturer on part time from 1911, was appointed Professor of Physical Education in 1913, in charge of certain academic courses and research in physical education and play.

Assistant Professor John W. Wilce, Manager of Athletics from 1911 to 1913, resigned to become Professor of Physical Educa-

tion and Director of Football and Intra-mural Athletics at Ohio State University. He was succeeded by Mr. W. D. Richardson with the title of Assistant to the Director.

Mr. Chas. H. Wilson, Track coach, resigned August, 1912, and was succeeded by Mr. Thos. E. Jones, who came from the University of Missouri, January, 1913.

Mr. Chauncey Hyatt, Instructor and Coach of Swimming and Aquatic Sports, resigned in 1913 to became Assistant Director of Physical Education in New Trier Township High School. He was succeeded by Mr. Harry H. Hindman.

Assistant Professor Abby S. Mayhew, Director of the Women's Gymnasium, resigned in 1912, and, representing the Young Women's Christian Association, went to China to promote the physical education of Chinese girls and women. She was succeeded by Assistant Professor Blanche M. Trilling, formerly Associate Director of Physical Education in the Chicago Teachers' College.

Dr. Alice Hopkins resigned in 1914 and is succeeded by Dr. Margaret L. Johnson, Assistant Professor of Physical Education, formerly Professor and Director of Physical Education for women in the University of Kansas.

The reorganization of the staff in the Women's Division was completed in 1913 by the addition of three professionally trained instructors, Leslie B. Sawtelle (A. B. Wellesley), Henrietta L. Brown (A. B. Vassar), Mary Alice Brownell (Wellesley).

Women's Division

The past two years have been marked by the completion of the departmental reorganization of the Women's Division. The activities of the women are now conducted with most satisfactory results under the conditions, out-of-doors during the fall and spring in harmony with the plans outlined in the report of the previous biennium.

The entire plant in Lathrop Hall is now open day and night except Saturday. There is no student demand for Saturday. Previous to 1912 the plant was open only four days each week.

As noted in the previous report, a larger percentage of women than of men students is below par physically. Decided advance has been made in the provision of sports which can be engaged in freely by these less vigorous young women with advantage

and without danger. Archery and quoits, with several team games less strenuous than basketball, are helping to solve this problem. Track and field events and fencing have been added for the Class A women.

Further indoor activities will become possible with the equipment of the space formely used by the Department of Home Economics.

The fullest use of the swimming pool waits on the provision of adequate dressing and shower facilities.

An important development during the year 1913–14 was the inauguration of a series of lectures on hygiene given by Dr. Hopkins of the department staff and Dr. Morris of the Medical Adviser's staff. It is planned to enlarge this during the coming biennium. It is hoped that this may eventually develop into a semester course with academic credit, and be required of all freshmen. At present it can be conducted only at the expense of time that should be devoted to physical exercise.

The following data from the report of the Director of the Women's Gymnasium indicates the scope of the activities:

		1913–14
Number of students enrolled.		
Freshmen and sophomores	495	
Upperclassmen	247	742
Enrollment in swimming		517
bowling		237
basketball		108
dancing		267
corrective gymnastics		118
"light" exercise		83
general games		93
fencing		41
hockey		181
tennis		317
baseball		119
archery		206
track and field		25

Comparative data are unavailable because of the uncertainty of the statistics previous to 1913–14.

These records show 247 upperclassmen enrolled. Approximately 200 of these are voluntary and in excess of the requirement. The total enrollment of 742 is 65 per cent of the entire number of undergraduate women registered in 1913–14 in the University. Two hundred and six of these 742 are prohibited from any form of competitive sports.

Men's Division

The report for the previous biennium called attention to the changes and alterations in the men's gymnasium from which

improved sanitary conditions were expected. In 1910–11, 6 per cent of all the cases receiving attention at the office of the Medical Adviser had their origin in "gymnasium infections." In 1913–14, this record was reduced to *two-fifths of one per cent.*

Further improvement is expected from the transfer of all military drill to the morning hours and of physical education to the afternoon. The installation of a new and powerful vacuum cleaner permits the thorough cleansing of the drill floor between the morning and afternoon schedules.

The swimming pool presents another sanitary problem which is again emphasized in the report of the Director of the men's gymnasium. Under his supervision, the pool has been treated regularly with calcium hypochlorite which renders the water perfectly safe so far as pathogenic germs are concerned. However, the water, which is drawn from the lake, has so much organic matter that it is frequently very unsightly and of foul odor. This has been so bad at times that it was necessary to dismiss scheduled swimming classes.

Data presented by the heating engineer show that a re-filtration system can be installed that will reduce the pumping and heating expense sufficiently to pay for the entire improvment in 5 years. Such a system will ensure absolutely clear water and establish swimming as a popular form of exercise with upper classmen who will not use the pool as it is. Swimming indoors is largely confined to freshmen and sophomores at present. This improvement is most earnestly recommended. It can be done for $1,350 and will effect an annual saving of $280 or more.

A constant source of interference with the efficiency of the department has been the long standing practice of having military drill at 3:30 and 4:30 o'clock. This has engaged large numbers of students at the only hours otherwise available for voluntary exercise. It also necessitated the holding of physical education classes in the morning. Developments in the military department in the year 1913–14 looked to the further use of the gymnasium during the afternoon with consequent curtailment of the activities of this department.

The Director of the men's gymnasium suggested that he could organize all required activities in the afternoon without loss if military drill were transferred to the morning. With the approval of the Commandant and after conference with the sched-

ule committees of the various colleges, the University faculty approved the necessary changes in the rules which permitted the two departments concerned to make the desired arrangement. Within the limits of our facilities and time (two periods of thirty minutes each of actual exercise per week) the new plan will make for distinct improvement in the results of the prescribed activities.

The organization of a leaders corps of seventy-five students provides a large body of trained assistants, materially enlarging the efficiency of the regular staff.

The following data from the report of the Director of the men's gymnasium indicates the scope and variety of the activities provided for the satisfaction of the freshman and sophomore requirement and the extent of the enrollment of both classes:

1913-1914 ENROLLMENT—FRESHMEN AND SOPHOMORES—Men.

Activity	First semester Fall season		Second semester Winter season	
	Freshmen	Sophomores	Freshmen	Sophomores
General class	605	61	415	117
Leaders corps	50	20	50	25
Gymnastics—Adv.	10	25	25	10
Gymnastics—Team	.....	.....	.....	25
Track—Class	79	35	123	72
Track—Team	.....	13	.....	29
Football	52	45	.....	.....
Football—'Varsity	.....	21	.....	.....
Soccer	21	39	.....	.....
Basketball	40	.....	28	58
Basketball—'Varsity	.....	16	.....	21
Swimming	25	227	137	18
Swimming—'Varsity	.....	9	.....	3
Rowing	35	30	25	21
Rowing—'Varsity	.....	.....	20	9
Baseball—'Varsity	.....	.....	.....	20
Boxing	.....	.....	.....	44
Wrestling	.....	.....	.....	16
Corrective	108	52	103	76
Totals	1,025	593	929	564
Duplications	.....	61	.....	.....
	1,025	532	929	564

	First semester		Second semester	
Summary—				
Freshmen	1,025		929	
Sophomores	532		564	
		1,557		1,493
Upper class (making up)		41		48
Agric. short course		432		238
Dairy students		100		.....
		2,130		1,779

A working agreement with the Military Department provides that sophomores who are officers in the regiment may substitute an extra year of military drill for their sophomore physical education. During 1913–14, 29 students took advantage of this in the first semester, and 34 in the second.

Intramural sports

The participation of students in physical activities other than those in fulfilment of freshman and sophomore requirements and intercollegiate athletics, cannot be indicated with any degree of exactness, as there is no practical method of securing the necessary data. There is no question that it is all that the capacity of the available facilities permits. A discussion of this factor is given in Part II of this report.

The organized activities of the women include the following sports and tournaments:

Fall—Hockey, Tennis, Volley Ball, Newcomb, and Archery.

Winter—Bowling, Basketball, Swimming, and Fencing.

Spring—Archery, Baseball, Tennis, Track, and Field.

Other sports will be organized as facilities are provided and interest is developed.

The organized voluntary activities of the men include tournaments and contests in the following sports:

Fall—Cross Country, Track and Field, Football and Soccer.

Winter—Basketball, Swimming, Track and Field, Wrestling, Fencing, Handball, and Gymnastics.

Spring—Baseball, (4 leagues—36 teams), Track and Field, Tennis, Rowing, and Canoeing.

The number of different men in contests and tournments or on squads training for these events *exclusive of intercollegiate,* was approximately as follows:

Fall	264
Winter	463
Spring	835

Allowing for duplications, it is estimated that over 1000 different men participated in voluntary competitive sports. These are exclusive of members of 'varsity teams.

Financing of Intramural Sports continues to be a problem because there is no fixed source of revenue that can be depended

upon. All moneys spent upon these sports and the associated activities—the annual Alumni Homecoming in the Fall and the Spring Festival—come from the sale of buttons, admission receipts of the various events, and the circus.

The Student Athletic Board, the Department and the Athletic Council are studying this question and hope to solve it during the coming year.

The status of the interclass Athletic Fund, of which the Director of Physical Education is the custodian and the Athletic Board the directors, is as follows:

STATEMENT INTERCLASS ATHLETIC FUND

1912-13

Balance 1911-12		$501.86	
Receipts—			
Circus	$1,251.87		
Festival	1,579.10		
Homecoming	335.50		
Track	359.65		
Rowing	285.00		
Miscellaneous	103.05		
		3,914.17	
			$4,416.03
Expenses—			
Festival	$2,284.85		
Homecoming	221.36		
Track	350.48		
Rowing	377.63		
Football	581.43		
Basketball	135.61		
Baseball	231.30		
Miscellaneous	430.17		
			4,612.83
Bills payable			$196.80
1913-14			
Receipts—			
Festival	$369.15		
Homecoming	234.76		
Football	284.82		
Track	181.50		
Miscellaneous	10.25		
			$1,080.48
Expenses—			
Festival	$477.73		
Homecoming	293.12		
Football	306.66		
Track	141.84		
Miscellaneous	74.51		
		$1,293.86	
1912-13		196.80	
			1,490.66
Bills payable			$410.18

INTERCOLLEGIATE ATHLETICS

Intercollegiate athletics continue to hold a prominent place, and, because of their spectacular nature, are considered by many to be the chief feature and to constitute the largest part of the department's activities. Because of confusing the functions of

intercollegiate and intramural athletics these two groups of activity are frequently contrasted and set off against each other to the disadvantage of the former.

Intercollegiate athletics do not necessarily prevent or interfere with the development of intramural activities. Properly conducted the reverse is the case.

The development of intramural athletics depends, among other things, upon the amount and conveniences of the available space and the time at the students' disposal. The space requirement for the various sports is essentially the same per game and per person in both intercollegiate and intramural schemes. Part II of this report will show that the available facilities are now used to their limit. No increase of the number of students in the various sports could be secured in any such number as to make up for the definite loss that would be caused by the elimination of intercollegiate athletics. Intramural sports would cost less money but would not bring in the amount necessary to maintain them without the University appropriations.

Participants. During the two years just closed the net number of students participating in intercollegiate sports has been as follows:

Sport	1912–1913	1913–1914
Cross country	22	26
Football	48	47
Track and field	64	59
Basketball	36	28
Baseball	38	50
Rowing	42	42
Gymnastics	15	27
Swimming	22	20
Wrestling	9	8
Fencing	12	12
Tennis	9	10
Total	317	329
Duplications	40	45
Net	277	284

The numbers above do not include freshmen nor many who turned out at the beginning of the season but found themselves unfitted to reach the requisite standard to continue with the squad or were ineligible on account of scholarship. These unrecorded men continue to follow their selected sport when there are sufficient space and instructors to accommodate them in the intramural scheme.

Games Won and Lost. The results of the various contests

were sufficiently successful to encourage the belief that a higher degree of efficiency has been reached than prevailed in previous seasons.

GAMES WON AND LOST

Sport	1912–1913		1913–1914	
	Won	Lost	Won	Lost
Baseball	5	7	7	5
Cross country	1		2	
Football	7		3	3
Track	3	1	2	3
Rowing	1	3		2
Basketball	14	1	15	
Gymnastics	2		1	1
Swimming	2	2		4
Fencing		1		1
Wrestling		2	1	1
Total	35	17	31	20

Conference championships were won during the biennium as follows:

1912–1913—Basketball, Cross Country, Football, Gymnastics, Indoor Track and Field.

1913–1914—Basketball and Cross Country.

The basketball team has the remarkable record of losing in three seasons but one game out of forty-five played.

Two events during the biennium require special consideration.

Rowing. In the spring of 1914 the Executive Committee of the Board of Regents requested of the Athletic Council a report on the effect of rowing on the health of students. On the request of the Council the Medical Adviser submitted a report covering the period 1910–1913. This report was submitted to the Medical Faculty for interpretation and recommendation and on the basis of these several actions the Council on June 23, 1914, "voted that the action of the Medical Faculty be presented to the University Faculty with the following recommendation:

"The Athletic Council recommends that participation in intercollegiate rowing contests by University of Wisconsin crews be temporarily discontinued, pending the further development of intramural aquatic sports."

While final action was taken subsequent to the close of the biennial period covered by this report, it seems wise to incorporate here the report submitted to the University Faculty and adopted by them on September 28, 1914, and, on October 14, 1914, approved by the Board of Regents.

Freshman Crews—1911 to 1913, Inclusive

Class	Total	Records	Cardiac Hypertrophy			Dilation	Duplicate in 'Varsity list. Later 'Varsity candidates
			Before	After	Numeral Men		
1914	34	31	2	10	6	0	6
1915	14	14	2	8	6	0	10
1916	11	11	2	10	7	0	7
Total (Different Individuals)	59	56	6	28	19	0	23

Subsequent changes in Men Continuing Rowing after Freshman Year. (Unrecorded under data for year.)

Class	Total	Hypertrophy Numeral Men	Total	Dilation Numeral Men
1914	5	2	2	2
1915	0	0	0	0
1916	1	1	1	1
.....	.....	.....	.....	.....

Varsity Crew—1911 to 1914, Inclusive

Year	Total	Records	Cardiac Hypertrophy			Dilation	Duplication Freshmen or previous 'Varsity candidates
			Before	After	"W" Men		
1911	26	26	1	6	5	0	.....
1912	10	10	4	9	7	0	7
1913	14	14	10	13	11	1	13
1914	21	21	15	(15)?	7	1	17
Total (Duplicates where more than one year crew)	71	71	30	(43)?	30	2	37
Total Individual	56	56	7	40	.....	.....	.....
Total W. Men	23	23	4	20	.....	.....	.....

(? 1914 season not complete)

Subsequent Changes in Men in Succeeding Rowing Seasons.* (Not Recorded with Data of Year.) Previous changes noted.

Year	Hypertrophy		Dilation		Hypertrophy	
	Total	"W" Men	Total	"W" Men	Total	"W" Men
1911	0	0	3	2	.....	.....
1912	1	1	2	2	4	4
1913	0	0	1	1	10	10
1914	.....	.....	.....	.....	15	7
.....	.....	.....	.....	.....	.....	.....

Note:—These additional data are soplaced as to show at a glance the ultimate changes of the crew of each year by the addition of these figures to those of the year. For example, taking the 1914 crew (Freshman): At end of Freshman season 10 men of squad (34), 6 of these numeral men had hypertrophy: on continuance of rowing 5 more of squad, 2 of them numeral men in 1914, making total of 15 of 1914 squad and 8 of the numeral men, developed hypertrophy.

REPORT TO UNIVERSITY FACULTY ON INTERCOLLEGIATE ROWING

"The effect of training for and participation in intercollegiate rowing races was discussed during the past year by the Regents, the Athletic Council, and the Department of Clinical Medicine, and in April the Athletic Council was requested by the Executive Committee of the Regents to prepare a report upon the question.

"The Department of Clinical Medicine on request of the Council prepared statistics from its records, which may be summarized as follows:

" 'Of 59 candidates for Freshman crews in the years 1910–1913, there are medical records of 56 men. Of these 6 had cardiac hypertrophy before beginning rowing. During one season's training this was increased by 22 men, making a total of 28 Freshman oarsmen with heart hypertrophy. The records of the 'Varsity crew candidates are essentially subsequent histories of these men as the 'Varsity is almost completely recruited from Freshman crews. These crew records show that of a total of 56 men training for the crews—7 had cardiac hypertrophy before beginning training, and 33 acquired the condition as a result of such training. Included in this list are 23 "W" men, of whom 4 had hypertrophy before making the crew, and 16 developed it, giving a total of 20 out of 23 "W" men.'

"In response to a request to the Medical Faculty the following interpretation of these statistics was received:

" 'The Faculty of the Medical School believe that the data presented by the Clinical Department showed couclusively that the severe training deemed necessary for preparing crews for intercollegiate contests puts so severe a strain on the heart that an undue proportion of men are seriously injured, and that, therefore, a continuation of intercollegiate rowing is indefensible from the health standpoint.'

"The Athletic Council recommends that participation in intercollegiate rowing contests by University of Wisconsin crews be temporarily discontinued, pending the further development of intramural aquatic sports."

Omitted through oversight from this statement is the graver medical fact that 3, or 15 per cent, of the hypertrophies among "W" men had resulted in acute dilation, seriously affecting the

immediate health of the men concerned. The detailed report of the Medical Adviser is submitted herewith.

It is believed that the elimination of the freshman crew and extending the period of preparation of a 'varsity crew to two or three years, may prove the solution of the problem in which the chief factors are, first—crew material with no previous experience of a sort that would give proper heart training during the growing and developing period, and second—too short a season on the water in which to develop the requisite technique or watermanship, this necessitating more rowing than such material could endure without danger.

Camp Randall. In the biennial report of 1912 it was stated that "the equipment at Camp Randall is rapidly deteriorating and probably cannot be maintained beyond 1915 without further large expenditures."

In May, 1914, an inspection of the north stand at Camp Randall by the University Architect and the Consulting Engineer, disclosed such a dangerous condition that the stand was condemned and dismantled.

Thus was precipitated without warning a situation that was not expected to develop seriously before another year. A temporary solution has been found by renting portable bleachers at a cost for the football season of $2000, (25 cents per seat), but this policy cannot be continued for any length of time. It is unsatisfactory from nearly every point of view.

The bleachers are of the "circus" type and entirely safe, but do not have the appearance of safety nor of comfort, and in finish are most unattractive. Being entirely open beneath the seats except for footrests, they afford no protection on cold, windy days.

They are exceedingly uneconomical from the standpoint of income. Having only twenty rows of seats in order to keep within the margin of safety in height, and the bottom rows being too near the ground to permit a good view of the field, the number of seats in any section is so small that in order to secure a capacity equivalent to the old stand the structure must be extended nearly one hundred feet beyond the goal lines where seats are unsalable except when the demand is extraordinary.

From the standpoint of investment alone it will be unwise

to continue the present policy for longer than is necessary to establish the 'varsity fields in their permanent location and to convert the present ground to intramural purposes.

A plain reinforced concrete stand can be built on sloping ground for approximately $3.00 per seat and with little or no expense for maintenance. The capacity of the grand stand, south bleachers and north bleachers was about 8,200. A 10,000 capacity stand would cost about $30,000. Rental at 25 cents per seat is 8 per cent of the cost of a permanent structure. An investment of $2,500 per annum would extinguish a $30,000 loan at 5 per cent in less than twenty years and then the University would have an indestructible equipment. Wherever permanent stands of this nature have replaced wooden structures, attendance has immediately shown a marked increase. I would earnestly recommend serious consideration at an early date of this suggestion with a view to determining a legal and practical method of securing the necessary funds.

This situation also serves to emphasize a subject given prominence in both my preceding reports, namely, the adoption of a definite plan for the development of the department's permanent facilities.

Two years ago was noted the action of the Board of Regents in approval of a plan of development in harmony with the Laird and Cret scheme in the fields west of Observatory Hill now occupied by the College of Agriculture. During 1913 that action was rescinded when it appeared that the proposed plan would be destructive of many of the interests of the College of Agriculture. This department was fully in accord with this change and then proposed an alternative plan which from the standpoint of convenience of the student body as at present located, and with increasing convenience for many years to come, is superior to the former plan.

It was proposed, and the Board of Regents has approved, that Camp Randall's thirty-three acres, outside Memorial Park, shall be the permanent location of the 'varsity and intramural fields and of any new buildings erected for this department, and that additional fields shall be constructed in the immediate vicinity of the Men's Dormitories when these are built on the shores of University Bay.

In view of the present situation at Camp Randall as dis-

cussed above, and because of the conditions set forth in Part II of this report, I would earnestly recommend the adoption of a plan and the securing of ways and means to begin the proposed development early in 1915, at least to the extent of doing the necessary grading, drainage, and seeding, so that proper playing surfaces may be prepared at the earliest possible date.

Receipts and Expenses. A statement of the receipts and expenses of the Athletic Council for the biennium shows that the athletic activities have carried themselves during the past two years, with a net profit of $7,430.73. The University has received $6,000 of this profit on account of the Athletic Annex and the balance has been applied on the deficit caused by the large sums required for improvements and repairs in 1911–1912 (over $13,000) and the Athletic Bulletin which ran behind $2,600 in 1912-13 and was discontinued at the end of that year.

STATEMENT OF ATHLETIC COUNCIL

1912–1913

Net deficit—July 1, 1912			$7,569.68
Games, Interest, etc.			
Income	$46,617.05		
Expenses	42,341.04		
Profit		$4,276.01	
Athletic Bulletin			
*Income	$1,514.27		
Expenses	4,546.99		
Cash deficit	$3,032.72		
Athletic Annex			
(Note to University)	3,000.00		
		6,032.72	
Net deficit on year			1,756.61
Total deficit June 30, 1913			$9,326.39

1913–1914

Games, etc.			
Income	$44,364.10		
Expenses	41,209.38		
Profit	$3,154.72		
Athletic Bulletin—Account 1912–13			
Income	$539.70		
Expenses	155.27		
Profit	384.43		
		$3,539.15	
Athletic Annex (note to University)		3,000.00	
Net profit for year			539.15
Deficit June 30, 1914			$8,787.24

* Does not include bills receivable.

PROFESSIONAL COURSES

The professional courses established in 1911 for the training of physical educators, play leaders, and recreation directors appear to have justified themselves judging from the enrollment and results to graduates. The registration has been as follows:

	1911–12	1912–13	1913–14
Majors	10	27	33
Minors	9	18	16
Special	5	2	1
	24	47	50

Of four majors who have been graduated, one has married, one is the director of physical education in a southern university, a third is director of a state normal school and the fourth of a large high school.

The requirements of the course are very heavy—unduly so in certain sciences. In co-operation with other departments, readjustment of certain science pre-requirements will reduce them approximately eight credits. This will permit a radical rearrangement of some subjects and increase the electives an equivalent amount. This will render it easier for those who desire to prepare for teaching other subjects as minor subjects. All those enrolled as minors are preparing to do combination work.

Inasmuch as the course must compete with other institutions where a different policy with regard to advertising obtains, and also with many private institutions having low entrance requirements and specializing on the so-called "practical" activities, the enrollment compares more than favorably with all of them.

PART II. POLICIES AND FACILITIES

Certain policies of the University with regard to the activities of this department, and of the department relative to the conduct of certain of its activities, having come up for consideration recently, it seems wise to present briefly the department's point of view concerning the matters under discussion.

Required vs. Voluntary Exercise

The University for many years has *required* that first and second year students shall take a certain amount of prescribed physical exercise each week—two periods for men and four periods for women. It has been claimed that "required" exercise has no value commensurate with the time and energy and trouble involved in "going through" it. Without doubt superior results are secured when activities give pleasure. This is just as true of English or mathematics as of gymnastics or athletics. From the standpoint of "recreation" distasteful exercise is of little value. But college physical education is not primarily *recreation.* Organic power, the sine qua non of physical and mental efficiency, is conditioned by the status of heart, lungs, nutritive system, etc. Their functioning and development are directly related to the individual's motor activity, irrespective of his state of mind.

The authorities of the United States Naval Academy at Annapolis found a few years ago that second and first class cadets (juniors and seniors) were losing in weight and strength. A system of pure Swedish gymnastics was introduced and *required* of these two upper classes with a resulting gain instead of loss of weight and strength.

This testimony is ample evidence of the value of required exercise, and there is no doubt that the need is greater here than there where they have a selected group to start with, and also a more favorable daily regimen of food, sleep, and activity.

The United States Military Academy at West Point also finds it necessary to "require" cadets to pursue a vigorous course of physical exercise, in addition to the activities involved in the cavalry and artillery drills.

The student of sedentary habit will not indulge in the necessary activity voluntarily. The long experience of colleges and schools before the requirement was established testifies to this. Required activity is not of necessity disagreeable, at least no more so than any form of muscular activity is to the man who has not maintained or acquired a desire for it.

The vast majority of students would have little systematic activity of any sort if not *required* to take it, and provision made for handling large numbers of them at one time. This

judgment is based upon the fact that 60 per cent of freshmen enter the University without any previous experience in systematic physical education, and no real experience in the ordinary vigorous games of adolescence. The result of this is the acquirement of a sedentary habit of life with its accompanying results of poor posture, lack of vitality, and deficient development.

This is further emphasized by the records of the Medical Department showing that in 1913–1914 in the examination of 1,371 men, 672 of them were placed in "Class A", 509 in "Class B", and 190 in "Classes C and D." In other words, less than 50 per cent were in such physical condition as to be permitted to indulge in any activity which they might elect. Six hundred and ninety-nine, or over 50 per cent, are required to be limited in their selection of their activity or of the activities required of them in this department.

TWO PERIODS PER WEEK

It is assumed that twice a week each of physical education and military drill is sufficient to meet the male student's motor needs. Inasmuch as the military drill is not designed for this purpose and has practically no such value, the two periods of physical education must bear the burden.

A "period" is fifty minutes. Five minutes of this must be taken to give sufficient time for change of clothes before, and fifteen minutes for bathing and dressing after, exercise. This leaves exactly thirty minutes of actual exercise twice a week, not counting the bath.

Twice a week is altogether inadequate time in which to properly organize the activities of the student, and to secure their supervision and direction in the most efficient way, or to get the maximum results of the activities which are practiced. The interval of abstinence is too long, the effects of one period do not "carry over" and cumulative effects can not be secured nor converted into habits.

While from the standpoint of the student's need, sixty minutes per week as required is an entirely inadequate provision, it is the experience of the writer, secured in twenty years of personal supervision of several thousand men, that thirty minutes

twice a week is much better than none, but three times are over 100 per cent better than twice and a fourth period adds not less than 50 per cent more to the efficiency of the work and the results to the individual.

The following table showing the previous experience in various forms of physical exercise of the freshmen entering in September, 1913, emphasizes the utter inadequacy of the physical preparation of the educated youth of this section of the country.

PREVIOUS PHYSICAL EDUCATION OF FRESHMEN

Entering Sept. 1913

Total number of students having filled out Phys. Edu. Hist. Blanks..... 1,010

	1 yr.	2 yrs.	3 yrs.	4 yrs.	Total.
Previous Physical Education in High schools.	80	156	60	93	393
" " " other institutions	77	78	26	52	233
Systematic instruction in baseball.....	53	21	19	34	127
" " " basketball.....	114	39	27	23	203
" " " gymnastics.....	99	44	15	20	178
" " " football.....	117	33	23	26	199
" " " Track and C. C.....	36	6	0	0	42
" " " other sports.....	85	20	10	32	147
No systematic instruction in any activity.....	.....	.....	.....	.....	**553**
Only one year (or season) in systematic (?) activity.....	.....	.....	.....	.....	154
Two or more years in systematic (?) activity..	.....	.....	.....	.....	303
Member of High School teams in baseball.....	86	27	16	18	147
" " " " " " basketball...	87	36	15	11	149
" " " " " " football.....	123	31	27	14	195
" " " " " " track & C.C.	70	16	3	4	93
" " " " " " other sports.	11	0	0	2	13
Men having made no teams at all	.....	.....	.....	.....	**640**

On teams 1 year.....	**237**	**or**	**23.5%**
2 years.....	**69**	**or**	**6.8%**
3 years.....	**38**	**or**	**3.7%**
4 years.....	**33**	**or**	**3.2%**
	377		

ONE HOUR OF PHYSICAL ACTIVITY DAILY

The policy announced and approved as the legitimate aim of the department is "One Hour of Exercise Daily." It is accepted that so far as possible this shall be in natural forms of athletic and aquatic sport rather than gymnastic. This raises at once the question as to the available facilities and the number to be accommodated.

November 1, 1913, there were approximately 4,400 students resident in the University—3,200 men and 1,200 women. During the winter months these numbers increased by approximately 500 short course students.

As the chief emphasis is upon out-door exercise, exclusive attention is here given to that phase of our problem.

Women: Nine tennis courts constitute the only provision specifically made for the women's outdoor exercise. Approximately three acres of Camp Randall now included in Memorial Park have been utilized for field hockey and other games. Because of trees and shrubbery there is room for one small hockey field and several courts for minor games and athletic events with a capacity of about seventy students. *Including tennis, the total capacity is approximately 110 to 125 students at one time.*

The use of the athletic field is solely on the sufferance of the Memorial Park Committee. This land has not been properly graded or drained, and has neither dressing, toilet, bathing, nor shelter facilities. The women dress at their gymnasium eight blocks from the field. A tent has afforded slight shelter and a place to remove skirts. In spite of these most serious handicaps successful work has been done in hockey, baseball, archery and other sports.

Men. The Lower Campus—across the street from the gymnasium—225 by 300 feet, approximately one and one-half acres—constitutes the chief outdoor playground and is used for all required activities of the freshmen and sophomore classes in the fall and spring and the intramural soccer and baseball. It is too small for one regulation baseball or football field but in the fall and spring classes of 70 to 90 find here their only outdoor opportunity, and the space is compelled to accommodate three class games playing crossways of the field simultaneously. It is the chief drill ground of the military department in the spring and is not available for athletic sports after 4:30 p. m. at such time.

The University Athletic Field, is exactly nine-tenths of a mile from the gymnasium. It is a total area of approximately forty acres, seven acres being devoted to the Memorial Park. Owing to the exceedingly varied grades of this land, rising forty feet in places, about ten acres only have ever been

utilized and these have been devoted primarily to intercollegiate sports. The equipment includes a quarter mile track, the bleachers and grandstand enclosing the football gridiron with permanent seating capacity of 8,200, now reduced to 2,800, the 'varsity and freshman practice gridirons, the 'varsity and freshman diamonds and nine student tennis courts. Nine courts of cheap construction have been added on other vacant University land convenient to the student quarter. The maximum practice capacity with all space in use is about 250, exclusive of cross country running. The locker room under the grandstand contains 200 lockers, shower baths, toilets and store rooms. The distance from the gymnasium and the small capacity of dressing and bathing facilities limits the use of these fields during the morning and early afternoon and restricts their use to the 'varsity squads only in the late afternoon.

The Boat Houses—two wooden structures immediately in the rear of the gymnasium—were erected in 1892. Repairs and reconstruction were planned to provide a shell house with capacity for 20 eight-oar shells and barges, a canoe and boat house with capacity for about 150 canoes and row boats and dressing quarters for swimmers and slip for the coaching launch. These changes have been deferred because of the unavailability of the state appropriation.

The present equipment includes 10 eight-oar shells and barges and 2 four-oars. It is planned to add 10 to 15 rowboats and 4 or more crew canoes. The capacity of these boats and shells will be about 150 students at one time. About 75 canoes owned by students and members of the faculty are stored here.

SUMMARY

Summarizing the foregoing, we find that the present outdoor facilities have a maximum capacity with respect to the number of students who can be accommodated at one time as follows:

Women—	9 tennis courts	36		
	Hockey, archery, etc.	74		
			110	
Men—	Lower Campus: hockey or soccer	22		
	Camp Randall: football	66		
	Track	50		
	Tennis	72		
	Rowing and boating	90		
			300	
				410

In the spring, the 3 baseball diamonds will provide for only 54 players instead of the 88 in football or soccer, but 100 could use the track and field instead of 50. The water is too cold for swimming except for a few days in June.

In connection with this summary these things are to be noted in particular:

1. *The total number that can be accommodated at one time indoors or out by the facilities provided is approximately 1/10 of the entire regular student body.*

2. The smallest provision is made for those sports and games that naturally interest the largest number of students.

3. Increased capacity may be gained by the use of class methods. This would be at the expense of voluntary participation, interest, pleasure, and the future habits of exercise—real values.

4. The space required for a game of football or baseball will accommodate approximately twice as many in practice as in a game, but the game requirement is the unit of estimate.

ONE THOUSAND PER HOUR

If possible, physical exercise should be had in the afternoon, preferably from 3:30 to 5:30, not earlier than 2:30 at least. This gives approximately three hours daily, or possibly four, considering the period from 11:00 to 12:00, within which provision might be made profitably for the bulk of the student body, but as few are free from academic requirements for the day before 3:30 and as natural inclination favors the late

afternoon, it may be expected that voluntary activity will be rather directly determined by the facilities available from 3:30 to 5:30.

There were enrolled on November 1, 1913, a total of over 4,400 students, (exclusive of short course), in round numbers, 3,200 men and 1,200 women. This is 800 more than were enrolled at the same date in 1911. It is reasonable to presume that the number soon will exceed 5,000, regularly on the campus throughout the year. Any consideration of new plans must be based on a conservative estimate of the future as well as the present.

Deducting 40 per cent for those who will never get out daily and those who for one reason or another must secure their exercise at some other time, we have a minimum of 3,000 for whose daily practice we should provide. This would mean 750 per hour, if equally distributed over the four hours available, but as all these hours are not equally favorable, as noted above, the requirement would probably rise to over 1,000 an hour between 3:30 and 5:30. As we have seen, the present capacity is less than 450 outdoors. This indicates a necessity for two to three times the present capacity to meet the need of the present and the immediate future, aside from any consideration of the space factor as influenced by the character of the activities for which facilities are required or desired.

Space Required. The consideration of *numbers* outdoors presents largely the same problem as indoors, except that the time spent by an individual in any sport or game tends to be much longer than indoors, and, therefore causes greater congestion in the late afternoon. Also the evening hours cannot be made to supplement the afternoon period to the same degree. So far as *space* is concerned, however, the problem is one of much greater difficulty because the character of the activities is such as to require much more ground per student. And the weather factor that is eliminated indoors is of prime importance outdoors. To the extent that bad weather reduces activity below the normal, fine weather stimulates it in the opposite direction and creates a necessity for liberal provision of playing spaces to accommodate the increased numbers who turn out under its influence.

In estimating the amount of space required to accommodate 1,000 or more persons at the same time outdoors in voluntary

athletic games and sports, consideration must be given to the relative interest of the participants in the various activities as well as to the relative space requirements.

Relative Interest. At the period of college life the interest of the player in ball games is at its maximum, with baseball first and tennis probably second, football, soccer, and hockey following in a group together. Tennis is almost equally popular in fall and spring; baseball in the spring probably outnumbers the other three combined in the fall, except that hockey and modified baseball command about equal interest on the part of college women. The individualistic types of exercise command a very much smaller degree of interest except in the case of swimming, which, however, is a summer activity. Cross country running and hiking are practiced by relatively few, but are increasing in interest and have the advantage of requiring no prepared spaces. Boating and canoeing command relatively large interest measured almost entirely by the number of available boats and canoes. Track and field events have a natural interest for a much smaller number than the various ball games, but have the advantage of lending themselves readily to class organizations, and so provide a valuable mode of handling large numbers in prescribed activities on a relatively small area.

A quarter mile running track with its enclosed area provides ample area for all men interested in track and field events and is the minimum provision that can be made for this activity. Women require relatively very much less space for these events.

Tennis and baseball with equal privileges would interest approximately the same number of people. As they are both at their maximum during the same season, their combined requirements constitute the major space factor. The same space used for baseball in the spring will serve for football and hockey fields in the fall. Separate consideration must be given to fields for intercollegiate games.

A tennis court requires 120 x 50 feet and is used on an average by three persons at a time (singles and doubles alternating). This is equivalent to about 1/20 of an acre per person.

A regulation baseball field requires approximately three acres but for general intramural purposes outfields may be permitted to overlap to such extent as to reduce this to two acres, approximately 1/10 of an acre per person, or twice as much as for tennis.

It is estimated that the relative interest of men in the various activities in the spring season with adequate facilities would be about as follows:

Baseball	40%
Tennis	30%
Track and field	10%
Boating and canoeing Hiking	20%

In the case of women students the proportion for tennis would probably approximate or exceed 40 per cent in the spring with 30 per cent baseball but with a reversal of these figures in regard to hockey and tennis in the fall.

With a probable average at the most favorable hour of 1,000 persons, the space requirements on the basis stated would be about as follows:

MEN—750 PER HOUR

Baseball	300	—15 diamonds	30 acres
Tennis	225	—75 courts	12 "
Track and field	75	—One ¼ mile track	7 "
Varsity baseball		—One diamond	4 "
Boating	150	—Boat house	
			53 "

NOTE: The track infield would supply the space for the varsity gridiron and the varsity diamond outfield would provide a varsity practice gridiron.

The space for track and field takes into consideration accommodations for from 20,000 to 40,000 spectators.

WOMEN—250 PER HOUR

Hockey	100	(Fall) — 3 fields	4½ acres
Tennis	100	(Spring)—30 courts	5 "
Track and field	25	One ⅛ mile track	1 "
Boating, etc.	75	Boathouse	
			10½ "

Field Houses. Supplementing these outdoor facilities there must be ample and convenient quarters for dressing, bathing, toilet, and shelter sufficient to handle the maximum number conveniently and quickly.

For the men this needs to be done by eventually locating the indoor plant in immediate contiguity to the main fields. For several years to come space under the permanent stands or a temporary Field House must be provided.

For the women the fields cannot be located within less than six blocks of their present gymnasium which is permanently located so far as the present plans are concerned. It follows,

therefore, that a Field House with full complement of dressing and bathing facilities and with shelter space of sufficient area to serve as a supplementary exercise room in wet weather is an absolute necessity.

Aquatics. There remains to be stated the need of facilities for canoeing and rowing.

There is no provision for the aquatic sports of the women. The immediate need for such is apparent. A house capable of storing several eight-oar barges and large 16 to 24 paddle canoes, and row boats and canoes having a capacity of 50 persons or more per hour would ensure tremendous interest in this valuable activity, make possible the use of a facility largely idle at present and permit the establishment of boating as a required class activity with the result of reducing in some measure the awful annual fatality list from overturned boats, besides giving the student a method of exercise and recreation suitable in all his after life. This house should also serve the swimming needs of the women in the summer session and should have a dressing capacity of 100 or more per hour with necessary toilet and bathing facilities.

The men's boathouse is 21 years old and is utterly inadequate to the present demands. Repairs and alterations will temporarily relieve this condition and permit some extension for a few seasons, but with the provision of row boats and large canoes for the men, as contemplated for the women, the capacity of the present buildings will be quickly reached. Also, with the eventual removal of the gymnasium there will arise the necessity for separate dressing, bathing, and toilet facilities for which the present buildings are unsuitable. Of pressing importance, aside from these considerations of the future, is the ever present danger of fire in a tinder box filled with most inflammable material.

The eventual need is for a commodious fireproof building, properly heated and ventilated with every administrative and social convenience and with room for twenty or more eight-oar shells and barges, four-oars and singles in proportion, a coaching and a patrol launch, and row boats and canoes having a capacity of 150 students per hour; besides storage room for 100 or more canoes privately owned by students and faculty members.

Until such provision is available the completion of the alterations and additions authorized by the legislature of 1913 will provide the necessary space for further growth and development.

Both boat houses should have ample pier space for swimming and for loading and unloading boats and canoes safely and quickly. These should be supplemented by permanent breakwaters affording protection from rough water and providing a safety harbor in case of storms.

Students in Physical Education Activities

Men

Summary of First Semester, 1913-1914

Men—Undergraduates—Nov. 1, 1913			2,915
General Gym. class (Games only—Oct. and Nov.)		678	
*Athletics and Aquatics—			
Intercollegiate	115		
General	701		
		816	
Corrective		160	
			1,654
56.6% of University enrollment			

Summary of Second Semester, 1913-1914

Men—Undergraduates (net)			2,639
General Gym. class (Games only—April and May)		542	
*Athletics and Aquatics—			
Intercollegiate	257		
General	651		
		908	
Corrective		189	
			1,639
62.1% of University enrollment			

This does not include men playing tennis, handball, intercollege and interfraternity baseball, bowling, canoeing, and swimming *outside* of class and team hours.

Of 1,317 new male students examined by the Medical Adviser there were:

Prohibited from strenuous, competitive sports	509, or 39%
Restricted to individual exercise	190, or 14%
Unrestricted	616, or 47%

Women—Summary for Year 1913-1914

Women—University enrollment for year			1,141
Enrolled for Physical Education—			
Freshmen and Sophomores		495	
Upperclassmen		247	
			742
65% of University enrollment			
Prohibited competitive sports			206
Athletics, etc.			536

*NOTE: The activities outside of the general classes which have been elected by students include the leaders corps, general gymnastics, apparatus, track and field, rowing, football, soccer, swimming, basketball, cross country, baseball, wrestling, fencing, hockey, and hiking.

Men's Athletic Facilities

Institution	No. male Students 1912-13	Athletic Fields			Baseball Diamonds		Football Fields		Tennis Courts	Maintained by		Source of Funds		
		Total acres	Varsity	Intramural	Varsity	Intramural	Varsity	Intramural		University	Athletic Assn.	University	Student Fees	Gate Receipts
Harvard	4,523	65[1]	.....	.....	1	5	1	4	40	.....	/	.....	.....	/
Princeton	1,568	38	20	18	1	4	2	3	24	In. Mur.	Var.	.....	/	/
Michigan	4,250	77.45	38.7	38.75	1	6	1	5	29	.....	/	.....	26,500	45,000
Notre Dame	1,028	.....	20	....(3)...	1	10	2	5	?	.....	/	.....	$10 per Student	/
Chicago	3,488	12	.....	.....	1	1	1	1	29	/	.....	.....	/	/
Illinois	3,824	72	12	60	2	8	2	3	21	In. Mur.	Var.	1	.....	/
Indiana	1,123	6	3	3	1	2	1	1	5	/	.....	1	.....	.....
Iowa	1,388	6	.....	.....	1	1	2	0	8	/	.....	.....	.....	/
Minnesota	3,181	20	(x)20	Drill Ground	1	2	1	1	15	Tennis	/	1	.....	/
Northwestern	2,400	37	7	30	1	2	1	6	17	/	.....	1	/	.....
Ohio State	2,614	.....	.....	...(3)....	1	5	1	2	10	.....	/	.....	/	/
Wisconsin	3,032	35(2)	(x)13	2	1	2(4)	2	2	20	/	.....	1	.....	/

NOTE: [1] 25 acres undeveloped.
[2] 20 acres undeveloped.
[3] General Campus.
[4] Temporary. Restricted space.
x Used for both Varsity and Intramural.

CONCLUSION

In concluding this report two tables are submitted, one summarizing the statistics showing the number of students participating in the registered activities of the men for the first and second semesters of 1913–14, and of the women for the year 1913–14 as a whole. The net result shown by this table is that *two-thirds of the entire undergraduate body* of the University have been registered and engaged in the activities of the department throughout the year. In addition thereto is a large proportion of students engaged in active outdoor sports in the fall and winter and spring of whom no record is kept nor can be secured.

The second table exhibits a comparison of the provision for men's outdoor athletics in twelve different large universities of the East and Middle-West. Study of this table shows the University of Wisconsin to be exceeded by eight of these institutions in the amount of space devoted to outdoor facilities; by seven of them in the number of fields for baseball and football; by six of them in the number of tennis courts. Yet but four of those so exceeding Wisconsin, as noted, have larger student enrollment and in two of these—Harvard and Chicago—a very large percentage consists of professional students not living upon or near the Campus. This table emphasizes the necessity for the development of this particular feature. The two tables together show the relatively large use that is being made of inadequate facilities at The University of Wisconsin.

Respectfully submitted,

GEO. W. EHLER,
Director, Department of Physical Education.

REPORT OF THE DIRECTOR OF THE WISCONSIN FREE LIBRARY COMMISSION AND THE LIBRARY SCHOOL OF THE UNIVERSITY OF WISCONSIN

President Charles R. Van Hise,
The University of Wisconsin.

Dear Sir: As Director of the Library School of The University of Wisconsin, I have the honor to submit the following report for the biennial period ending June 30, 1914.

During the eight years which have elapsed since the establishment of the school the number in attendance has so increased that it has been necessary each year to add to the equipment in furniture, lighting, books, typewriters, and supplies, as well as to increase the instructional service. The curriculum has also been a matter of growth, the effort being for a wise correlation of courses, for the establishment of a proper relation between the theoretical and the practical and for the elimination of the non-essential.

GRADUATES

For several years the number graduating from the Library School of the University exceeds the number graduated from any other similar school in the country. In 1907 the number graduated was 22; in 1908 19; in 1909 19; in 1910 26 in 1911 24; in 1912 31; in 1913 32; in 1914 29. The number in the class which has enrolled and will probably graduate in 1915 is 36. The total number graduating up to and including 1914 is 202.

There never has been the slightest difficulty in obtaining positions for the graduates of the school. In 1913, out of 31 who were graduated, 29 had positions at the time of graduation. In

1914 out of 29 who were to graduate 26 had received appointments before graduation.

A very large percentage of graduates also remains in the profession. Of the 202 who have graduated, 23 have married, 3 are taking further work in educational institutions, 3 are incapacitated because of ill-health, 4 are detained by home exigencies, 3 are temporarily out of positions, 2 are not recommended because of lack of efficiency, and 164 hold library positions and are in active service. Although the number graduated is very much larger than the number of positions suitable for library graduates in this state, a very considerable number are located in Wisconsin. Of those graduating in 1913 seven went immediately into positions in Wisconsin libraries, while of those graduating in 1914 fourteen went directly to Wisconsin positions.

THE JOINT COURSE

The plan for a joint course offered by the Library School in connection with the College of Letters and Science, under which a student might work for a Bachelor's degree and at the same time complete the work required by the Library School, was changed during the last school year. As it now stands the work in the Library School is performed during the senior year. Juniors having 96 credits and having passed the entrance examination of the Library School at the end of their junior year are eligible to take the Library School course during their senior year. Twenty credits are allowed for work in the Library School, which, with the four credits allowed for a thesis, aggregate the number of credits required for graduation.

PUBLIC LIBRARIES AS LABORATORIES

In founding the Library School a new and theretofore untried method of library training was inaugurated. It might be termed the laboratory method. While in residence and taking the regular course of the Library School each student each week renders at least three hourse of service in the Madison Public Library, performing in turn practically all of the various duties devolving upon the librarian of a public library.

This apprentice system has, to this extent, been employed by other library schools. In the Wisconsin Library School, how-

ever, the system is carried much further. From the beginning of the academic year until the first of February strong emphasis is placed upon the fundamental technical and professional courses. Then during the months of February and March the academic work in residence is given up and the public libraries of the state become the school's laboratories. Upon the first of February each student is sent out into a carefully selected library for practical work under conditions actually existing in public libraries. In planning the work, moreover, the instructors have in mind the principle that the services to be rendered by the student must be of definite value to the library in which they are performed, since work that is not of importance from the standpoint of the library is likely to be as unprofitable to the student as to the institution.

Each student must work from seven to eight hours, six days in the week, during the months of February and March, doing the regular work of the library—work which is often difficult and laborious. She is expected to work as intelligently and as faithfully as though a hired helper. She must submit herself to the direction and discipline prevailing in the local institution. Her work is supervised and inspected by the instructors of the school. At all times she is made conscious that unless her services prove of value to the library she can receive no academic credit in the Library School.

As a matter of fact this field work has proved of very substantial value to the libraries of the state. During the eight years since the school was established the students have rendered an aggregate of approximately 400 months of service to the public libraries of the state, and always to those libraries which have most needed assistance. Putting this in other terms, the service rendered gratuitously by the students of the school has amounted to the full time of 33 skilled workers each working for one year.

By these years of service new libraries have been organized and old libraries have been reorganized; new card catalogues have been made and old ones revised, modernized, and brought up to date; in many communities systematic co-operative work with the schools has been started; story hours have been established and conducted; the character of the book selection has been improved. Many other new lines of library activity have been instituted, and through publicity methods, suggested and worked

out by the students, the public has been informed of the old and new activities of the library. It is to be noted that this service has been rendered during the busiest months of the year for libraries.

While this serivce has been of incalculable value in the library development in the state, its greatest value has been in the training which it has given to the library students themselves.

Its special value may be thus stated:

1. Field work links theory with practice. It is placed in February and March and the curriculum is so planned that the fundamental technical and professional courses are completed before the work is assigned. This gives the students opportunity to apply in a practical and concrete way the lessons of the semester which has just closed.

2. The field work supplements the student's previous experience. Because of the entrance requirements for admission to the school, the faculty are in possession of much information regarding every student before the course begins; especially do we know of any previous library experience. If a student enters the school after several years of such experience, it is possible to round out that experience by giving her field work along entirely different lines, such as organization, serving as acting librarian, and even the visiting of libraries for the commission, thus putting her in training for a position on a library commission. If a student enters with little or no library experience, she is placed in one of the best organized libraries of the state where she will have opportunity to work as an assistant under the direction of a trained librarian.

3. Benefit results to the student through the change in the nature of her work. The variety between the class room instruction and the practical work is welcomed by the class. The interest and energy of the student in her work almost invariably increase during this period of field practice.

4. It affords an opportunity for testing the student's ability and initiative. The student works under the close observation of instructor and librarian. A more complete knowledge of her fitness to fill a psition is the result; weaknesses and faults are seen and can be corrected. The test of actual work is fairer than one based upon academic scholarship. On the student's side the gain in confidence and poise is marked, and with these a knowledge of her strength or adaptability for each kind of work.

FIELD WORK IN 1913 AND 1914

For the biennial period 1913–1914, the field work of the Library School was carried out as usual.

In 1913, 37 libraries profited by the work of the students, and 35 students had the actual experience of working in libraries. The amount of work accomplished by the students aggregated a total of 65½ months of work for the state, the equivalent of the entire time of six skilled workers for a year.

In 1914, 31 libraries profited by the work of the students, and 35 students had the actual experience of working in libraries. The amount of work accomplished by the students aggregated a total of 61 months of free assistance to the libraries of the state, more than the equivalent of the full time of five skilled workers for an entire year.

A NEW COURSE FOR SPECIAL LIBRARIANS

In the year 1913–14 the Library School, in co-operation with the Legislative Reference Department of the State Library Commission, offered a new course of special training for legislative and municipal reference work and the various sociological phases of library service. This course prepares for distinctly specialized library work in the field of public affairs, as distinguished from the more general public library work. It is intended for college graduates with special aptitude and personal qualifications for this type of library service who have a definite preparation in political science, economics, and sociology. There is a demand for trained library workers in this field where knowledge of subject matter is of great importance. This course offers an organized training which supplements this knowledge of subject matter with the more essential of the technical and professional phases of library work necessary to insure good library administration.

Approximately one-third of the student's time is devoted to selected courses at the University, depending both upon the previous preparation of the individual student and the particular branch of library work he expects to enter. About one-third of the time is taken up with the bibliographic and technical library training. This includes the fundamental courses of library instruction so modified that the essentials of professional training

may be obtained through close application with a considerable saving of time. The remaining third of the time is spent in special instruction as to the methods and materials of special libraries, combined with actual practice in the legislative reference library and elsewhere. Research work upon practical problems arising in the work of various state and municipal departments is assigned to each student.

In the first year seven students, four men and three women, were admitted to the course. The work was carried through the two semesters of the regular University year, together with a month of apprentice work in some library of this special type.

DISBURSEMENTS ON BEHALF OF LIBRARY SCHOOL

The following is a statement of the disbursements made by the Library Commission for the maintenance of the school for the years ending June 30, 1913 and June 30, 1914, respectively.

In the item "salaries" is included the compensation paid those who do the regular instructional work in the Library School. This item does not include, however, the salary of the Secretary of the Library Commission who lectures and is ex-officio the Director of the Library School, nor the salary of other members of the commission staff who render services to the school. On the other hand the instructional staff whose salaries are included in this item perform duties for the Library Commission which are not strictly within their province as instructors, these services resembling more the extension work performed by other University instructors. The statement so far as this item "salaries" is concerned must be considered, therefore, as somewhat in the nature of an approximation.

	1912-13	1913-14
Quarters including fuel, janitor service, insurance, repairs, furniture	$1,148.07	$1,296.02
Salaries	8,781.95	10,657.45
Traveling expenses	1,241.41	779.33
Lectures, including expenses	628.85	520.25
Light, telephone, incidentals	294.25	242.76
Books, periodicals	396.18	426.01
	$12,690.71	$13,921.82

Respectfully submitted,

M. S. DUDGEON,

Director.

REPORT OF THE COMMANDANT

President Charles R. Van Hise,
The University of Wisconsin.

Dear Sir: Complying with your instructions, I have the honor to submit to you the following biennial report for the Military Department of The University of Wisconsin for the period July 1, 1912–June 30, 1914.

ATTENDANCE

	1913	1914
Drilling	740	1,024
Exempt, permanent physical disability	40	50
Exempt, aliens	20	25
Exempt, previous drill	40	57
Exempt, adult specials	30	18
Exempt, normal graduates	30	10
Deferred, working way	147	64
Deferred, temporary physical disability	100	112
Excused, athletics	192	121
Total	1,339	1,481

The totals noted above are those reported at the annual inspection in May, at which time the Corps is always at a minimum. For example, December 1, 1913, there were 1,480 men under instruction and at the close of the first semester January 1914, there were 1,357 men taking drill.

ORGANIZATION

On my arrival here in January, 1913, the corps was organized as a regiment of 12 companies, a hospital company, an engineer company, and a band. The rapid increase in attendance

rendered necessary the organization of a fourth battalion composed entirely of sophomores. The great and growing interest in the band necessitated a "feeder" section. This has greatly improved the quality of playing and attendance in the main band. The director, Major Mann, now has available excellent understudy material for every position.

At the opening of the fall semester, the companies are much too large for four to drill on the floor at one time and much too large to be satisfactorily controlled by the officers. It is therefore recommended that the crops be organized as five battalions and divided into two regiments but leaving the extra regimental officers to a later date, when the added expense will be absolutely necessary.

The engineer company in 1913 constructed two permanent bridges of military types on the University Drive which were highly commended by the Federal inspector. In 1914 they built and laid out the target pit and range.

The hospital company, under the enthusiastic and efficient direction of Lieut. Colonel and Surgeon, J. C. Elsom, has acquitted itself creditably at both inspections.

WORK ON THE DEPARTMENT

On arival here, it was found that the only method of imparting military knowledge to the officers and men of the corps was by means of evening talks, attendance on which was voluntary and averaged about 30. Bearing in mind the three-fold purpose of the department—to educate men to command infantry companies in time of need—to develop character—and to make better and stronger citizens, the Commandant, after consultation with President Van Hise and with the approval of the deans and faculty, abolished the evening lectures and substituted therefor two study courses which comprise military law, field engineering, field service regulations, military topography and sketching, war games, infantry drill regulations, guard duty, firing regulations and military hygiene. The official text and publications used in the army service schools form the basis of the work. Fifty-one different students took the

work during the past year. Graduation credit is allowed as for other scholastic electives.

As noted in reports of my predecessors, the work of the battalions is seriously interrupted by other necessary activities such as convocations, concerts, basket ball, etc. The Commandant, instead of entirely dismissing the ousted battalion or battalions, transferred them to the lecture auditorium of the Chemistry building and there gave talks on various phases of military life. His personal collection of lantern slides, many prepared especially for these emergencies, illustrating much of army life in the Philippines, Hawaiian Islands, and in the states, were used extensively. Lectures have also been given to the sophomore battalion (4th Battalion) twice a week during December, January, and February. The topics were as follows: (1) Extended Order, (2) Field Engineering, (3) Map Reading, (4) Security and Information, (5) Camp and Personal Sanitation, (6) First Aid, (7) What an Officer Must Know, (8) The Serious Side of Military Education, (9) Our Army and Citizenship, (10) Field Service Regulations (11) Military Defense of Hawaii, (12) Our Foreign Possessions—(four of these talks) (13) The Daily Life of the Soldier, (14) Theory and Practice in Rifle Fire, (15) The Other Side of the Peace Question, (16) Excused from Drill, If Not, Why Not?

The law provides that both freshmen and sophomores shall receive 84 hours a year of instruction. This has not been carried out with the second year class, largely because all efforts were directed toward close order drill. It is not well to require a man to repeat the simple movements of the recruit freshmen the second year. But beginning next fall, the sophomore will drill from October first on. This is readily done by giving them work of an advanced character—extended order, bayonet exercises, guard duty, map reading, company administration, first aid, camp sanitation, etc. All of these are subjects required by the war department, are all of great value to company commanders, and much of the work is of practical value to the civilian in time of peace.

Part of this is done on the drill floor and part of it in class rooms. A maximum of one third of the total time is authorized for theoretical instruction. We therefore set aside one hour a week for twenty weeks when each Captain has his com-

pany in a class room. There he quizzes his men in drill regulations, etc., demonstrates each new movement in squad company or larger unit, manual of arms, etc. This avoids explanations of an extended character on the drill floor where, owing to the noise and confusion, the explanations may not be heard at all and the student is precluded from asking questions. This method not only serves to advance the grade of the drill itself, but affords the officers a splendid opportunity to do actual teaching work and since the men better understand what is required of them, dissatisfaction is lessened. The plan has worked most satisfactorily all this year.

A much needed clerk has been authorized for the department thereby releasing Sergeant Atkins from the desk and permitting him to be of direct assistance to the Commandant as a drill master. The work of Sergeant Atkins has been most satisfactory, his loyalty, efficiency, and industry being exceptionally high.

The target work has been largely in the hands of the Rifle Club. This has had a total membership of 300 men, nearly all of whom were members of the corps. Certain changes have been made in the galleries whereby safety has been increased and capacity raised from four to six men at a time. It is, however, unsatisfactory as vibrations from the running track ruin accurate shooting.

The lighting arrangements are poor at best and accommodations totally inadequate. The rental of the state rifle range at Verona has been discontinued and by rigid economy the department has saved sufficient funds from this year's appropriations to construct a range on University ground. Approved by the President, Dean Russell courteously granted sufficient land for the purpose. This will afford a safe range back to 300 yards and will be within walking distance of all students. It is planned to make the gallery and range work essentially sophomore in character.

THE BAND

The band, having been divided into two sections, has steadily improved. With the organization into two regiments, the second section will become the band for the second regiment.

Care must be taken, however, that neither band becomes unwieldy. A limit of fifty pieces should be placed on the first and thirty on the second band.

UNIFORMS

Regent action during the past year has now made it possible to secure uniforms under contract at a cost of $10.13. This insures correct fit, high quality, uniformity of shade, and a saving to the student of about $4.25 per uniform. Provisions were also made for the disinfection, under the supervision of the Department of Clinical Medicine of second hand uniforms purchased by the students.

It is recommended that a dark blue flannel shirt be added to the uniform, for sophomore companies only, as their work is more active than that of the freshmen and the close fitting blouse will prove a great disadvantage as well as discomfort to the men.

ASSISTANT COMMANDANT

The services of retired Sergeant Major Atkins has been of great value to the department. His hearty and loyal co-operation in the plans of the Commandant have been beyond criticism. Now that the work of the department has been started on a progressive basis Sergeant Atkins will be given again the opportunity of being an Assistant to the Commandant in the instructional work instead of remaining a clerk. His long experience in drilling and training men is of even greater value than his clerical ability.

ATTITUDE OF STUDENTS

This has undergone a decided change for the better. Instead of endeavoring to avoid drill, the students appear desirous of taking it. Much of this feeling is due to the progressive character of the instruction, the lectures and study courses and the avoidance of the long and late drills heretofore held in April and May. With the addition of adequate gallery and range facilities now under way, added interest will be aroused.

The complete separation of the sophomore and freshmen classes and division into companies by colleges, will add an element of competition of great value.

THE ARMORY

This question has been argued and advocated for the past six years but no definite action has been taken. The present building while adequate twenty years ago when erected, is far too small for the use of both military and athletic departments.

The building is also the only one of sufficient size to accommodate convocations, concerts, etc. and is the only place in which the intercollegiate basket ball games can be played. This manifold purpose of the drill floor seriously interferes with drills, one battalion losing seven hours out of forty. These losses were unavoidable and every one has done their best to make dates which do not conflict with drill. The campus, a piece of ground 240 x 290 feet is entirely inadequate for our drill outdoors when eight companies have the use of the same space. Baseball games must be broken off in May and football games in October.

There is only one solution to the problem. A new Armory, built on Camp Randall as a central location, intended wholly and entirely for the Military Department and a drill ground at least 400 x 600 alongside for outdoor work. Illinois has recently erected such a building, New York is building one for Cornell, and Wisconsin should not be long behind.

THE COMMANDANT

The remuneration of the Commandant is insufficient considering the quantity and quality of the work accomplished. Army officers are under heavy expense in moving to Madison, they must purchase all the household furniture necessary for living, they are deprived of commissary privileges, and medical care for their families is not furnished by the government. During the past year the Commandant has prepared and delivered

more than twenty lectures where attendance was 300 or over each lecture, taught five hours a week in class room, kept office hours one to four hours a day depending on the time of the semester, and been present at all drills of all companies, an average of eight hours per week. The remuneration should be $1,000.00 per year.

Respectfully submitted,

P. G. WRIGHTSON,

1st Lieutenant, U. S. Army,

Commandant.

REPORT OF THE COMMITTEE ON ACCREDITED SCHOOLS

President Charles R. Van Hise,
The University of Wisconsin.

Dear Sir: The biennial report of the Committee on Accredited Schools and Appointments for 1912–14, during which period Professor Elliott was Chairman of the Committee for 1912–13, and the undersigned for 1913–14, is herewith submitted.

Tables I to IV set forth the essential statistical information so far as it relates to accredited schools, including for comparative purposes similar data from 1908.

TABLE I

	1908–09	1909–10	1910–11	1911–12	1912–13	1913–14
No. of schools inspected, excluding inspection for vocational subjects.....	145	159	168	171	182	189
No. of schools visited by inspector of high schools	72	57	65	51	32	38
No. of schools dropped from the accredited list (by mutual agreement or for cause)	5	6	4	2	1	2
No. of schools added to the list.....	12	21	26	14	21	18
Total number of accredited schools.....	300	315	*259	271	291	306

* By action of the faculty the inspection and accrediting of secondary schools outside of Wisconsin were discontinued at the close of the academic year 1909–10.

The noticeable decrease in the number of schools visited by the Inspector of High Schools is caused by the increase in the time required for the work of appointments and by the increasing specialization of inspections by members of the faculty concerned in the training of teachers.

TABLE II

Showing Accredited Relation of the Free High Schools of the State

	1908-09	1909-10	1910-11	1911-12	1912-13	1913-14
Total number (4 year course).....	268	286	292	300	318	322
Number accredited	186	205	229	238	258	269
Number not accredited.....	82	81	63	62	60	53

TABLE III

Showing Composition of the List of Accredited Schools

	1908-09	1909-10	1910-11	1911-12	1912-13	1913-14
Free high schools.....	186	205	229	238	258	269
Independent high schools.....	14	13	12	12	12	11
Academies and private schools.....	20	18	18	18	21	26
Total number of accredited schools.....	220	236	259	268	291	306

Perhaps the most important development in the Committee's work has been the increase in the inspection of vocational subjects. Since the action of the faculty and Regents accepting for entrance to the University inspected and approved high school courses in agriculture, commercial work, domestic science and manual arts, there has been a very great increase in the number of these courses in the high schools. Table IV gives the number of schools inspected in special subjects and the number of schools accredited, without regard to the number of units accredited.

TABLE IV

	1911-12	1912-13	1913-14
Number of schools inspected for agriculture.....	.....	20	18
Number of schools accredited for agriculture.....	.....	15	23
Number of schools inspected for commercial work.....	.....	90	50
Number of schools accredited for commercial work.....	.....	67	82
Number of schools inspected for domestic science.....	.....	5	.....
Number of schools accredited for domestic science.....	0	.....	.....
Number of schools inspected for manual arts.....	68	52	52
Number of schools accredited for manual arts.....	43	60	75

This table shows that inspection in agriculture, commercial work, and manual arts has been well provided for. No satisfactory arrangement has, however, been made so far for inspection in domestic science. The problem of a more specific definition of units in the vocational subjects will soon have to be faced.

The more important questions with which the Committee has been concerned are:

1. Greater uniformity in standards of inspection and accrediting. The increase in the number of inspectors both for academic and vocational subjects makes this an urgent problem. Frequent special conferences of all inspectors have been held during the past two years for the purpose of securing such standards and uniformity in evaluating work. It is hoped that during the coming year a more definite formulation will be made.

2. Increase in the frequency of inspections or a prolongation of an inspector's visit to the smaller high schools. The inspectors can be of the greatest service in the small high school where close supervision can not be given by the principal or superintendent, who has the supervision of both the elementary school and the high school and teaching in the high school to care for. Half yearly inspections in such schools would be of undoubted service.

3. With the increase in the number of schools accredited, inspection for purposes of accrediting has been subordinated to inspection for purposes of constructive service to the schools. By increasing the specialization of inspection through utilizing as inspectors those members of the faculty who are in charge of departmental teacher's courses, the effectiveness of the Committee's work has been greatly increased. The great increase in the number of requests from schools for special inspectors to assist in the solution of particular local problems is an evidence of this. Closer co-operation with the high schools in this direction will increase the efficiency of the University's service.

Table V summarizes the work of the Committee on Appointments to teaching positions.

TABLE V

	1908-09	1909-10	1910-11	1911-12	1912-13	1913-14
Number of men enrolled	135	153	149	184	206	207
Number of women enrolled	327	312	392	481	456	476
Total	462	465	541	665	662	683
Number of graduating class—men	.....	.....	.....	36	52	56
Number of graduating class—women	.....	.....	.....	195	164	186
Total	176	152	178	231	216	242
Number of requests for teachers from Wisconsin	473	540	588	578	485	525
Number of requests from other states (including from agencies)	314 100	430 120	471 146	472 99	319 61	513 44
Total requests	787	970	1,059	1,050	865	1,082
Total number of requests excluding those from agencies	690	836	907	951	804	1,038
Number of requests for teachers from secondary schools	616	781	862	929	728	923
(including from agencies)	42	77	89	61	45	40
Number of requests for teachers from higher institutions	171	189	197	121	83	159
(including from agencies)	65	57	63	38	15	4
Number of requests for which Committee made no recommendation	86	150	207	207	159	166
(including from agencies)	41	69	90	47	31	.....
Number of candidates securing new positions	316	340	364	446	414	466
Number of candidates remaining in old positions	53	57	65	77	91	85
Number of candidates giving up teaching	18	30	45	68	92	88
Number of candidates continuing study (not including assistants, fellows and scholars)	28 8	13 8	32 17	22 25	23 14	26 10
Number of candidates assisted by Committee	304	325	348	248	230	257
Number of students and graudates not enrolled who were assisted	.....	.....	.....	18	19	28
Number of graduating class taking up other work	38	21	34	58	32	46
Number of graduating class securing teaching positions	140	129	143	200	172	175
Number of candidates still on list (many of these enrolled after opening of school year)	91	112	111	89	61	46
Number of reported vacancies	.....	.....	.....	.....	123	112
Number of candidates securing these positions	16	11	9	9	13	9

In view of current interest in the Committee on Appointments a more detailed exposition of the work done during the past year is included in the following Tables VI and VII.

TABLE VI

Total number University graduates securing positions for 1914-15, up to Sept. 1, 1914		324
Number placed by the Committee	192	
Number assisted by the Committee	35	
Total number placed and assisted		227
Number placed and assisted to positions in Wisconsin (exclusive of the University)	141	
Number placed and assisted to positions in the University (including 7 Teaching Fellows)	13	
Number placed and assisted to positions outside of the State	73	
Total number placed and assisted		227
Number placed and assisted to positions in Wisconsin High Schools	118	
Number placed and assisted to positions in Wisconsin prncipalships and superintendencies	11	
Number placed and assisted to Wisconsin County Training Schools	4	
Number placed and assisted to Wisconsin Normal Schools and Colleges	3	
Number placed and assisted to other positions in Wisconsin	5	
Total number placed and assisted to Wisconsin positions		141

TABLE VII

Analysis of Class of 1914

Number receiving Teachers' Certificates in 1914 (exclusive of those receiving certificates and advanced degrees)		198
Number of those receiving certificates registering with the Committee (exclusive of those receiving advanced degrees and certificates)		181
Number of graduates of 1914 who secured positions	138	
Number placed or assisted by Committee on Appointments	94	
Number unassisted by the Committee	44	
Number on Committee's lists	43	
Total		181
Number placed or assisted to positions in Wisconsin High Schools	48	
Number appointed to University (including Teaching Fellows)	11	
Number placed or assisted to other positions in Wisconsin	6	
Number placed or assisted to positions outside the State	29	
Total		94

The number indicated as still on the committee's list (43) includes those who are continuing work as graduate students, those who have withdrawn from candidacy this year, and those who have accepted other than teaching positions for the year, and those who have enrolled recently.

The placing of University graduates who are candidates for teaching positions in the positions for which they are best fitted and prepared, and where they can render the greatest service to schools and communities, is one of the most important functions of the University. This work has increased greatly from year to year, necessitating an increasing amount of time on the part of the Secretary. It is believed that efficiency can be best secured by a separation of the Committee on Accredited Schools and Appointments into two committees, or that the work of ap-

pointments be transferred to the Committee on the Training of Teachers.

On September 1, 1914, Professor A. W. Tressler, after fourteen years of efficient service as Inspector of High Schools and Secretary of the Committee on Accredited Schools and Appointments, tendered his resignation to the Board of Regents. His wide acquaintance with educational conditions throughout the State and his intimate knowledge of the professional qualifications and success of the teachers trained and recommended by the University make his resignation a distinct loss to the Committee and to the institution. The vacancy has been filled by the appointment of Professor Thomas Lloyd Jones as Secretary of the Committee and Inspector of High Schools, and Mr. D. W. Morton, Inspector of Commercial Work, as Assistant Secretary of the Committee on Appointments.

Respectfully submitted,
V. A. C. HENMON,
Chairman.

REPORT OF THE LIBRARIAN

President Charles R. Van Hise,
The University of Wisconsin.

Dear Sir: I submit herewith a brief report on the growth and condition of the University Library for the biennial period ending June 30, 1914:

GROWTH

The total number of bound volumes in the general University Library and the departmental libraries accessioned with it on June 30, 1912, was 165,613. On June 30, 1913, this number had increased to 175,390, and on June 30, 1914 to 186,307. The accessions for the biennial period, therefore, numbered 20,694. The statement of increase does not include the library of the Law School, now numbering 21,000 volumes, nor the Woodman Astronomical Library at the Washburn Observatory of 2,600 volumes. The total strength of the University Library and all of its branches at the present time is 210,000 volumes and 45,000 pamphlets.

The above figures do not give an adequate idea of the book resources available to all persons at the University, as the Library of the State Historical Society of Wisconsin, numbering 183,000 volumes and 188,000 pamphlets, and the Library of the Wisconsin Academy of Sciences, Arts, and Letters, of about 5,000 volumes, both located in the same building as the University Library, are equally accessible to all. The grand total of the three libraries is now estimated at 398,000 volumes and 233,000 pamphlets.

CATALOGUING DEPARTMENT

The cataloguing staff during the past two years has kept well up with the current accessions, has made excellent progress in the needed recataloguing of certain sections, and has practically completed the cataloguing of the library of the Wisconsin Academy of Sciences, Arts, and Letters. The assistant librarian in charge of this work reports that 9,776 new volumes were catalogued in 1912–13 and 12,463 in 1913–14. Figures such as those just given do not, of course, adequately show the amount of work done, as any given volume may be represented in the card catalogue by many entries. In addition to the above, during the biennium 8,000 German dissertations have been classified and catalogued.

LOAN AND REFERENCE DEPARTMENT

It is most difficult in a report of this character to give any adequate notion of the loan and reference work, which is perhaps after all the most important work which the library does, at least for the university of today. As stated in a previous report, statistics as to recorded loan and reference use have practically no significance, owing to the freedom given in the unrecorded use of books in the reading rooms, seminary rooms, and stacks. It has been possible of late years, with an enlarged and experienced loan and reference staff, to give much better service in this department, but there are still many possibilities of helpful service which the press of work at certain hours does not permit. The increased number of afternoon classes has relieved the pressure on the library at rush hours, and yet resulted in an increased use of the library over the entire working day.

Notwithstanding our growth, we constantly find it necessary to borrow material from other university and reference libraries for the use of instructors and advanced students. Unless the books are needed for actual class use, all transportation charges are ordinarily paid by the person for whose benefit the books are borrowed. The University is under obligations to many

institutions for such favors. To some of these same institutions and to others we have frequent occasion to loan from our collections. The library loans to other libraries, or educational institutions, for the use of individuals, and not ordinarily to individuals directly. Both libraries are especially glad to be of service to the college and public libraries of Wisconsin, and these libraries apply to us frequently for the loan of books and for bibliographical assistance.

The University Library and the State Historical Library cooperate freely with the Department of Debating and Public Discussion of the University Extension Division, and with the Wisconsin Free Library Commission in this matter of loans to libraries and schools in the state. Our feeling is that where books, not in immediate demand, can be of service to residents of the state outside of Madison, it is in accord with the general policy and aim of the University to make them available. We have not found that a liberal policy in this matter has seriously interferred with the use of the library by faculty and students. Such books are, of course, loaned for a limited period and subject to immediate recall, if necessitated by need as a class reference. Of course reference works in constant demand and books of great rarity or value cannot be available for such loans.

SUMMER SESSION

Until 1914 the library had never been open evenings during the summer session, as there had to that date not appeared to be sufficient demand to justify the increased expense. In the summer of 1913, the Director of the Summer Session and the Librarian became convinced that with the increased numbers the time had come for evening opening. The matter was presented to you and provision made in the budget of 1914–15 for evening opening during the Summer Session of 1914. The results justified the experiment, and we feel convinced that in the future the library during the Summer Session should be open the same hours as during the regular academic year. These hours are 7:45 a. m. to 10 p. m. daily except on Saturdays and Sundays. On Saturdays the library closes at 9 p. m. to permit the weekly cleaning of the reading rooms. These hours appear to meet adequately the present demands of both faculty and students.

BUILDING

The most important event in the history of the library during the biennium was, perhaps, the final completion and occupancy of the new northwest wing. The University Library, which had shared the southwest wing with the Historical Library for nearly fourteen years, was moved to the new wing during the Easter recess of 1914. The removal was so carefully planned and executed, under the direction of Assistant Librarian Burke, that there resulted little or no interruption in the use of the library by readers.

The University Library occupies all of the new wing except the top floor, which is used for museum purposes by the Historical Society. As a result, the University Library is most conveniently housed and, for the immediate present at least, has adequate space to shelve its accessions. It is a great relief to escape from the congested conditions of the past few years, which rendered impossible proper care of books and adequate service to readers.

On the completion of the new wing, the library was able to give up its use, for administrative purposes, of room 118 on the first floor of the main building. By vote of the faculty library committee, this seminary room was temporarily assigned to the Department of Political Economy and the Department of Semitic Languages for joint use. The demand from other departments for more adequate accommodations for seminary room purposes could unfortunately not be met.

NEEDS

Under the heading of needs in previous reports, I have emphasized two matters, *viz.*, increased accommodations for book storage and the demand for more books. The first need has been adequately met by the new wing. The second need remains as urgent as ever *viz.*, the necessity of the continuance of a liberal book purchasing fund. Regarding this matter, I can do no better than reiterate the statement given in a previous report.

While the growth of the past few years is reasonably gratifying, the rate of growth must be accelerated if the library is to prove adequate to the needs of this rapidly growing university. While progress has been made, the library is still greatly inferior as a working library to those of many American universities with which The University of Wisconsin is proud to compare herself in equipment and work. It should be remembered that the growth of our library is of very recent date and that we have not the advantage possessed by many other university libraries of an extensive collection of books formed through many decades. This means of course that we are obliged to pay a much higher price for many important sets of books than it was necessary for these older libraries to pay. It is to be remembered also that from time to time the University has added new departments, such as those of the new Medical school, which have to be equipped from the ground up with expensive working collections in fields in which the University Library previously had little or nothing. All these elements combine to render the present book fund inadequate for the pressing needs of the various departments. With the present book fund, members of the faculty feel that we shall never catch up with our needs, and that a considerable increase in the annual book fund is therefore absolutely necessary. Next to an increase in the book fund, the permanency of amount is felt to be desirable. Such cuts in the book fund as have been necessary several times during the last few years, if repeated in the future, will greatly retard the orderly development of the Library. Hence an increased and permanent book purchasing fund seems to be the one great need of the library for the immediate future. The duty of a great library is both to provide adequately for the needs of the present generation and to build broadly for the future.

Respectfully submitted,

WALTER M. SMITH,

Librarian.

REPORT OF THE UNIVERSITY EDITOR

President Charles R. Van Hise,
The University of Wisconsin.

Dear Sir: I submit herewith the following report on the work of the division of publications for the biennial period ending June 30th, 1914.

PROGRESS

Monographs: During the biennium just closed there were issued fifteen monographs embodying the results of special investigation and research work. This is the same number issued during the preceding biennium and during only two previous biennial periods was there a greater number of monographs issued. On the whole the standard of the monographs has been good and there has been considerable call for these bulletins. Since July 1st, 1913, as the result of a change in the state printing law, all University bulletins have been charged directly to University funds instead of being charged to the general state fund, as was formerly the case. This does away with the necessity of sending manuscript to the Governor for approval and disposes of one possible cause of delay.

Bulletins in the Engineering Series are now published under the direction of a committee of the recently organized Engineering Experiment Station but the former series has been continued and there has been no change in style.

The following table gives the number of monographs published during each of the past bienniums:

From July 1st, 1892, to June 30th, 1894	8
From July 1st, 1894, to June 30th, 1896	13
From July 1st, 1896, to June 30th, 1898	7
From July 1st, 1898, to June 30th, 1900	11
From July 1st, 1900, to June 30th, 1902	7
From July 1st, 1902, to June 30th, 1904	8
From July 1st, 1904, to June 30th, 1906	8
From July 1st, 1906, to June 30th, 1908	22
From July 1st, 1908, to June 30th, 1910	25
From July 1st, 1910, to June 30th, 1912	15
From July 1st, 1912, to June 30th, 1914	15

General Series: This series, which includes the catalogue and all bulletins of a general nature, shows a decided increase. As in the previous biennium, the publications of the University Extension Division have furnished the greatest number of bulletins in the General Series.

High School Series: This series, comprising manuals for the use of teachers in secondary schools, has continued to be extremely popular. While there were no additions to this series during the past biennium it was found necessary to print new editions of three of these manuals.

Syllabi: The number of syllabi, laboratory notes, and other pamphlets for the use of students has materially increased, Nearly all of these are sold to the students, at cost, so that in the end the University is repaid for the cost of publication. This method of furnishing books to students is, I believe, a very good one so long as it is confined to publications peculiarly adapted to Wisconsin students, or to publications which are in preliminary form and not ready for publication as general texts.

Job Work: As in the past, there has been a steady increase in the amount of job work. This is a natural result of the growth of the University and the work may be expected to increase every year.

COST AND SERVICE

As I predicted in my last report, the cost of all state printing was increased with the contract which became effective January 1st, 1912. However, it is expected that the contract which becomes effective, January 1st, 1915 will bring about an improvement in this matter. The printing law, as revised by the last legislature provides for a sliding scale for certain kinds of work and while the cost of the small jobs will be somewhat higher the saving on the large jobs will more than counterbalance this.

I am glad to be able to report a continued improvement in the service furnished by the State Printer, both as to the quality of the printing and the time required to complete jobs. Naturally, with as many rush jobs as are necessary, it is impossible at times to give some of the work as close attention as would otherwise be possible. There is also bound to be delay at times. These delays are in some cases the fault of the printer, in some

cases the fault of the man ordering the work, and at certain times of the year they are the inevitable result of the congestion of printing.

QUARTERS

In the fall of 1913 the office of the University Editor was moved to the Administration Building. This is the logical location for the office but the present quarters are badly cramped and the work could be much more efficiently handled if larger quarters were provided.

Respectfully submitted,

O. C. GILLETT.
University Editor.

REPORT OF THE BUSINESS MANAGER

INCLUDING FINANCIAL STATEMENTS FOR THE YEARS 1912–13, 1913–14*

President Charles R. Van Hise,
The University of Wisconsin.

Dear Sir: Dr. Hermon C. Bumpus took office as Business Manager of The University of Wisconsin March 1, 1911, and resigned November 1, 1914, to accept the presidency of Tufts College.

While still in office, he prepared the material included in his biennial report, but with his resignation the duty of preparing the introduction to that report and superintending the completion and issuance of the material has devolved upon his temporary successor, the Acting Business Manager.

The Business Manager, as executive head of those officers and employes of the University that are not attached to the instructional force, is entrusted with the responsibility of supervising usiness affairs in accordance with the regulations of the Board of Regents and reports upon the following matters entrusted to him.

1. The General Receipts of the University
2. The General Expenditures of the University
3. Improvements in the Methods of Conducting University Business
4. Improvement of the Buildings
5. The Construction of New Buildings
6. The Improvement of the Grounds

* A complete statement of the receipts and expenditures of the University for the biennium has been issued as a special publication (Bulletin Number 705) which may be had by addressing the Business Manager, Madison, Wisconsin.

7. The Enlargement of the Grounds
8. The Enlargement of the Equipment
9. The Enlargement of the Endowment Funds
10. Treasure Balances

The General Receipts of the University

In order to simplify financial statements and to facilitate comparisons with other institutions, the receipts of the University are classified to correspond with the standard entries recommended by the Carnegie Foundation and are given in summaries on pages 356 and 357 for each of the years of the biennium.

Included in the financial transactions thus recorded are certain so-called "revolving funds", such as laboratory fees, dormitory receipts, etc. These are temporarily held by the State Treasurer, to be expended for the specific purpose for which received; but all these funds are not strictly comparable during both years of the biennium, as receipts from athletic games were handled by the Bursar as Treasurer of the Athletic Council during 1912–13. During 1913–14, under the law, this account was transferred to the State Treasurer. This change in the accounting system must be borne in mind in making comparisons between these two years of the biennium.

The General Expenditures of the University

The aggregate of all expenditures of the University from receipts of all kinds for 1912–13 amounted to $2,378,863.69; for 1913–14, $2,805,206.15. This includes all expenditures of athletic funds, dormitory receipts, expenditures for building and permanent improvements, as well as expenditures of receipts from the federal government from sales of agricultural produce, and receipts from students for tuition, incidental and laboratory fees.

Summaries of expenditures are given on pages 360 and 361 for the respective years and are so arranged as to conform to the general divisions of the University and to give general information regarding the character of these expenditures.

In general, disbursements are charged directly to the various divisions of the University as far as practicable; but items including expenditures for dormitories, restaurants, and improvements

of grounds, as well as all items of new construction and land purchases, are grouped under Division 20, "Physical Plant".

The cost of heat, light, water, repairs, and janitorial service is grouped under Division 20 during the year and properly apportioned among the several divisions in preparing the summaries of expenditures.

In considering these expenditures, it is well to bear in mind that the money used for instructional purposes at Madison represents only a portion of the total, and that the University, in addition to performing this instructional work, is also engaged in extension and control work* about the State of Wisconsin, as well as in research work for the advancement of knowledge in many fields.

Expenditures for all of these activities are included in the summaries of expenditures, which represent moneys received from all sources, including the amounts shown in the following tabulation for the two years in question:

	1912–13	1913–14
Receipts from Athletic Council	.....(1).....	$44,976.04
Receipts from produce sold (Agricultural College)	$124,369.70	141,652.80
Dormitory and dining hall receipts	79,539.76	131,897.49
Receipts from the Federal Government	80,000.00	80,000.00
Student tuition fees (net)	75,047.50	86,832.50
Student incidental fees (net)	165,947.73	180,897.16
Student laboratory fees (gross actual receipts)	76,000.23	85,293.85
Student gymnasium fees	5,497.60	6,238.05
Interest on investments	31,874.54	28,463.69
Received from gifts	10,745.17	12,721.14
Received from various sources	15,777.72	[2] 48,840.43
Total	$664,799.95	$847,813.15

[1] In 1912–13 funds of the Athletic Council were handled by the Bursar as Treasurer of the Athletic Council and receipts and expenditures are not included in the University summaries. In 1913–14, this account was, by law, transferred to the State Treasurer, and receipts and expenditures included in the University accounts.

[2] Receipts from "various sources" include University Extension receipts from lectures and concerts, which amounted to $1,254.80 in 1912–13 and $32,040.80 in 1913–14.

Deducting the above total of receipts ($664,799.95 for 1912–13 and $847,813.15 for 1913–14) from other sources than the State of Wisconsin, will leave a total expenditure of $1,705,194.23 for 1912–13 and $1,946,915.09 for 1913–14, received from the State of Wisconsin.

These expenditures include moneys expended for buildings,

* Dairy tests, nursery inspection, etc.

land, and such permanent equipment as books, apparatus, furniture, etc. ($583,338.27 for 1912–13 and $636, 887.23 for 1913–14), leaving an expenditure for operation and maintenance (repairs) of $1,121,855.96 in 1912–13, to which should be added an item of $15,176.31 for laboratory fees refunded, or a total of $1,137,032.27 for 1912–13. In 1913–14, these net operation and maintenance expenditures amounted to $1,310,027.86, to which should be added an item of $1,630.38 for laboratory fees refunded or a total of $1,311,658.24.

It will be noticed that in the twenty-one divisions of the summary, such items as Administration, General Library, Physical Education, etc., are kept separate. These are properly University Overhead expenses, and if these items (1, 2, 3, 4, 11, 12, 17, and 20) are properly apportioned to the various colleges and other activities, the following total charges for each of the years of the biennium are secured:

TOTAL EXPENDITURES OF MONEYS RECEIVED FROM THE STATE OF WISCONSIN FOR OPERATION AND MAINTENANCE.

	1912–13	1913–14
5. College of Letters & Science	$502,358.65	$550,051.17
6. College of Agriculture	233,713.45	321,432.98
7. College of Engineering	118,745.94	119,123.17
8. Law School	27,817.27	30,944.93
9. Medical School	32,727.50	37,711.82
10. School of Music	15,665.59	16,596.60
	$931,028.40	$1,075,860.67
13. Summer Session	19,915.32	21,865.18
14. University Extension	126,500.88	155,789.28
15. Agricultural Institutes	21,875.21	22,245.89
16. Hygienic Laboratory	8,994.11	10,473.25
18. Washburn Observatory	9,316.13	9,711.45
19. Forest Products Laboratory	6,823.22	6,374.03
21. Stores	12,579.00	9,338.49
Total	$1,137,032.27	$1,311,658.24

These totals check with the items previously given for these expenditures.

It will be noticed that the last seven items (Nos. 13 to 21 inclusive) represent other activities than those of regular two semester resident instruction, and if these are separated from the total, it is evident that the net cost to the state for all operation and maintenance expenditures for resident instruction, including in Agricultural charges, all expenses of State funds for research,

extension, and control, amounted in 1912–13 to $931,028.40 and in 1913–14 to $1,075,860.67.

If these expenditures are divided between such activities as (1) extension and control work; (2) research work; and (3) resident instruction, the division will appear as follows:

EXPENDITURES OF RECEIPTS FROM THE STATE OF WISCONSIN FOR OPERATION AND MAINTENANCE 1912–13

	Extension and control work	Research work	Resident instruction of two semester students
5. College of Letters & Science	.....	$115,000.00	$387,358.65
6. College of Agriculture	$93,378.81	64,704.53*	75,630.11
7. College of Engineering	.....	24,000.00	94,745.94
8. Law School	.....	4,500.00	23,317.27
9. Medical School	.....	13,000.00	19,727.50
10. School of Music	.....	.....	15,665.59
Totals	$93,378.81	$221,204.53	$616,445.06

Total expenditures, $931,028.40.

* The total expenditures of the College of Agriculture for research work in 1912–13 amounted to $113,203.60, of which $48,499.07 was received from other sources than the State of Wisconsin.

EXPENDITURES OF RECEIPTS FROM THE STATE OF WISCONSIN FOR OPERATION AND MAINTENANCE 1913–14

	Extension and control work	Research work	Resident instruction of two semester students
5. College of Letters & Science	.....	$125,000.00	$425,051.17
6. College of Agriculture	$139,972.07	75,454.83*	106,006.08
7. College of Engineering	.....	24,000.00	95,123.17
8. Law School	.....	5,000.00	25,944.93
9. Medical School	.....	15,000.00	22,711.82
10. School of Music	.....	.....	16,596.60
Totals	$139,972.07	$244,454.83	$691,433.77

Total expenditures, $1,075,860.67.

* The total expenditures of the College of Agriculture for research work in 1913–14 amounted to $127,179.19, of which $51,724.36 was received from other sources than the State of Wisconsin.

In this tabulation, the expenditures for research in the Agricultural College are determined from their accounting records. Research expenditures for other colleges are estimated conservatively, using all information available on the subject.

In attempting to obtain unit costs, it is necessary to bear in mind that students in the "short" and "dairy" courses are in at-

tendance only fourteen weeks instead of two semesters (approximately thirty-five weeks) or 40 per cent of the regular time.

If the registration of all two semester students is taken (4,237 in 1912–13 and 4,686 in 1913–14) and to this is added 40 per cent of the registration in the "short course" (431 in 1912–13 and 450 in 1913–14) and "dairy course" (154 in 1912–13 and 155 in 1913–14), and 40 per cent of the forest rangers course registration in 1913–14 of 28 students, a total registration of 4,471 in 1912–13 and 4,939 in 1913–14 full time (two semester) students is obtained, which, applied to the above computation for cost, would indicate an approximate average cost to the state for all operating and maintenance charges of two semester resident instruction amounting to $138.00 per student for 1912–13 and $140.00 for 1913–14.

If the total charge of state expenditures for research work, amounting to $221,204.53 in 1912–13 and $244,454.83 in 1913–14, is included in the cost of resident instruction to the State of Wisconsin, the total, or $837,649.59 in 1912–13 and $935,888.60 in 1913–14, will represent the net cost to the State of Wisconsin for all operation and maintenance charges due to resident instruction and research work. If this is charged entirely to resident students, it will represent an average unit cost of $187.00 in 1912–13 and $189.00 in 1913–14 for each student in attendance for two semesters.

Improvements in the Methods of Conducting University Business

The expenditures of the various divisions of the University for any year are estimated in advance and presented to the Regents. These estimates are thoroughly examined in detail and, when adopted by the governing board, constitute the budget, which becomes the authority for all routine expenses. All bills are approved by the Regents before being forwarded to the Secretary of State and to the State Treasurer for final audit and settlement.

The budget items connected with the academic, instructional, and scientific work of the University are prepared by the President, with the assistance of the Deans, Directors, and other educational officers, and the business details are prepared by the Business Manager. The salaries of the instructional staff and

of laboratory helpers form thus a distinct category of expense as contrasted with wages of employes, the cost of general maintenance and operation expenditures connected with the improvement of and addition to the buildings and grounds.

The accounting system of the Physical Plant Division has been improved during the past biennium by keeping accurate records of all expenditures in greater detail, thus affording ready means for the checking of expenditures with requisition estimates. Improvements have also been made in the grouping of requisition records, thus enabling a more expeditious handling of orders, and checking of requisitions against budget allowances.

The general utility needs of the University have been co-ordinated by changing the title of the Superintendent of Heating Plant to that of Consulting Engineer, with duties involving the electrical and other utility needs, as well as the heating and ventilating problems of the University, thus securing a greater co-ordination of the physical and educational needs and uses of steam, water, and electricity.

The greatest single improvement in the method of conducting University business has been secured by the new contract for electric current. The preparation of plans, estimates, etc., in studying these needs of the University and in arriving at the final solution occupied considerable time, but the results secured by the new contract, under which the University installed its own sub-station and distribution system, have been most satisfactory. The installation, as completed, represents an investment of $22,198.90 (estimate $23,000.00), and the saving to the University in the cost of electric current for the last biennium has exceeded this investment.

Under the terms of the contract, there is considerable advantage gained by reducing the peak load, and the co-operation of all members of the staff is regularly requested during the time of peak with most satisfactory results. By changing carbon lamps to tungsten lamps and making other improvements in the illumination of the buildings, it has been possible to keep the peak down and thus secure considerable economy.

With the increased buildings and increasing use of electric current for ventilating fans and laboratory use, the quantity of electric current consumed has naturally increased, but in spite of this the total bill for electric current has been greatly reduced.

Improvement of the Buildings

The various schedules under Column E of the summaries give the details of all expenditures for the improvement of the various properties of the University. The principal improvements to be mentioned are: new roof on North Hall, South Hall, and Agricultural Hall; the painting of University, North and South Halls; the addition of twelve showers and eighty dressing rooms in Lathrop Hall; and changes in the basement of Music Hall to permit the construction of a number of practice rooms.

Other minor improvements have been made to a number of buildings to meet changing conditions and requirements of various departments.

The Construction of New Buildings

During the biennium, the following buildings were completed: the clinical laboratory was occupied in November, 1912, and offers greatly needed facilities for the medical examination of students. The west wing of the Chemistry Building was completed in March 1913 and occupied in the following September. Barnard Hall, the women's dormitory, was entirely constructed during the biennium, being completed in June, 1913, and occupied in the opening semester of October. The Home Economic and University Extension Building was begun in 1912 and completed in 1914. The Agricultural Chemistry Building was also started in 1912 and finished in 1913. The Wisconsin High School was begun in July 1913 and occupied in September 1914. In addition, a number of small buildings have been erected for the College of Agriculture, including the laboratory for the production of hog cholera serum, two hog barns, a plant pathological greenhouse, fireproof stack room adjoining the Agricultural Sub-stations located at Ashland, Spooner, and Marshfield. In addition to this, the northwest wing of the State Historical Library was put under construction in July 1912 and occupied in September 1914.

The Improvement of the Grounds

Considerable progress has been made in improving the grounds of the University by making the drives of a far more permanent character, using cement on many of the steepest drives of the

upper campus and materially improving the appearance of the University grounds, particularly on the Park Street and University Avenue approaches.

The Enlargement of the Grounds

Payments have been made on Eagle Heights Farm under the action of the legislature, leaving one payment to be made in the first year of the coming biennium. Over $100,000 ($101,800) has been expended for some fourteen parcels of land, principally city lots, and including a sixty acre addition to the Hill Farm of the University.

With these purchases and the options which have been secured during this biennium, the University is gradually acquiring control of the available contiguous property between University Avenue and Linden Drive, an investment whose value will increase materially with the growth of the University.

The Enlargement of the Equipment

At the beginning of the biennium, a combined value of the University inventory as recorded by the Secretary was $1,156,115.09, July 1, 1912. The corresponding value June 30, 1914, was $1,369,741.93, an increase during the biennium of $213,626.84. This represents books, apparatus, furniture, machinery, tools, and live stock.

Column F of the summaries will indicate the entire capital expenditures of each year, which are shown in detail in succeeding schedules.

The Enlargement of the Endowment Funds

The invested funds of the University are comparatively small. These are shown in Schedules P–1, Q–1, and Q–2. On July 1, 1912, the reserve fund consisted of the following:

"University Fund"	$232,796.50	
"Agricultural College Fund"	303,594.61	
University Trust Funds	129,493.78	
		$665,884.89

On June 30, 1914, the funds were as follows:

"University Fund"	$232,701.50	
"Agricultural College Fund"	303,594.61	
University Trust Funds	142,788.60	
		679,084.71
Increase for the biennium		$13,199.82

In addition to the permanent funds of the University, a number of smaller donations are frequently given for designated purposes, and these gifts are frequently renewed from year to year.

Treasure Balances

The letter of the State Treasurer, given on page 358, gives an outline of the transactions that have taken place in his office so far as they affect the University, and shows a balance in the University Fund Income, June 30, 1914, of $307,220.91, exclusive of building appropriations. The legislature of 1913 put the University strictly on an appropriation basis, setting aside the balance, June 30, 1913, of ($274,783.52), and all moneys belonging to University Fund Income by reasons of appropriations in force at that date are made available to the Board of Regents of the University for carrying out the purposes for which such appropriations were made and for the payment of indebtedness incurred prior to July 1, 1913; and also providing that money not required for either of these purposes shall be available on and after July 1, 1913 to meet appropriations made from the University Fund Income, and providing that on July 1, 1914, the balance then remaining should be available for operating expenses for the fiscal year beginning July 1, 1914. This balance July 1, 1914, amounted to $120,211.56, the reduction being due to expenditures of money for purchase of land.

Respectfully submitted,

H. J. Thorkelson,

Acting Business Manager.

REPORT OF THE CONSULTING ENGINEER

President Charles R. Van Hise,
The University of Wisconsin.

Dear Sir: I beg leave to submit the following brief report regarding the operation of our Central Heating Station for the last biennium, together with a report covering the electric substation for the same period.

The following table will indicate the buildings heated from the central station during each year since 1906–07, the total cubical contents of these buildings and the square feet of direct and indirect radiation connected to our distribution system.

The indirect radiation takes about four times as much steam per hour as the direct, but as it is in use for only eight hours instead of twenty-four, we consider its operating cost equivalent, in terms of direct radiation is practically as 1⅓ is to 1, with the results indicated in the summary.

BUILDINGS HEATED, 1906-07

Name	Cubical contents	Sq. ft. direct radiation	Indirect radiation
University Hall	682,500	4,632	2,000
South Wing, U. H.	518,320	5,000	2,000
North Hall	331,655	1,590	1,440
South Hall	331,655	2,454	450
Chadbourne Hall	1,113,600	9,933	.....
Music Hall	780,000	1,909	224
Science Hall	1,751,310	11,488	929
Chemical Engineering Building	450,000	4,284	399
Engineering Shops	865,125	1,689	533
Mining Laboratory	240,700	440	280
Engineering Building	746,144	7,426	1,048
Law Building	401,625	2,625	1,320
Administration	93,400	1,256	.....
President's House	130,370	998	750
Chemistry Building	1,420,400	10,084	4,204
Agricultural Hall	1,014,000	8,832	1,893
Dairy Building	300,000	553	791
Soil Physics	247,500	1,855	.....
Old Greenhouse	37,500	3,387	.....
Gymnasium	1,640,500	1,840	4,762
Library	1,933,000	15,579	4,785
Pumping Station	60,000	295	.....
Dairy Power House	90,000	350	.....
Total	15,179,304	98,499	27,808

BUILDINGS HEATED 1907-08

1906-07	15,179,304	98,499	27,808
North Wing U. H.	518,320	5,000	2,000
Agricultural Engineering Building	345,000	3,721	2,169
Agronomy Building	193,536	2,627	1,240
Hydraulic Laboratory	211,680	1,934	.....
Total	16,447,840	111,781	33,217

BUILDINGS HEATED 1908-09

1907-08	16,447,840	111,781	33,217
Central Heating Plant	1,011,900	1,876	1,500
Dean of Agriculture	92,400	680	350
Total	17,552,140	114,337	35,067

BUILDINGS HEATED 1909-10

1908-09	17,552,140	114,337	35,067
Lathrop Hall	1,476,000	7,246	7,578
Prof. Humphrey	50,400	400	150
Stock Pavilion	1,260,000	2,823	2,040
Total	20,338,540	124,806	44,835

BUILDINGS HEATED 1910-11

1909-10	20,338,540	124,806	44,835
Engineering Wing	301,815	2,248	600
U. W. Physician	47,400	570	.....
Utility Shops	297,375	2,142	.....
Forest Products	573,600	4,744	.....
Dairy Laboratory	144,337	1,803	.....
Greenhouse	169,464	4,152	.....
Warren Street House	45,000	480	.....
Total	21,917,531	140,945	45,435

BUILDINGS HEATED 1911-12

1910-11	21,917,531	140,945	45,435
One-half Biology	599,225	4,623	2,385
New Horticultural	325,639	2,607	685
One-half Gymnasium Annex	154,556	1,000	.....
Total	22,996,951	149,175	48,505

BUILDINGS HEATED 1912-13

1911-12	22,996,951	149,175	48,505
One-half Biology	599,225	4,623	2,385
One-half Gymnasium Annex	154,556	1,000	.....
Clinical Building	112,400	1,900	.....
Chemistry Wing	545,232	6,212	.....
One-third Barnard	215,894	2,000	.....
Greenhouse Addition	17,600	626	.....
Total	24,641,858	165,536	50,890

BUILDINGS HEATED 1913-14

1912-13	24,641,858	165,536	50,890
Two-thirds Barnard	431,789	4,108	.....
Home Economics	746,232	7,078	Ind. of 1,224 not used
Agricultural Chemistry	658,249	5,121	720
Two-thirds Wisconsin High School	599,385(+299,943)	5,686 (+2,844)	346 (+172)
Total	27,078,013	187,529	51,956

SUMMARY

Year.	Sq. ft. direct radiation.	Sq. ft. indirect radiation.	Total equivalent direct radiation.	Total cost of "heat and water."
1906-07	98,499	27,808	135,576	$78,487.65
1907-08	111,781	33,217	156,070	61,476.74
1908-09	114,337	35,067	161,093	72,427.15
1909-10	124,806	44,835	184,586	79,195.15
1910-11	140,945	45,435	201,525	108,529.66
1911-12	149,175	48,505	213,848	108,611.10
1912-13	165,536	50,890	233,389	97,959.30
1913-14	187,529	51,956	256,803	94,294.34

In order to determine the cost of heating, it is necessary to separate the heating cost from the cost of steam for other purposes. After considering these items in detail, the following Table of Unit Costs has been prepared, showing in the last column the cost per equivalent square foot of direct radiation for each of the last eight years:

TABLE OF UNIT COST

Year.	Ratio heating demands to total steam demands.	Total cost of heating.	Cost per equivalent sq. ft. d. rad.
	%		
1906-07	65	$51,000.00	$.377
1907-08	67.5	41,000.00	.265
1908-09	67.7	49,000.00	.304
1909-10	70	55,000.00	.300
1910-11	71	77,000.00	.382
1911-12	71	77,100.00	.361
1912-13	72	70,500.00	.305
1913-14	71	67,000.00	.262

The high cost of 1910-11 is largely due to the coal strike of the Illinois coal field, which compelled the purchase of a large quantity of coal from the docks at Milwaukee at a higher cost,

and in addition to this, the coal in the University bins caught on fire, resulting in a most serious loss of coal and attendant high cost of fighting the fire, which continued for weeks. The results on the whole are quite gratifying. The improvement in costs of the last biennium is largely due to improvements which have been made during these years in the operation of the plant and to changes in the distribution system. The moderate weather of the last winter is also reflected in the unusual low unit cost.

Possibly the greatest single gain in operation is due to the new high pressure line in the tunnel from the Heating Station to the Pump House, enabling us to put our larger heating mains on a lower pressure, with a resultant reduction in radiation loss.

This change, which cost approximately $12,000, enables us to utilize *all* the exhaust steam available at the engines over the entire University heating system instead of over a small portion as in previous years. This also enables us to maintain a higher temperature of return water to our boilers, with the resultant increased evaporation per pound of coal.

In constructing the new buildings, we have attempted to keep in touch with the latest developments in ventilation. Lathrop Hall has perhaps the most powerful ventilation system of any of the University buildings, but our new Wisconsin High School represents a much greater advance in that our ventilating system is arranged to recirculate the air and wash it, thus removing odors and bacteria, humidifying the air and saving the usually enormous heat loss in cold weather, attendant upon the older systems of heating air and blowing it through rooms and out of doors.

Another very decided improvement which has been recently made at the central station has been the development of a flat arch over the furnaces. This was tried experimentally one year on boiler No. 5 and we have every confidence that the cost of furnace repairs will be reduced to less than 1/3 of the former figure. The furnace design is largely the work of our chief operating engineer, Mr. J. M. Smith, and is resulting in increased economy and better combustion, in addition to the increased advantage of longer life and reduced repair cost.

Considerable improvement has been made during the past biennium in supplying the electrical needs of the University.

In the summer of 1912 a contract was made with the Madison Gas and Electric Company which has resulted not only in a large saving to the University, but also in a more efficient and reliable distribution of electric current for light and power to the different buildings.

By the terms of this contract electrical energy is delivered to the University at the Heating Station over a separate feeder extending from the company's power station, and the distribution from this point is taken care of by the University over its own lines. $22,198.90 (estimate $23,000.00) was expended in constructing an electrical sub-station in the Heating Station, in equipping this sub-station with a switchboard and machines, and in installing a distributing system on the grounds.

The following table gives the cost of electrical energy to the University for the last four fiscal years. (This includes some charges for gas for lighting purposes, which can not be easily separated from the accounts.)

Fiscal year	Cost of electrical energy	Saving over 1911–12
1910–11	$24,347.66	
1911–12	27,650.26	
1912–13	18,854.39	$8,795.87
1913–14	19,245.92	8,404.34
		$17,200.21

The saving shown above is all the more remarkable when it is considered that the following new buildings were added during the last biennium:

Biology Building
Barnard Hall
Clinical Laboratory
Agricultural Chemistry Building
West Wing of the Chemistry Building, and the
Home Economics and University Extension Building.

It is estimated that the saving, if computed on the basis of the cost of electric current in 1911–12, has, during the last biennium, exceeded the total investment. Credit for the success of the installation and operation is due to Professor John R. Price.

A further comparison of the quantity of electric current con-

sumed during each of the last five fiscal years and the approximate average price paid per Kilowatt hour is indicated in the following table:

Fiscal year	Kilowatt hour	Approx. aver. price per kilowatt hour paid to Madison Gas & Elec. Co.
1909–10	315,407	$.0593
1910–11	414,379.5	.0588
1911–12	421,040.5	.0564
1912–13	587,679	.0239
1913–14	753,200	.0182

The new sub-station went into operation about the first of November, 1912, and its full effect on unit cost is evident in the report for 1913–14. This new contract required additional expense on the part of the University by reason of sub-station attendance, etc., and these expenses are all included in the table showing the total cost of electrical energy.

One of the difficult situations to be met is found in the large number of 500 volt direct current motors about the University. The cost of changing all of these at one time is prohibitive, but we have, during the past year, changed the motors at the Central Heating Station, Service Building, and Chemistry Building from direct current to alternating current, with a saving of fully 20 per cent in the current consumed at these points. This enables us to supply increasing demands for current for power without increasing the capacity of our motor generator sets at the sub-station.

We hope, in the near future, to extend the alternating current power line as far as the pumping station, and gradually substitute alternating current for direct current power.

A great deal of work has been done in preparing plans and estimates for a steam generating plant arranged to use all of the steam required for heating purposes in generating electric current of a quantity fixed by the heating demands for steam.

This problem presents a great many complications, but if we are successful in securing a market for this electric energy, we will probably succeed in reducing still further the cost of heat and electric current to the University.

Respectfully submitted,

H. J. THORKELSON,

Consulting Engineer for the University.

REPORT OF THE ARCHITECT

President Charles R. Van Hise,
The University of Wisconsin.

Dear Sir: In reply to your request I submit the following description of the buildings occupied during the biennium just past:

The Athletic Annex occupied in January, 1912, may be included in the list, although I believe it was constructed from previous appropriations. This building, located north of the Men's Gymnasium, consists of a single room for athletic practice, 82 feet wide by 190 feet long, and has a total area of 17,000 square feet including entrances. The building is faced with red brick and is supported by steel trusses. The earth floor is arranged for a running track and ball field. The cost of construction was $15,000.00, about 5 cents per cubic foot.

The Clinical Laboratory, occupied in November, 1912, consists of two parts,—the old portion, previously known as the Olin House, and a new portion 36 feet wide by 68 feet long containing a basement and first story. Old and new portions together comprise a floor area of 8,500 square feet. The cost of the new part was $12,100 or 19.8 cents per cubic foot. This is faced with red brick and has concrete floors, sound proof partitions, etc., forming a series of consultation rooms for medical examination of students.

The Biology Building was occupied in August, 1912. This building comprises a main portion 49 feet wide by 240 feet long, including basement, ground floor and four stories; together with an auditorium portion 74 feet by 50 feet in size, containing a sub-basement, basement, first and second floors. The floor area of the entire building exclusive of the green-

houses is 80,000 square feet. The cost of construction was $200,000 or 16.7 cents per cubic foot. The building is faced with Madison sandstone and the construction is fireproof in character. The building, while in the same general style as University Hall, has a rather more severe architectural treatment. The main entrance on the north opens into a large foyer in which are exposed Biological specimens of general interest. From the foyer stairways lead to the various parts of the building and from it also, access is obtained to the auditorium, seating about 400. The other portions of the building are divided into laboratories, class rooms, offices and work rooms of various sizes. A photographic gallery is constructed in the roof space. Beneath the auditorium, the laboratories open directly into greenhouses of considerable extent, divided into sections for the various branches of botanical study. Adjacent to the laboratories in the east wing is a vivarium of glass and iron for the cultivation of zoological specimens. It is intended at a future time to add wings on the east and west of this building as required.

The West Wing of the Chemistry Building was completed in March, 1913, and occupied in the following September. The portion facing on University Avenue is 110 feet long by 51 feet wide and contains a basement and four stories of chemical laboratories. A wing is extended also along Charter Street a distance of 92 feet, with a width of 48 feet, basement and one story high. The laboratory on the first story extends through the entire north and south length of the building, 143 feet by 48 feet, and is considered unusually large for a single laboratory. The building area is 30,000 square feet. The cost was $72,150 or 13.2 cents per cubic foot. This building is faced with buff vitreous brick with cut stone trimmings and is constructed with concrete floors, tile partitions and concrete roof. It constitutes the first finished portion of the Chemistry Building and indicates the style in which the building will be carried out.

Barnard Hall is the first building entirely constructed during the biennium, 1912 to 1914, being begun in March, 1912, and completed in June, 1913. It consists of a central portion, running north and south with wings extended eastward and enclosing a paved court with balustrades and steps down to

the lawn. The building comprises four stories of dormitories and an attic story for the accommodation of help. The cost was $123,500 or 19.07 cents per cubic foot. The total floor area is 35,000 square feet. It also is faced with Madison stone, constructed with fireproof floors and covered with tile roof. While the building conforms to the University style of architecture, it is more charming and informal in treatment. The rusticated stone work and the detail of the cornice gives an added interest and corresponds to the domestic character of the interior. There are 140 dormitory spaces of which 133 are rented to students, the others being used for the matron's suite and general requirements of the building. On the first floor are the parlors and in the basement the dining rooms, serving rooms, trunk rooms and other utilities. The building is connected to the Central Kitchen, which supplies also Chadbourne Hall and Lathrop Hall dining rooms. The interior is finished in a simple dignified manner, and is equipped with a passenger elevator.

The Home Economics and University Extension Building, located between University Hall and Agricultural Hall on Linden Drive, was begun in 1912 and completed in March, 1914. It consists of a central portion 100 feet long by 58 feet wide with one wing on the east 49 feet by 92 feet in dimensions. It contains 50,000 square feet of floor area. The cost was $119,000 or 15.9 cents per cubic foot. The building is faced with buff vitreous brick with Bedford stone trimmings. The visible portions of the roof are covered with tile. The central portion is used by the Department of University Extension; the east wing contains the Department of Home Economics, which occupies also the third and fourth stories of the central portion. Like the other buildings recently constructed, this is of fireproof materials, with concrete floors and tile partitions. Provision is made for future extension by a wing on the west. The building presents an excellent appearance and has a commanding position, which will be further improved by the future development of drives and streets connecting with University Avenue.

The Agricultural Chemistry Building was started also in 1912 and finished in December, 1913. It consists of a central portion 108 feet by 65 feet in dimensions fronting on Univer-

sity Avenue, with a wing 134 feet by 52 feet facing on the Lesser Mall. The building is basement and two stories high and has a floor area of 30,000 square feet. The cost was $83,363 or 12.66 cents per cubic foot. The architectural treatment and the materials of construction correspond with the Agronomy and Agricultural Engineering Buildings, immediately north. Like them, it is of fireproof construction with concrete floors and tile partitions. The roof is covered with tile. Future extension of this building is provided for by a wing on the west corresponding to that fronting on the Lesser Mall. The building is devoted to laboratories and offices and contains a chemical lecture room with a seating capacity of about 350. The attic over the wing has been finished off into practicable rooms for the work of the department. This completes the group on the west side of the Lesser Mall and forms the eastern limit of the College of Agriculture.

The Wisconsin High School was begun in July, 1913, and occupied in September, 1914. It is located on the east side of the Lesser Mall at the intersection with University Avenue, and is the first building in the Group of Applied Sciences. The building consists of a main portion facing west, 44 feet by 90 feet, containing three stories and basement. East of this is the auditorium and gymnasium portion 48 feet by 74 feet in size, and on University Avenue the south wing 44 feet by 103 feet in size, three stories, basement and attic in height. The cost was $118,828 or 13.25 cents per cubic foot, and the total floor area is 40,000 square feet. The building is constructed of buff vitreous brick with stone trimmings, concrete floors, fireproof partitions, iron stairways, and concrete roof. The visible portion of the roof is covered with tile. The building is divided into class rooms and offices and contains in the basement, manual arts laboratories and drawing room, shower and dressing rooms and gymnasium; in the first and second stories, lecture rooms are provided for students in the Department of Education. These overlook class rooms to right and left, which enables students to witness the actual work of teaching. The gymnasium is overlooked by a gallery where the management and operation of the gymnasium classes can be studied. On the second floor is the auditorium or assembly hall with a seating capacity of 360. The third floor is occupied by labora-

tories for Home Economics, Biology, and Chemistry with the lecture room, store rooms, dark rooms, etc. The attic is used for games, lunches, and social activities incident to the school. Space is provided on the north of the building for a wing similar to that facing on University Avenue.

This completes the number of University buildings of large size occupied during the last biennium.

In addition to these are a number of small buildings for the College of Agriculture, including a laboratory for the production of hog cholera serum, constructed at a cost of $2,083.00; two Hog Barns for Experimental Work, at $5,085.00; a Plant Pathology Greenhouse adjacent to the Horticultural Greenhouse, at $1,649.00; a fireproof Book Room adjacent to Agricultural Hall, at $4,444.00. Also Agricultural Station Buildings in various parts of the state as follows:

ASHLAND

Office, at a cost of	$1,540.00
Cottage, at	2,000.00
Summer Cottage, at	400.00
Barn, at	1,500.00
Machine Shop, at	350.00
Drying Shed, at	200.00

SPOONER

Main Building, at (Office and Storehouse)	1,800.00
Foreman's Cottage, at	1,728.50
Stock Barn, Silo and Machine Shed A, at	1,800.00
Machine Shed B, at	550.00
Potato Cellar, Concrete, at	1,621.00

MARSHFIELD

Dwelling No. 1, at	500.00
Dwelling, No. 2, and office, at	600.00
Barn No. 2, at	1,360.00

There were constructed also two buildings in the Service Department consisting of the Electric Sub-station in the Central Heating Station, costing $927.00; the Central Kitchen adjacent to Chadbourne, Barnard, and Lathrop Halls, costing $10,975.00, from which the dining rooms in these halls are supplied with cooked food.

The northwest wing of the State Historical Library was put under construction in July, 1912, and occupied in September,

1914. The dimensions of this building are 66 feet by 56 feet. It consists of a basement and six tiers of book stacks, above which is a museum. The building has a floor area of 20,000 square feet. The cost was about $65,000, or 23c per cubic foot, exclusive of book shelves, electric lighting, stairs, elevators, etc. The building is faced with Bedford stone and constructed with steel beams and tile floors in the most approved fireproof manner. The architectural treatment corresponds with the general style of the present building.

In the design and construction of buildings undertaken during the past two years, the intention of the general design has been studiously followed especially as regards architectural treatment and the materials of construction. Buildings located on the eastern portion of the University grounds have been faced with Madison stone and made to harmonize with the rather free Italian style of the existing buildings, and at the same time have been given such variety as desirable. In buildings located further west, the same color scheme and architectural design has been conserved at somewhat lower cost by the use of buff vitreous brick with stone trimmings. In the Agricultural Department brown brick and Bedford stone have been adopted as fulfilling all aesthetic requirements in a harmonious and economical way. In the construction of these buildings due regard has been given to wise expenditure of money without sacrificing durability or fireproof character. In interior finishing and fittings the use of wood has been steadily diminished in favor of more durable and less expensive materials so that at present the buildings represent a practical minimum as to cost. This has been demonstrated in the contract prices of the several buildings where substantial value has been secured without increase of expense and that in the face of an increase in the price of labor and materials throughout the country.

Respectfully submitted,

ARTHUR PEABODY,

Architect.

APPENDIX A

The Attendance at The University of Wisconsin

1. NUMBER OF STUDENTS DURING THE PAST TEN YEARS

	04-05	05-06	06-07	07-08	08-09	09-10	10-11	11-12	12-13	13-14
Letters and Science[1]	1,443	1,547	1,542	1,705	1,865	2,150	2,379	2,409	2,420	2,613
Course in Pharmacy	33	32	37	32	44	42	47	38	42	40
School of Music	153	209	191	150	114	143	[2]74	74	76	95
Medical School	.....	.....	.....	25	32	49	47	57	66	82
Mechanics and Engineering	804	768	799	921	896	781	807	728	678	738
Agriculture (Long)	87	143	150	160	215	277	402	508	579	682
Agriculture (Middle)	.....	.....	.....	.....	35	74	100	101	107	135
Short and Dairy Courses	439	485	472	534	609	561	611	557	585	605
Forest Rangers' Course	.....	.....	.....	.....	.....	.....	.....	.....	[3]11	28
Home Economics	.....	.....	.....	.....	.....	52	100	134	165	205
Law School	183	154	165	157	165	159	148	158	167	169
Library School	[3]59	[3]51	[3]71	[3]42	[3]22	[3]30	29	34	36	43
Summer Session	403	528	568	661	1,026	1,128	1,263	1,537	1,746	2,132
Less twice enumerated	[4]203	[4]295	[4]265	[4]332	[4]480	[4]469	[4]468	[4]587	[4]697	[4]802
Totals	3,342	3,571	3,659	4,013	4,521	4,947	5,539	5,748	5,970	6,765

[1] This includes the courses in commerce, chemistry, journalism, normal course, and the training of teachers. These courses are so interwoven with the other courses of the College of Letters and Science that they cannot well be separated.

[2] This apparent decrease in the number of music students is due to a different method of classification.

[3] Not included in the totals.

[4] This large number is due to the fact that many persons who were present at the summer session were also present in the regular sessions of the University.

2. NUMBER OF THE INSTRUCTIONAL FORCE

	04-05	05-06	06-07	07-08	08-09	09-10	10-11	11-12	12-13	13-14
Professors	69	78	80	85	91	98	102	101	100	100
Associate Professors	8	9	9	13	17	22	32	40	45	51
Assistant Professors	38	45	48	59	70	76	93	110	111	112
Lecturers[6]	.....	.....	.....	.....	.....	.....	.....	.....	21	20
Instructors	96	113	119	119	129	137	155	180	198	213
Assistants[7]	44	47	71	84	97	121	135	150	149	155
Fellows[5]	[3]13	[3]14	[3]18	[3]16	[3]16	[3]16	[3]21	[3]22	[3]21	[3]21
Totals	255	292	327	360	404	454	517	581	624	651

[5] The university fellows, though primarily students, are classified here for the reason, that, according to the terms of their appointment, they are required to render a small amount of instruction. This requirement, however, applies only to the University fellows; consequently the above enumeration does not include the fellows provided for by private generosity.

[6] Lecturers give part time service and are classified separately for the first time in 1912-13.

[7] Assistants average half time.

Changes in the Faculty

During the fiscal year, July 1, 1912 to June 30, 1913

APPOINTMENTS

Professors

Name.	Title.
BETTS, HAROLD S., M. E.,	Lecturer in Forest Products.
CORP, CHARLES IVES, M. S.,	Assistant Professor of Hydraulic Engineering.
GILLIN, JOHN L., Ph. D.,	Associate Professor of Sociology. Secretary, Department of General Information and Welfare, Extension Division.
HAMILTON, FREDERICK RUTHERFORD, Ph. B.,	District Representative, Extension Division.
HIBBARD, BENJAMIN HORACE, Ph. D.,	Professor of Agricultural Economics.
HOWARD, ROBERT FRANCIS, B. S., M. A.,	Assistant Professor of Horticulture.
HUMPHREY, CLARENCE JOHN, B. A. B. S. C.,	Lecturer in Plant Pathology.
JAMES, ELDON R., S. J. D.,	Professor of Law.
JUNEAU, WILLIAM JOSEPH, B. A.,	Assistant Professor of Physical Education.
KUEHNEMANN, EUGEN, Ph. D., Litt. D.,	Carl Schurz Memorial Professor.
LEWIS, IVEY FOREMAN, Ph. D.,	Assistant Professor of Botany.
LINDHOLM, SVANTE, B. L.,	Lecturer in Education.
MELVILLE, ANDREW H., Ph. B.,	District Representative, Extension Division.
MILLER, HARRY LLOYD, B. A.,	Assistant Professor of Education. Principal, Wisconsin High School.
MOODY, FRANK BENJAMIN, M. S. F.,	Assistant Professor of Forestry.
O'CONNOR, JOHN PEASLEE,	District Representative, Extension Division.
PALMER, ROBERT CONRAD, B. S., Ch. E.,	Lecturer in Forest Products.
PEARSE, ARTHUR SPERRY, Ph. D.,	Assistant Professor of Zoology.
SINZHEIMER, LUDWIG, Ph. D., Dr. Pol. Econ.,	Acting Professor of Political Economy.
STEVENS, THOMAS WOOD,	Lecturer in Fine Arts.
TRILLING, BLANCHE M.,	Director of Women's Gymnasium. Assistant Professor of Physical Education.
VARNUM, WILLIAM HARRISON,	Assistant Professor of Drawing and Design.
WRIGHTSON, PHILIP G., M. S.,	Commandant. Professor of Military Science and Tactics.

PROMOTIONS

Professors

BLACKWELDER, ELIOT, B. A.,	From Associate Professor to Professor of Geology.
BURKE, LAURENCE CHARLES, B. L.,	From Library Assistant to Assistant Librarian.
CAMPBELL, OSCAR JAMES, Ph. D.,	From Instructor to Assistant Professor of English.
CERF, BARRY, Ph. D.,	From Assistant Professor to Associate Professor of Romance Languages.
CODDINGTON, HESTER,	From Head Cataloguer to Assistant Librarian.
DRESDEN, ARNOLD, Ph. D.,	From Instructor to Assistant Professor of Mathematics.
HOOL, GEORGE ALBERT, B. S.,	From Assistant Professor to Associate Professor of Structural Engineering.
KLEIN, DAVID, Ph. D.,	From Instructor to Assistant Professor of Chemistry.
NORRIS, EARLE B., M. E.,	From Assistant Professor to Associate Professor of Mechanical Engineering.
OTTO, MAX CHARLES, Ph. D.,	From Instructor to Assistant Professor of Philosophy.
OVERTON, JAMES BERTRAM, Ph. D.,	From Assistant Professor of Botany to Associate Professor of Plant Physiology.
PITMAN, ANNIE MARIE, Ph. D.,	From Instructor in Greek and Latin to Assistant Professor of Latin.
REGAN, ALICE,	From Instructor to Assistant Professor of Music.
ROEBUCK, JOHN RANSOM, Ph. D.,	From Instructor to Assistant Professor of Physics.
SAMMIS, JOHN LANGLEY, Ph. D.,	From Assistant Professor to Associate Professor of Dairy Husbandry.
SHUMACKER, LEOPOLD, Ph. B., M. D.,	From Instructor to Assistant Professor of Clinical Medicine.
SMITH, CHARLES AUGUSTUS, M. A.,	From Instructor to Assistant Professor of History.
SMITH, KENNETH GARDNER, B. A., B. S.,	From Assistant Professor to Associate Professor of Mechanical Engineering. District Representative, Extension Division.
STARCH, DANIEL, Ph. D.,	From Instructor to Assistant Professor of Psychology and Education.
WEISS, HOWARD FREDERICK, Ph. B.,	From Assistant Director to Director, Forest Products Laboratory.

CHANGES IN TITLE

Professors

HART, EDWIN BRET, B. S.,	From Professor of Agricultural Chemistry to Professor of Agricultural Chemistry and Chemist to the Experiment Station.
NEYSTROM, PAUL HENRY, Ph. M.,	From Assistant Professor of Political Economy and District Representative, Extension Division to Assistant Professor of Political Economy, Extension Division.

Changes in the Faculty

During the fiscal year, July 1, 1913 to June 30, 1914

APPOINTMENTS

Professors

AMES, JESSE H., Ph. B.,	District Representative, Extension Division.
BALLANTINE, HENRY WINTHROP, B. A., LL. B.,	Professor of Law.
BARROWS, EDWARD MORLEY, B. A.,	District Representative, Extension Division.
BATEMAN, ERNEST, Ph. B.,	Lecturer in Forest Products.
COOK, ARTHUR MAYHEW, B. A., M. F.,	Associate Professor of Forestry.
DEARHOLT, HOYT E., M. D.,	Director, Bureau of Health Instruction, Extension Division.
DUDLEY, WILLIAM H.,	In charge of Bureau of Visual Instruction, Extension Division, Extension Lecturer in Ornithology.
DYKEMA, PETER WILLIAM, M. L.,	Professor of Music.
FRED, EDWIN BROUN, Ph. D.,	Assistant Professor of Agricultural Bacteriology.
HOPKINS, ANDREW W., B. L.,	Agricultural Editor. Professor of Agricultural Journalism.
HORNBECK, STANLEY KUHL, Ph. D.,	Assistant Professor of Political Science.
KEITT, GEORGE WANNAMAKER, M. S.,	Lecturer in Plant Pathology.
KINGMAN, EDWARD DYER, Ph. B.,	Assistant Professor of Railway Engineering.
LESTER, CLARENCE B., M. A.,	Department of Special Legislative Reference Library Training.
McCAFFERY, RICHARD STANISLAUS, E. M.,	Professor of Metallurgy.
MILLER, EMERSON R., Ph. C., M. S.,	Acting Assistant Professor of Plant Chemistry. Chemist to Pharmaceutical Experiment Station.
MOORE, BLAINE FREE, Ph. D.,	Lecturer in Political Science.
O'NEILL, JAMES MILTON, B. A.,	Associate Professor of Rhetoric and Oratory.
SCHMIT, CELESTINE,	Assistant Professor of Home Economics.
TEESDALE, CLYDE H., B. S.,	Lecturer in Forest Products.
TIEMANN, HARRY DONALD, M. E., M. F.,	Lecturer in Forest Products.
VANDERVORT, LYNETTE McNIEL,	Mistress of Barnard Hall.
WOODBERRY, GEORGE EDWARD, L. H. D., LL. D.,	Lecturer in English Literature.

PROMOTIONS

Professors

BEACH, BURR A., D. V. M.,	From Instructor to Assistant Professor of Veterinary Science.
BENNETT, EDWARD, E. E.,	From Associate Professor to Professor of Electrical Engineering.
BRADLEY, HAROLD CORNELIUS, Ph. D.,	From Assistant Professor to Associate Professor of Physiological Chemistry.
BRANDT, JOSEPH GRANGER, Ph. D.,	From Instructor to Assistant Professor of Latin.
BUTLER, RALPH STARR, B. A.,	From Assistant Professor of Business Administration to Associate Professor of Business Administration and Lecturer in Journalism.
CHRISTIE, ALEXANDER GRAHAM, M. E.,	From Assistant Professor of Steam Engineering to Associate Professor of Steam and Gas Engineering.
DISQUE, ROBERT CONRAD, B. L., B. S.,	From Instructor to Assistant Professor of Electrical Engineering.
FABER, DANIEL CLEVELAND, E. E.,	From Instructor to Assistant Professor of Electrical Engineering.
FEISE, RICHARD ERNST, Ph. D.,	From Instructor to Assistant Professor of German.
FULLER, JAMES GARFIELD, B. S.,	From Assistant Professor to Associate Professor of Animal Husbandry.
HASTINGS, EDWIN GEORGE, M. S.,	From Associate Professor to Professor of Agricultural Bacteriology.
HATCH, KIRK LESTER, B. S.,	From Associate Professor to Professor of Agricultural Education.
HENMON, VIVIAN ALLEN CHARLES, Ph. D.,	From Associate Professor to Professor of Education.
HETHERINGTON, CLARK WILSON, B. A.,	From Lecturer in Physical Education to Professor of Physical Education.
JONES, EDWARD RICHARD, M. S.,	From Assistant Professor to Associate Professor of Soils.
KOMMERS, JESSE BENJAMIN, B. S.,	From Instructor to Assistant Professor of Mechanics.
KOWALKE, OTTO LOUIS, Ch. E.,	From Assistant Professor to Associate Professor of Chemical Engineering.
LUTHER, ERNEST LEONARD, B. A., B. S.,	From County Representative to State Supervisor of County Agricultural Representatives.
McCOLLUM, ELMER VERNER, Ph. D.,	From Associate Professor to Professor of Agricultural Chemistry.
McGREGOR, FORD HERBERT, B. A.,	From Instructor in Political Science to Assistant Professor in charge of Municipal Reference Bureau, Extension Division.
MARLATT, ABBY LILLIAN, M. S.,	From Professor of Home Economics to Director of the Course in Home Economics and Professor of Home Economics.
MARTIN, LAWRENCE, M. A.,	From Assistant Professor to Associate Professor of Physiography and Geography.
MEEK, WALTER JOSEPH, Ph. D.,	From Assistant Professor to Associate Professor of Physiology.

MICHELL, ROBERT BELL, Ph. D.,	From Instructor to Assistant Professor of Romance Languages.
MOORE, SAMUEL, Ph. D.,	From Instructor to Assistant Professor of English.
MORGAN, BAYARD QUINCY, Ph. D.,	From Instructor to Assistant Professor of German.
NORGORD, CHRISTIAN PERCIVAL, B. S.,	From Assistant Professor to Associate Professor of Agronomy.
PEARSE, ARTHUR SPERRY, Ph. D.,	From Assistant Professor to Associate Professor of Zoology.
ROE, FREDERICK WILLIAM, Ph. D.,	From Assistant Professor of English and Chairman of Freshmen Advisers to Assistant Professor of English and Assistant Dean, College of Letters and Science.
SCOTT, ALMERE LOUISE, B. A.,	From Instructor to Secretary, Department of Debating and Public Discussion, Extension Division.
THORKELSON, HALSTEN JOSEPH BERFORD, M. E.,	From Associate Professor of Steam Engineering to Professor of Steam and Gas Engineering.
TORMEY, JOHN LAWLESS, B. S.,	From Instructor to Assistant Professor of Animal Husbandry.
VAN VALZAH, ROBERT, B. A., M. D.,	From Assistant Professor to Associate Professor of Clinical Medicine.
WALSTER, HARLOW LESLIE, B. S.,	From Instructor to Assistant Professor of Soils.

CHANGES IN TITLE

Professors

BABCOCK, STEPHEN MOULTON, Ph. D., LL. D.,	From Assistant Director and Chief Chemist of the Agricultural Experiment Station and Professor of Agricultural Chemistry to Professor of Agricultural Chemistry, Emeritus.
DUDGEON, MATTHEW SIMPSON, M. A., LL. B.,	From Director of the Library School, Instructor in Library Administration, and instructor in Political Scinece to Director of the Library School and Instructor in Library Administration.
KELLEY, FREDERICK THOMAS, B. S., Ph. D.,	From Assistant Professor of Hebrew and Hellenistic Greek to Assistant Professor of Semitic Languages and Hellenistic Greek.
LAIRD, ARTHUR GORDON, Ph. D.,	From Associate Professor of Greek and Comparative Philology to Associate Professor of Greek.
MEAD, DANIEL WEBSTER, C. E.,	From Professor of Hydraulic and Sanitary Engineering to Professor of Hydraulic Engineering.
MEANWELL, WALTER ERNEST, M. D.,	From Assistant Professor of Physical Education to Director of Men's Gymnasium and Assistant Professor of Physical Education.
MILLAR, ADAM VAUSE, M. S.,	From Assistant Professor of Drawing to Assistant Professor of Drawing and Descriptive Geometry.

PHILLIPS, JAMES DAVID, B. S.,	From Assistant Dean of the College of Engineering and Professor of Drawing to Assistant Dean of the College of Engineering and Professor of Drawing and Descriptive Geometry.
PITMAN, ANNIE MARIE, Ph. D.,	From Assistant Professor of Latin to Assistant Professor of English, Greek, and Latin.
WATTS, OLIVER PATTERSON, Ph. D.,	From Assistant Professor of Applied Electrochemistry to Assistant Professor of Chemical Engineering.
WEISS, HAROLD FREDERICK, Ph. B.,	From Director, Forest Products Laboratory and Lecturer in Forest Products to Director, Forest Products Laboratory.
WILLIAMS, WILLIAM HOLME, B. A.,	From Professor of Hebrew and Hellenistic Greek to Professor of Semitic Languages and Hellenistic Greek.
WOLFENSON, LOUIS BERNARD, Ph. D.,	From Assistant Professor of Hebrew and Hellenistic Greek to Assistant Professor of Semitic Languages and Hellenistic Greek.

VACANCIES

Taking effect June 30, 1913, unless otherwise indicated

Professors

ALLEN, BENNETT MILLS, Ph. D.....Resigned
Assistant Professor of Zoology.

BALL, COLLIN H.....Resigned Dec. 21, 1912
Commandant. Professor of Military Science and Tactics.

BURGESS, CHARLES FREDERICK, E. E.....Resigned
Professor of Chemical Engineering.

CARPENTER, JAIRUS HARVLIN, LL. D.....Died Oct. 1, 1913
Mortimer M. Jackson Professor of Contracts, Emeritus.

CLINE, McGARVEY, M. E.....Resigned Dec. 12, 1912
Director of Forest Products Laboratory. Lecturer in Forestry.

DOOLITTLE, FREDERICK WILLIAM, M. S., C. E.....Resigned
Assistant Professor of Mechanics.

DUNLAP, FREDERICK, F. E.....Expired
Lecturer in Forestry and Forest Products.

EDWARDS, RICHARD HENRY, M. A.....Expired
Editor, Studies in Social Problems, Extension Division.

HAVARD, FRANCIS THOMPSON, E. M.....Died May 23, 1913
Associate Professor of Mining and Metallurgy.

HAWLEY, LEE FRED, Ph. D.....Expired
Lecturer in Forestry.

HOFFMAN, CONRAD, B. S.....Expired
Assistant Professor of Agricultural Bacteriology.

HUMPHREY, CLARENCE JOHN, B. A., B. S. C.....Expired
Lecturer in Plant Pathology.

JAMES, ELDON R., S. J. D.....Resigned
Professor of Law.

KUEHNEMANN, EUGEN, Ph. D., Litt. D.....Expired
Carl Schurz Memorial Professor.

LINDHOLM, SVANTE, B. L.....Expired
Lecturer in Education.

LYMAN, ROLLO LUVERNE, B. A.....Expired
Associate Professor of Rhetoric and Oratory.
McBAIN, HOWARD LEE, Ph. D.....Resigned
Associate Professor of Political Science.
MOODY, FRANK BENJAMIN, M. S. F.....Resigned
Assistant Professor of Forestry.
OCOCK, CHARLES ALBERT, B. S.....Resigned
Assistant Professor of Agricultural Engineering.
PETTIJOHN, JOHN J.....Expired
Secretary of the Department of Instruction by Lectures, Extension Division.
SHUMACKER, LEOPOLD, Ph. B., M. D.....Resigned
Assistant Professor of Clinical Medicine.
SINZHEIMER, LUDWIG, Ph. D., Dr. Pol. Econ.....Expired
Acting Professor of Political Economy.
SMITH, KENNETH GARDNER, B. A., B. S.....Resigned
Associate Professor of Mechanical Engineering. District Representative, Extension Division.
STEVENS, THOMAS WOOD.....Resigned
Lecturer in Fine Arts
THOMAS, CARL CLAPP, M. E.....Expired
Professor of Steam Engineering.
WILCE, JOHN WOODWORTH, B. A.....Expired
Assistant Professor of Physical Education.
WOLL, FRITZ WILHELM, Ph. D.....Resigned Nov. 1, 1913
Professor of Agricultural Chemistry. Chemist to Experiment Station.

VACANCIES

Taking effect June 30, 1914, unless otherwise indicated

Professors

ALVORD, KATHERINE SPRAGUE, M. A.....Resigned
Mistress of Chadbourne Hall.
BASSETT, HARRY KENDALL, M. A.....Resigned Oct. 15, 1914
Assistant Professor of English.
BETTS, HAROLD SCHOFIELD, M. E.....Expired
Lecturer in Forest Products.
CHRISTIE, ALEXANDER GRAHAM, M. E.....Resigned
Associate Professor of Steam and Gas Engineering.
COOK, ARTHUR MAYHEW, B. A., M. F.....Resigned Aug. 1, 1914
Associate Professor of Forestry. Assistant State Forester.
FABER, DANIEL CLEVELAND, E. E.....Resigned Sept. 1, 1914
Assistant Professor of Electrical Engineering.
FULLER, CALEB ALLEN, Ph. D.....Expired
Assistant Professor of Bacteriology.
HAMILTON, FRED RUTHERFORD, Ph. B.....Resigned Aug. 1, 1914
District Representative, Extension Division.
HOWARD, ROBERT FRANCIS, M. A.....Resigned Nov. 1, 1914
Assistant Professor of Horticulture.
HUTCHINS, FRANK AVERY.....Died Jan. 25, 1914
Secretary of the Department of Debating and Public Discussion, Extension Division.
KLEIN, DAVID, Ph. D.....Resigned Jan. 21, 1914
Assistant Professor of Chemistry.
LEWIS, IVEY FOREMAN, Ph. D.....Resigned
Assistant Professor of Botany.
LOCKE, ARTHUR WARE, B. A.....Resigned
Assistant Professor of Music.
LORENZEN, ERNST GUSTAV, Ph. B., LL. B., J. U. D.....Resigned Aug. 27, 1914
Professor of Law.

McKERROW, GEORGE ..... Resigned May 31, 1914
Superintendent of Farmers' Institutes.
MOORE, BLAINE FREE, Ph. D. ..... Expired
Lecturer in Political Science.
MOORE, WILLIAM UNDERHILL, M. A., LL. B. ..... Resigned
Professor of Law.
NEYSTROM, PAUL HENRY, Ph. M. ..... Resigned
Assistant Professor of Political Economy.
PROKOSCH, EDUARD, Ph. D. ..... Expired
Assistant Professor of German.
RAVENEL, MAZYCK PORCHER, M. D. ..... Resigned
Director of the State Laboratory of Hygiene. Professor of Bacteriology.
REINHARD, EUGENE, Ph. D., LL. D. ..... Died Jan. 8, 1914
Assistant Professor of German.
THWAITES, REUBEN GOLD, LL. D. ..... Died Oct. 22, 1913
Lecturer in History.
TRESSLER, ALBERT WILLIS, B. A. ..... Resigned Sept. 1, 1914
Inspector of Schools.
VANDERVORT, LYNETTE McNIEL ..... Resigned
Mistress of Barnard Hall.
WOODBERRY, GEORGE EDWARD, L. H. D., LL. D. ..... Expired
Lecturer in English Literature.

FINANCIAL STATEMENTS

RECEIPTS AND EXPENDITURES

FOR DETAILS OF RECEIPTS AND EXPENDITURES SEE UNIVERSITY BULLETIN NO. 705.

SUMMARY OF RECEIPTS

Fiscal Year, 1912-13

Accumulated surplus, June 30, 1913:				
Transferred				($19,172.52)
Untransferred				(255,611.00)
				($274,783.52)
Receipts from Students:				
Tuition fees	Sched'le	B-2	$79,037.50	
Incidental fees	"	B-3	170,427.24	
Special fees for gymnasium, etc	"	B-4	5,497.60	
Special fees for laboratories	"	B-5	45,809.75	
Gross receipts from dormitories	"	B-6	12,502.40	
Gross receipts from dining halls	"	B-7	67,037.36	
				$380,711.85
Receipts from Investments:				
Interest on "University Fund"	"	P-1	$11,790.85	
Interest on Current Balances	"	P-2	7,304.51	
Interest on "Agricultural College Fund"	"	Q-1	12,779.18	
Interest on University Trust Funds	"	Q-2	(7,317.18)	
				$31,574.54
Receipts from Grants:				
Federal Government	"	T-1	$80,000.00	
				$80,000.00
State of Wisconsin:				
I (From tax levy ⅛ mill, gen'l purposes (Amount actually transferred.)	"	T-2	$810,090.00	
I (Appropriation, general purposes	"	T-3		
II Appropriation, designated purposes	"	T-4	289,666.99	
III Appropriation, new construction	"	T-5	379,801.57	
				$1,479,468.56
Receipts from Gifts:				
General purposes	"	V-1		
Designated purposes	"	V-2	$10,745.17	
				$10,745.17
Receipts from Various Sources:				
Sales	"	W-1	$131,153.57	
Technical inspections	"	W-2	26,225.50	
Unclaimed checks	"	W-3	792.45	
Insurance recovered	"	W-4	22.40	
Refunds from advances	"	W-5	3,634.15	
Library fines	"	W-6	195.10	
Lectures, concerts and conventions	"	W-7	1,529.30	
Athletic council	"	W-8		
Unclassified	"	W-9	2,123.80	
Total Receipts Exclusive of Trust Funds, Deposited and Temporary Loans				$2,148,476.39

SUMMARY OF RECEIPTS
Fiscal Year, 1913-14

Accumulated Surplus, June 30, 1914				(307,220.91)
Receipts from Students:				
Tuition fees	Sched'le	B-2	$91,217.50	
Incidental fees	"	B-3	186,99).07	
Special fees for gymnasium, etc	"	B-4	6,238.05	
Special fees for laboratories	"	B-5	122,069.33	
Gross receipts from dormitory	"	B-6	28,347.44	
Gross receipts from dining halls	"	B-7	103,550.05	
				$538,412.44
Receipts from Investments:				
Interest on "University Fund"	"	P-1	$11,963.62	
Interest on Current Balances	"	P-2	3,771.93	
Interest on "Agricultural College Fund"	"	Q-1	12,728.14	
Interest on University Trust Funds	"	Q-2	(8,118.23)	
				$28,463.69
Receipts from Grants:				
Federal Government	"	T-1	$80,000.00	
				$80,000.00
State of Wisconsin:				
I Tax levy ⅛ mill, general purposes	"	T-2	($1,124,320.00)	
I Appropriation general purposes	"	T-3	1,379,938.40	
I (Amount actually tarnsferred)				
II Appr., designated purposes	"	T-4	420,367.33	
III Appropriation new construction	"	T-5	343,550.73	
				$2,153,856.46
Receipts from Gifts:				
General purposes	"	V-1		
Designated purposes	"	V-2	$12,721.14	
				$12,721.14
Receipts from Various Sources:				
Sales	"	W-1	$156,124.75	
Technical inspections	"	W-2	34,896.95	
Unclaimed checks	"	W-3	2,035.83	
Insurance recovered	"	W-4	155.25	
Refunds from advances	"	W-5	4,166.55	
Library fines	"	W-6	86.08	
Lectures, concerts and conventions	"	W-7	34,654.78	
Athletic Council	"	W-8	45,169.97	
Unclassified	"	W-9	2,510.65	
				$279,800.81
Total Receipts Exclusive of Trust Funds, Deposits, and Temporary Loans				$3,093,254.54

LETTER OF STATE TREASURER

October 12, 1912.

PRESIDENT OF THE REGENTS OF THE UNIVERSITY OF WISCONSIN.

Dear Sir:—I have the honor to submit my report as treasurer of the Board of Regents of The University of Wisconsin for the fiscal years ending June 30th, 1913 and June 30th, 1914.

HENRY JOHNSON,
State Treasurer.

UNIVERSITY FUND INCOME

Statement of Receipts and Disbursements from July 1, 1912 to June 30, 1913

RECEIPTS		
July 1, 1912—Balance on hand	$249,559.82	
Interest on land contracts	49.46	
Interest on loans	3,421.39	
Interest on bonds	550.00	
Interest on State Deposits	5,659.10	
Interest on Certificates of Indebtedness	7,770.00	
United States Government	80,000.00	
Loan from General Fund	150,000.06	
Building Appropriation	287,034.50	
Woman's Dormitory	92,767.07	
Books and Apparatus	50,000.00	
University Extension	125,000.00	
University Bursar	558,744.34	
Insurance recovered	22.40	
Traveling School of Agriculture	40,000.00	
Agricultural Institutes	20,000 00	
State Tax	810,000.00	
Land Purchases	48,166.99	
Agricultural Experiment Station	2,000.00	
Agricultural Demonstration Station	1,080.00	
Agricultural College Income	12,779.18	
Douglas County Experiment Station	500.00	
Washburn Observatory	3,000.00	
Cancelled Drafts	11.96	
DISBURSEMENTS		
Warrants paid, 1912-13		$2,378,863.69
General Fund loan repaid		150,000.00
Balance June 30, 1913		19,172.52
	$2,548,036.21	$2,548,036.21

UNIVERSITY FUND INCOME

Statement of Receipts and Disbursements, July 1, 1913, to June 30, 1914

RECEIPTS			
July 1, 1913. Balance on hand		19,172.52	
Interest on Land Contracts		49.46	
Interest on Loans		3,724.16	
Interest on Bonds		420.00	
Interest on State Deposits		3,184.77	
Interest on Certificates of Indebtedness		7,770.00	
United States Government		80,000.00	
Tax Remission		255,611.00	
Taxes		1,124,327.40	
University Bursar		831,299.30	
Insurance—Fire Losses		147.25	
Loan, First National Bank, Milwaukee		300,000.00	
Refund—Jessie Wilcox		75.00	
Ag. College Income Transfer		12,728.14	
GENERAL FUND APPROPRIATIONS			
Buildings	$252,317.14		
Books and apparatus	40,643.44		
Woman's Building	43,880.55		
Sub-Section 1	163,016.14		
3	40,000.00		
7	1,319.00		
8	7,620.00		
9	66,898.30		
10	48,325.00		
Sec. 7, Chap. 631, Laws 1911	47,000.00		
Sub-Section 11	48.48		
14	47,304.56		
16	2,882.79		
20	2,500.00		
21	2,500.00		
22	3,283.20		
Contagious Abortion	2,177.85		
Sub-Section 25	1,201.61		
30	1,000.00	773,918.06	
Total		$3,412,427.06	
DISBURSEMENTS			
University warrants			$2,805,206.15
Loan, First National Bank, Milwaukee			300,000.00
Balance, June 30, 1914			307,220.91
			$3,412,427.06
RECAPITULATION			
Balance on hand July 1, 1912		$249,559.82	
Receipts for two years		5,691,730.93	
Disbursements for two years			$5,634,069.84
Balance June 30, 1914			307,220.91
		$5,941,290.75	$5,941,290.75

SUMMARY OF EXPENDITURES, FISCAL YEAR 1912-1913

	University Divisions	A Expenditures for Instructional and Administrative Services	B Expenditures for Wages	C Expenditures for Maintaining Offices	D Expenditures for Consumable Material and Supplies	E Expenditures for Maintaining Buildings and Grounds	F Expenditures for Permanent Improvements	Total Expenditures by Divisions
1	Administration	$54,449.15	$896.74	$26,265.32	$467.01	$4,298.59	$1,993.06	$88,299.87
2	General Library	17,747.43		565.88	.58	9,452.46	25,678.98	53,445.33
3	Physical Education	30,599.64	7,069.25	836.96	2,945.61	12,959.90	3,768.49	58,179.85
4	Military Science	1,835.13	25.00	148.74	127.63	1,324.52	750.17	4,211.19
5	*College of Letters and Science	449,132.12	12,971.63	4,829.18	32,370.78	42,467.02	27,692.19	569,462.92
6	College of Agriculture	184,318.68	70,673.90	19,330.40	114,730.70	28,972.93	38,477.95	456,504.56
7	College of Engineering	116,488.14	7,662.41	2,220.44	6,682.68	21,500.24	11,095.07	165,648.98
8	Law School	26,694.38	723.67	272.78	10.48	2,729.09	2,566.79	32,997.19
9	**Medical School	39,209.80	3,815.35	627.31	5,141.15	2,947.29	6,421.05	58,161.95
10	School of Music	19,286.24	679.00	220.16	83.43	1,717.34	1,885.89	23,872.06
11	Training of Teachers	22,404.80	339.98	596.90	111.47	1,306.84	642.51	25,402.50
12	Graduate School	840.00		67.34				907.34
13	Summer Session	29,183.64	110.37	1,465.23	16.79	2,673.45	90.20	33,539.68
14	University Extension	119,359.41	784.16	23,327.52	1,614.16	2,905.98	5,205.90	153,197.13
15	Agricultural Institutes	8,797.50	72.50	11,586.02	5.54	7.50	48.33	20,517.39
16	Hygienic Laboratory	6,542.01	660.00	503.70	909.75	380.65	1,327.97	10,324.08
17	High School Inspection	4,247.30		2,533.51	97.25		8.40	6,886.46
18	Washburn Observatory	5,680.00	720.00	55.24	6.39	1,563.26	671.04	8,695.93
19	Forest Products Laboratory			131.03		6,032.19		6,163.22
20	Physical Plant	4,041.27	28,302.60	3,259.10	52,244.77	38,520.10	455,014.28	581,382.12
21	Store	4,045.89			8,148.54			12,194.43
		$1,144,902.53	$135,506.56	$98,842.76	$225,714.71	$181,689.35	$583,338.27	$2,369,994.18
	Fees Refunded							8,869.51
	Total Expenditures							$2,378,863.69

* Library School included in Letters and Science.
**Student Health included in Medical School.

SUMMARY OF EXPENDITURES FISCAL YEAR 1913-1914

University Divisions	A Expenditures for Instructional and Administrative Services	B Expenditures for Wages	C Expenditures for Maintaining Offices	D Expenditures for Consumable Material and Supplies	E Expenditures for Maintaining Buildings and Grounds	F Expenditures for Permanent Improvements	Total Expenditures by Divisions
1 Administration	$60,714.54	$2,590.55	$17,001.57	$445.79	$8,448.60	$1,729.17	$90,930.22
2 General Library	16,936.89	1,563.17	534.74		9,772.73	25,300.80	54,108.33
3 Physical Education	56,814.16	7,109.64	12,197.07	8,411.79	19,811.22	9,590.88	113,934.76
4 Military Science	1,677.90	159.60	205.66	166.18	1,667.83	892.53	4,769.70
5 College of Letters and Science	486,729.60	13,844.85	7,460.75	39,922.04	40,261.37	16,108.95	604,327.56
6 College of Agriculture	222,063.81	70,955.67	33,318.35	168,306.53	36,001.78	32,470.15	563,116.29
7 College of Engineering	117,737.76	7,340.86	3,845.45	8,608.89	20,630.95	12,717.12	170,881.03
8 Law School	27,380.00	995.07	475.91	11.73	2,596.02	5,386.35	36,845.08
9 Medical School	48,064.11	3,733.78	1,229.04	6,363.05	3,599.41	5,657.83	68,447.22
10 School of Music	23,167.29	867.49	391.42	56.80	1,988.50	3,050.22	29,521.72
11 Training of Teachers	27,223.52	365.10	753.15	178.02	2,449.12	890.27	31,859.18
12 Graduate School	895.00		275.78			3.75	1,174.53
13 Summer Session	33,734.16	22.90	1,570.91	2.50	3,066.81	178.07	38,575.35
14 University Extension	160,320.70	2,724.79	34,242.52	1,490.17	6,652.83	9,094.71	214,525.72
15 Agricultural Institutes	8,333.33	40.00	12,543.74	7.82	9.00		20,933.89
16 Hygienic Laboratory	7,343.02	952.44	503.71	993.68	378.40	622.31	10,793.56
17 High School Inspection	5,325.20	7.40	2,627.17	17.25	2.25	137.12	8,116.39
18 Washburn Observatory	5,790.00	891.29	72.55	16.63	1,589.98	97.75	8,458.20
19 Forest Products Laboratory			187.98		5,744.35		5,932.33
20 Physical Plant	5,553.16	43,440.93	747.82	84,000.80	62,176.04	512,959.25	708,878.00
21 Stores	5,257.96			3,341.22			8,599.18
	$1,321,062.11	$157,605.53	$130,185.29	$322,340.89	$226,647.19	$636,887.23	$2,794,728.24
Fees Refunded							$10,477.91
Total Expenditures							$2,805,206.15

BIENNIAL REPORT

OF

THE ADJUTANT GENERAL

OF THE

STATE OF WISCONSIN

For the Two Fiscal Years Ending June 30, 1914

MADISON, WISCONSIN
DEMOCRAT PRINTING COMPANY, STATE PRINTER
1914

STATE OF WISCONSIN

THE ADJUTANT GENERAL'S OFFICE

Madison, July 1, 1914.

From: THE ADJUTANT GENERAL.

To: THE HONORABLE FRANCIS E. McGOVERN, *Governor.*

Subject: BIENNIAL REPORT.

1. Pursuant to law, I herewith submit biennial report to July 1st, 1914, which covers also the period July 1st, 1912, to October 1st, 1913 of the incumbency of my predecessor in office, Brigadier General Charles R. Boardman.

2. ORGANIZATION AND STRENGTH, W. N. G.

During this term, the Hospital Corps of the state has been made more complete and efficient by the organization and muster in of the First Field Hospital, Wisconsin, permanent station Milwaukee. There has been no other change in organization.

The strength of the Wisconsin National Guard, July 1, 1914, was 201 commissioned officers and 2990 enlisted men, a decrease in two years of 6 officers and an increase during the same period of 198 enlisted men.

The strength of the Naval Militia of the state remains practically as at the date of the last biennial report from this office and consisted July 1, 1914, of 12 commissioned officers and 114 enlisted men.

3. LEGISLATION.

The appropriation clauses of certain special laws were repealed (Laws of Wis. 1913) as also the special appropriation for the Naval Militia, and the sum of $158,000.00 appropriated annually, beginning July 1, 1913, to carry into effect the powers, duties and functions provided by law for Wisconsin National Guard including the State Naval Militia. This reduced by the sum of $7,500.00 the amount heretofore available by general and various special acts for State military and naval purposes.

4. EQUIPMENT.

All organizations of the State guard are fully armed, clothed and equipped. The full quota of field wagons and ambulances, and complement of harness required by present Field Service Regulations, U. S. A., are stored at the State Military Reservation.

There is also being gradually accumulated in the storehouses at this point, a reserve stock of clothing, blankets, shoes, and all other necessary articles of personal equipment of the soldier in readiness for issue on possible sudden emergency. This very gratifying state of affairs is due primarily and in greatest measure to the wise and economical use of the United States funds applicable to the purpose under the supervision and management of Major Charles R. Williams, Chief Quartermaster.

5. INSTRUCTION.

This work, both theoretical and practical has been advanced along the lines and by methods outlined by Colonel John F. Morrison and Captain Edgar T. Collins, U. S. A.

The State was deprived of the very valuable services of the latter officer early in the year 1913 on account of his recall for service with regular troops. His position as instructor was and is ably and acceptably filled by Captain R. H. Wescott, U. S. A. Under the direction of this officer the usual schools have been continued with such changes of textbook and subject as seemed likely to impart most practical military information to officers and men of the Guard.

6. CONDITION.

The present state of instruction and efficiency in the Guard may best be reported by incorporating herein extract from Circular No. 4, War Department, Division of Militia Affairs, Washington, March 13, 1914, viz:

I. Table XXV, page 246, Report of the Chief, Division of Militia Affairs for the year 1913, giving the statement showing the results of rifle practice for the year 1912 is in error in the case of the State of Wisconsin.

The table shows:	
Total firing rifle	467
Percentage of total strength armed with the rifle, firing the rifle	16.53
These figures should be:	
Total firing rifle	2,651
Percentage of total strength armed with rifle, firing the rifle	93.81

"This error is especially regretted in view of the fact that the Organized Militia of Wisconsin may be taken as a model in the matter of training, equipment and business administration."

No report of progress of the State Guard in drill and discipline is complete without an acknowledgment of the valuable services constantly being rendered by Brigadier General Charles King, (Captain U. S. A. Retired).

7. ENCAMPMENTS.

In the year 1912, the Second and Third Infantry, Battery A, 1st Field Artillery, and Detachment of Troop A, 1st Cavalry, together with a regiment of Illinois Infantry and a Squadron of Regular Cavalry organized as a Provisional Brigade under command of the Colonel, 3rd Infantry, Wisconsin National Guard, participated in a joint maneuver campaign from the State Military Reservation to Sparta, Wisconsin, operating against the Provisional Regiment, a Battery and six troops of Cavalry, U. S. Army. The conduct of the campaign and of Wisconsin troops participating therein was such as to win the approval and warm commendation of the Regular Army officers detailed as umpires and observers.

The First Regiment and 10th Separate Battalion Infantry held a joint camp at the military reservation. The Cavalry troop served a full tour of seven days field duty.

The encampments of infantry organizations in the year 1913 were held by provisional brigades, the camp of the 1st and 2nd Infantry being followed by that of the 3rd Infantry and 10th Separate Battalion Infantry. The mounted organizations performed field service for the ordered period of seven days in localities and under circumstances better adapted for their peculiar training.

The attendance at all of these encampments has been most commendable, in organizations seldom less than ninety per cent of total strength, often reaching one hundred per cent and in the whole totaling over ninety-five per cent annually of the then strength of the entire force.

Disciplinary rules have been more strictly enforced each ensuing year and the amount of practical field work increased and amplified with no apparent lessening of the zeal and earnestness with which officers and men strive to gain efficiency.

8. SMALL ARMS FIRING.

Interest and participation in target practice with both rifle and pistol have been thoroughly maintained under the very efficient direction and supervision of Major R. B. McCoy, Inspector of Small Arms Practice, and the several regimental inspectors. As disclosed by War Department reports the standard of marksmanship among Wisconsin troops compares very favorably with that attained in like organizations in other states. To better stimulate and direct increased practice and promote better average marksmanship, more freedom of application of the funds available for this practice has been allowed to organization commanders,—gallery practice stimulated by prizes to be awarded and by inter-company competitions and inspectors of small arms practice authorized and directed to periodically visit the several organizations for purposes of instruction and inspection.

A State team selected from the Guard in competition participated in the National Team Match at Camp Perry, Ohio, in August, 1913—viz:

Alexander E. Shiells, 2nd Lieutenant, 1st Infantry.

William J. Shiells, Sergeant, Co. E, 1st Infantry.

Gustave C. Schwandt, 2nd Lieut. 2nd Infantry.
Erwin F. Grundeman, Sergeant, Co. G, 2nd Infantry.
John F. Klinge, Sergeant Major, 3rd Infantry.
John B. Gay, Musician, Co. F, 3rd Infantry.
Leonard L. Bailey, Q. M. Sergeant, Co. C, 3rd Infantry.
Anthony Lund, Q. M. Sergeant, Co. I, 3rd Infantry.
John H. Russell, Sergeant, Co. L, 2nd Infantry.
Walter Mueller, Q. M. Sergeant, Co. A, 2nd Infantry.
Bert J. Funk, Color Sergeant, 2nd Infantry.
Leo. J. Longdin, Corporal, Co. E, 2nd Infantry.
Alfred E. Gaartz, 1st Lieut. 1st Infantry.
Harry E. Hoey, Sergeant, Co. F, 1st Infantry.
Allen B. Ellis, Sergeant, Co. G, 2nd Infantry.

In all stages of this match the Wisconsin team held its own with the best but in the final skirmish run unfavorable conditions which equally reduced the score of the Regular Infantry team competing on the same order, resulted in a total score of 2550, 125 points less than the winning Regular Cavalry team. In consequence Wisconsin stood twelfth among forty-five competitors and remains a first division team.

9. WISCONSIN NAVAL MILITIA.

I regret to be obliged to report that to this date no gunboat has been assigned by the Navy department for the use of the Naval Militia of this state although promised in the near future two years since. This seriously militates against interest in the work and greatly lessens opportunity for proper instruction.

Notwithstanding this handicap official returns and inspection reports of Major Jno. G. Salsman, Adjutant General, under whose direct charge the affairs of the Naval Militia have been administered, show a strength not greatly reduced and under the circumstances good attention to and proficiency in necessary drills and training.

By arrangement with the State of Michigan, six officers and forty-eight petty officers and seamen, Wisconsin Naval Militia were assigned as part of the crew of the U. S. S. Yantic and served as such during a cruise of fourteen days beginning August 9th, 1914.

Considering all circumstances and especially the improbability of obtaining a fit training ship, I respectfully recommend the

muster out of the Wisconsin Naval Militia and the incorporation of its members so far as is possible in the increased or new organizations of land militia necessary to be had in Wisconsin to conform with the Divisional organization O. M. recommended by the War Department.

10. MEDICAL DEPARTMENT.

During the period covered by this report, the office of Surgeon General has been held by Colonel John B. Edwards, retired for age February 5, 1913; Colonel Edward N. Grannis, resigned October 1st, 1913; and by the present incumbent Colonel Gilbert E. Seaman, appointed by Executive Order dated October 1st, 1913.

In order to fully comply with the Regulations governing the Organized Militia as defined in Circular No. 8, D. M. A. dated August 1st, 1913, Colonel Seaman was retired as Colonel and immediately reappointed with the grade of Major and the designation of his office changed from Surgeon General to The Chief Surgeon, W. N. G.

Upon his recommendation the maximum number of enlisted men in each of the regimental sanitary detachments has been increased from twelve to twenty-four, with corresponding increase in number of hospital corps men attached to lesser independent units.

For better instruction, wherever possible, two medical officers have been or will be recommended for commission at each of the three stations of sanitary detachments.

Also upon the recommendation of the Chief Surgeon the Hospital Corps of the State has been made more efficient for service in case of public disaster within the State or possible war without, by the organization of a fully equipped Field Hospital.

In addition to routine duties performed during encampments, officers of the Medical Corps, under direction of the Chief Surgeon, have been instrumental in vaccinating against typhoid nearly all the present active strength of the Guard.

11. QUARTERMASTER CORPS AND ORDNANCE DEPARTMENTS.

Under authority conferred by Wisconsin Statutes and in order to conform to the organization prescribed for the United States Army, the Quartermaster's, Subsistence and Pay De-

partments were by General Orders No. 17, Series of 1912, consolidated into a single bureau to be known as the Quartermaster Corps and the designation Quartermaster General was discontinued.

By amendment of the State Laws (1913), the duties of the Quartermaster General were devolved upon the Adjutant General, but the affairs both of the Quartermaster Corps and Ordnance Department have continued under the direct charge and supervision of Major Charles R. Williams, Chief Quartermaster, whose excellent service has alrealy been mentioned.

During the period reported upon, by judicious use of funds allotted by Congress to the State for the purpose, all Wisconsin troops have been as completely equipped as is possible in view of the continual minor changes in uniform and equipment, which are being made in the Army and to which the organized militia is required to conform.

Instruction and supervision given by the Chief Quartermaster to Quartermaster Sergeants of organizations who have been made caretakers of issued property, and more frequent and rigid inspections of such property by officers acting under his instructions have minimized avoidable loss and deterioration. Facilities have been provided at the Military Reservation for the repair of many articles of issue and none such capable of being put in serviceable condition are destroyed.

When rifle barrels become unserviceable from use or other cause, these and worn spare parts are replaced, mounted, fitted and reblued at the State Ordnance Depot effecting a very large saving over the price of a new rifle and returning a piece in every way as good. By these and other like saving methods, the cost of maintenance of arms and equipment of the Wisconsin National Guard is kept at the minimum and is lower pro rata than that of any similar organization.

12. WISCONSIN MILITARY RESERVATION.

Pursuing here as far as possible the plan of conserving the old frame buildings, the range house (log) has been re-roofed with a durable fireproof roofing; the foundation logs which were fast decaying have been imbedded in concrete which was extended on three sides of the building to form a platform upon which also rests the wooden porch columns.

The commissary building and old guard house now used both as storehouses and repair shops, have been moved to more convenient locations and placed on concrete foundations. This improvement adds not only to their safety as warehouses, but greatly to their comfort and convenience as workshops and assures their permanence for a period of years. All of these buildings are absolutely required and are in fact inadequate for the storage of the large amount of valuable military property in the custody of the Chief Quartermaster.

The decayed and dangerous wood shingle roof of the brick Ordnance depot has been relaid with fireproof asbestos shingles.

During the year, 80 acres of land adjacent to and in rear of the artillery and rifle butts was purchased for the consideration of $7.50 per acre.

Only the last two items of expense have been drawn from and charged to the funds available under the provisions of Section 172—3. 3. Revised Statutes.

13. MOBILIZATION.

During the Spring months of the present year, the mobilization of the Organized Militia seemed a very probable contingency and circulars and letters from the War Department strongly urged that all possible preparation for such mobilization and camps be made in advance. The Reservation having been previously designated as the mobilization point for Wisconsin troops, the necessary additional camp sites were selected and arrangements fully perfected at the minimum of cost to care for the full strength of the Guard on the basis of war strength organizations.

This involved considerable extraordinary expense, including the cost of extending telephone lines, enlargement of exchange, thorough repair of the entire telephone system and the building of permanent latrines in number to accommodate all organizations of the Guard assembled in one camp, but all was accomplished within the limit of the usual annual appropriation for military purposes.

The Chief Quartermaster also prepared a schedule of train service for mobilization at Camp Douglas, which was approved without correction by the operating Departments of the railways affected. This schedule is complete in detail, has been highly

commended by Department officials and now remains a standing order whereby on twenty-hour hours notice to the proper railway officials all Wisconsin troops can be mobilized.

14. AWARD OF SERVICE MEDALS.

The medal for fifteen years service provided for by Section 649—312 of the Statutes, has during the biennial period since July 1, 1912, been awarded to fifty-nine officers and enlisted men, whose names, grades and organizations have been announced in Special Orders heretofore published.

15. BREVET SECOND LIEUTENANTS.

The proper authorities of the University of Wisconsin having reported them as entitled to the honor, brevet second lieutenant commissions in the Wisconsin National Guard, as provided by law, have been issued to the following:

In 1913.

EUGENE C. NOYES,
ARCHIBALD R. TAYLOR,
EDWARD J. WALKER,
CONVERSE WURDEMAN,
ERHARD G. TESCHAN.

In 1914.

MYRON T. RAY,
HARRY A. COBAUGH,
CHARLES A. NOREM,
CHARLES A. CIBELIUS,
WINFRED C. DITTMAR.

16. PENSION DIVISION.

This division in this office is ably cared for by M. J. Rawson, a veteran of the 21st Regiment, Wisconsin Infantry Volunteers, Civil War.

At the date of last report, June 30th, 1912, the number of claims filed through this office pending before the Commissioner of Pensions was.....	1,348	
During this biennial period July 1, 1912 to June 30, 1914, there were filed with the Commissioner of Pensions claims to the number of.....	2,480	
		3,828
Of this number there were allowed by the Pension Commissioner	3,409	
There were rejected	93	
Claims filed without title	20	
Claimants died before adjudication of claim...	32	
Claims abandoned by declarants.....	48	
		3,602
Leaving number of claims now pending before the Commissioner of Pensions.....		226

The record shows that business relative to pension matters is kept as current as is possible. During the period about 4000 letters were sent relative to pension matters, and a large number of affidavits were prepared for claimants personally present.

17. VOLUNTEER SERVICE DIVISION.

The work of this Division has been in amount much the same as during the periods previously reported. The call for certificates continues for use by the Wisconsin veterans living out of the State to substantiate claims for pensions; to establish title in homestead claims, and especially for certificates by descendants who wish to establish right of entry to patriotic and military societies. The number of certificates issued and letters written number approximately 2500, varying from full certificates under seal of the office to statements of service in letter form, besides the usual correspondence.

18. GETTYSBURG CELEBRATION.

As directed by Chapter 125, Laws of Wisconsin, 1913, enrollment was made in the office of The Adjutant General, of the veteran soldiers entitled under the provisions of the Act to attend

the Celebration of the Fiftieth Anniversary of the Battle of Gettysburg. The total number so enrolled was 336, of whom 310 attended the celebration at Gettysburg, Pa., July 1st, 2nd and 3rd, 1913. Transportation arrangements were made by Major John G. Salsman, Adjutant General, to whose efficient charge was also committed the care of the party en route. A Statement of the authorized necessary disbursements is appended to this report.

19. PERRY'S VICTORY CELEBRATION.

Chapter 675, Laws of Wisconsin, 1913, appropriated the sum of eight thousand dollars to enable participation by the Wisconsin National Guard and Naval Militia in the Centennial Celebration of Perry's Victory on Lake Erie. The appropriation being so limited as to preclude payment of troops participating, the service was made voluntary. Notwithstanding, a large portion of the Guard participated in the parades and exercises. Two provisional regiments of infantry of nine companies each, the Troop, Battery and Sanitary Detachment, under command of Brigadier General Charles King, at Milwaukee on August 6th, 1913, and an Infantry regiment, twelve companies, Band and Hospital Corps under command of Colonel F. W. Gruetzmacher at Green Bay August 13th. The troops presented an excellent appearance in ranks and gained credit for the Guard by their orderly conduct at all times. A summary of the necessary expenses is appended to this report.

20. DIVISIONAL ORGANIZATION, ORGANIZED MILITIA.

As a primary step toward making the organized militia an effective force for national defense, Divisional Districts, equitably apportioned among all the States have been outlined by Federal authority.

The Wisconsin troops together with those of Iowa, Minnesota, North and South Dakota are assigned as the Thirteenth Division Organized Militia.

In order to coöperate with this very important action of the War Department, State legislation should be enacted enabling the State troops, by transfer or otherwise, to be conformed to the divisional requirement apportioned to the State both in number and in kind of military organizations.

In conclusion I wish to express in behalf of the whole Guard their appreciation of your constant consideration and wise forethought in all matters affecting their welfare.

O. HOLWAY,
The Adjutant General.

FINANCIAL STATEMENT.

Disbursements.

	July 1, 1912, to June 30, 1913.	July 1, 1913, to June 30, 1914.
Rent of armories	$23,400 00	$23,625 00
Allowances to Company Commanders	2,100 00	2,100 00
Allowances to Battalion Commanders	500 00	500 00
Allowances to Regimental Adjutants	150 00	150 00
Allowances to Regimental Headquarters	350 00	300 00
Allowances to Hospital Corps	570 00	920 00
Clothing allowances	13,775 00	13,215 00
Extra horse hire Troop and Battery	3,000 00	3,000 00
C. R. Boardman, The Adjutant General, salary	2,000 00	333 32
C. R. Boardman, expense	28 30	17 75
O. Holway, The Adjutant General, salary	.....	1,500 00
O. Holway, expense	.....	199 23
J. G. Salsman, Adjutant General, salary	1,800 00	2,499 97
J. G. Salsman, expense	199 08	169 60
Salaries, National Guard Department	3,400 00	3,700 00
Salaries, Pension Department	1,380 00	1,380 00
Pay of troops in camp	47,224 07	49,475 95
Troop A, 1st Cavalry, care and feed of horses	6,000 00	6,000 00
Battery A, 1st F. A., care and feed of horses	3,500 00	3,500 00
Quartermaster General Department	22,414 42	22,214 17
Medical Department	955 65	749 83
Telegraph, telephone, express and freight	82 08	269 76
Printing	862 92	1,057 04
Postage	601 00	798 00
Light Horse Squadron Armory Association	2,000 00	2,000 00
Naval Militia	3,944 66	3,350 00
Dues National Guard Association U. S.	30 00	30 00
Report National Guard Association U. S.	8 00	.....
Pay of Company Armorers	12,781 93	13,260 00
Expense Officers and N. C. O. U. S. A.	746 59	867 91
Army & Navy Journal	6 00	6 00
Tapping & Reideburg, bonding officers	188 75	.....
Major C. R. Williams, expense Q. M. Black River Falls	295 85	.....
C. F. Lamb, Q. M. bond	25 00	10 00
Major M. C. Bergh, Paymaster, expense	25 62	.....
Books, C. H. Kirkland, Toledo	6 00	.....
Pay of officers at inspections	523 05	272 12
Books, S. C. Williams, Ft. Leavenworth	30 00	.....
Pay, Capt. J. W. Frew, M. C. School at Ft. Leavenworth	366 67	.....
H. W. L. Neimeyer, officers' bond	230 00	230 00
Maps, Donald W. Strong, Ft. Leavenworth	4 15	.....
Bond, Paymaster, Bonham & Heath	112 50	.....
Louis Esser Co., medals	284 00	106 00
Major J. W. Frew, maps	.....	3 00
Geo. F. Cram, maps	.....	7 50
	$155,901 29	$157,817 38

EXPENDED UNDER AUTHORITY OF SECTION 172—3.3. STATUTES 1913.

June 16th.	C. J. Phelps and J. L. Byer, for land	$600.00
June 25th.	Johns Manville Company, improvement to buildings Wisconsin Military Reservation	981.95
		$1,581.95

DISBURSEMENTS, GETTYSBURG CELEBRATION.

Schwaab Stamp & Seal Co.	$90.00
John C. Prien, sleeper tickets	49.95
Frank S. Rawch, Agt. W. M. Ry., sleeper tickets	510.30
J. Lewis Good & Co., preparing body	75.00
Mrs. Edgar Bigsby, return corpse	42.66
John G. Salsman, expense	15.00
Green Bay & Western Ry.	217.13
Green Bay & Western Ry.	42.91
Chicago, St. Paul, Minneapolis & Omaha Ry.	1,015.03
Lake Shore & Michigan Southern Ry., O. W. Crapser Agt. Pullman Co.	745.65
F. C. Winkler, expense	113.00
Chicago, Burlington & Quincy Ry.	79.68
Chicago & Northwestern Ry.	2,234.77
Chicago, Milwaukee & St. Paul Ry.	3.34
Chicago, Milwaukee & St. Paul Ry.	5,575.45
Minneapolis, St. Paul & Sault Ste Marie Ry.	1,259.36
Chicago & Northwestern Ry.	158.00
Cleveland, Cincinnati, Chicago & St. Louis Ry. Dining service	1,098.50
Chicago, Milwaukee & St. Paul Ry.	206.00
Chicago, Milwaukee & St. Paul Ry.	69.44
Total	$13,592.17

DISBURSEMENTS—PERRY'S VICTORY CELEBRATION.

Republican Hotel	$19.80
Major J. B. Schneller	3.00
Captain W. F. Mehl	14.10
Adolph Haisch (meals)	820.00
Milwaukee Electric Ry. & Lt. Co.	16.00
Captain E. A. Hickey, transportation	83.50
Captain M. D. Imhoff, (exp)	2.10
Captain M. D. Imhoff, (car fare, companies)	13.00
Carnival Costume Co.	1.00
Captain T. B. Beveridge (exp)	4.96
Fred C. E. Ringe, (labor)	7.50
Arthur Manger, (horses)	269.00
Wm. Johnson (cook)	5.00
Danes Express Line	34.75
C. P. Langewohl (Batt. supper)	29.22
Robert Larson (horses Batt.)	30.00
Fred W. Dickens, Sect. (powder)	125.00
Captain J. F. McCusker, (groc.)	2.68
Henry Baer, P. M. Mich. N. M.	458.75
Wisconsin Telephone Co., Appleton	3.45
Captain Wm. Bearder, (groc.)	1.75
J. P. Shimek, Appleton, (meals)	17.75
Ass'n Battery A, 1st F. A. (car fare)	5.00
Milwaukee Auditorium Board (rent)	149.68
Major C. R. Williams, (ammunition)	870.81
Captain C. E. Butters, (expense band)	49.30
C. & N. W. Ry. (transportation)	1,819.09
C. M. & St. P. Ry. (transportation)	2,572.08
Total	$7,428.27

EXPENDITURES OF QUARTERMASTER DEPARTMENT.

July 1, 1912, to June 30, 1914.

	July 1, 1912, to June 30, 1913.	July 1, 1913, to June 30, 1914.	July 1, 1912, to June 30, 1914.
Transportation, passenger—			
Camp, W. N. G.	$505 01	$288 38	$793 39
Rifle competition	125 84	95 57	221 41
Schools of instruction	483 64	723 52	1,207 16
Inspections and examinations	571 77	549 84	1,121 61
Rifle practice, companies at home stations	.....	43 19	43 19
Miscellaneous	132 46	483 97	616 43
Total transportation, passenger	$1,818 72	$2,184 47	$4,003 19
Transportation, freight—			
Rifle competition	$5 20	.....	$5 20
Supplies: Quartermaster and Ordnance departments	1,382 20	$1,029 76	2,411 96
Total transportation, freight	$1,387 40	$1,029 76	$2,417 16
Clothing—			
Purchased, special prizes	$10 00	$35 90	$45 90
Total clothing	$10 00	$35 90	$45 90
Telegraph and telephone—			
Western Union Telegraph Co	$2 25	.....	$2 25
Wisconsin Telephone Co	18 00	$18 00	36 00
New Lisbon Mutual Telephone Co	19 00	13 00	32 00
Juneau Electric Co	49 95	87 75	137 70
Total telegraph and telephone	$89 20	$118 75	$207 95
Salaries—			
General J. Hodgins	$996 00	.....	$996 00
Major C. R. Williams	1,800 00	$2,299 92	$4,099 92
Sergeant E. S. Burroughs	720 00	720 00	1,440 00
Sergeant Leo Wilkinson	900 00	900 00	1,800 00
Sergeant E. V. Luck	720 00	765 00	1,485 00
M. P. Curtius	960 00	1,080 00	2,040 00
Alma Olson	720 00	406 00	1,126 00
Leslie Lea	210 00	.....	210 00
T. H. Hanson	.....	300 00	300 00
Total salaries	$7,026 00	$6,470 92	$13,496 92
Camp expenses—			
Material and supplies	$447 90	$434 99	$882 89
Labor	870 26	510 88	1,381 14
Mess, employes, quartermaster and adjutant general's department	221 90	207 05	428 95
Total camp expense	$1,540 06	$1,152 92	$2,692 98
Rifle competition expense—			
National competition, 1913	.....	$232 70	$232 70
Labor	$81 00	119 53	200 53
Mess, employes, quartermaster and adjutant general's department	39 70	80 25	119 95
Total competition expense	$120 70	$432 48	$553 18
Expenses, officers, Q. M. Corps—			
General J. Hodgins	$16 00	$14 20	$30 20
Major C. R. Williams	162 30	.....	162 30
Total expenses, officers, Q. M. Corps	$178 30	$14 20	$192 50

EXPENDITURES OF QUARTERMASTER DEPARTMENT—Continued.

	July 1, 1912, to June 30, 1913.	July 1, 1913, to June 30, 1914.	July 1, 1913, to June 30, 1914.
Printing and postage—			
Printing	$278 49	$346 42	$624 91
Postage	325 00	350 00	675 00
Total printing and postage	$603 49	$696 42	$1,299 91
Quartermaster Corps—			
Supplies, Quartermaster and Ordnance departments	$2,519 11	$3,322 92	$5,842 03
Labor	1,524 32	2,037 30	3,561 62
Total, Quartermaster department	$4,043 43	$5,360 22	$9,403 65
Military Reservation—			
Material and supplies	$2,623 30	$2,715 26	$5,338 56
Labor	2,783 68	2,375 39	5,159 07
Purchase of land	.....	600 00	600 00
Drainage tax	27 07	24 74	51 81
Total Military Reservation	$5,434 05	$5,715 39	$11,149 44
Insurance premiums	.....	$223 12	$223 12
Incidental expenses of troops at Black River Falls	$295 85	.....	295 85
Total expenditures	$22,547 20	$23,434 55	$45,981 75

LOST PROPERTY FUND.

July 1, 1912, to June 30, 1914.

RECEIPTS.

1912.		
July 1,	By balance	$434.76
July 2,	To deposit, State Treasurer, sales	25.00
Aug. 9,	To deposit, State Treasurer, sales	46.00
Aug. 9,	To deposit, State Treasurer, sales	65 00
Sept. 23,	To deposit, State Treasurer, sales	5.00
Sept. 27,	To deposit, State Treasurer, sales	10.50
Oct. 15,	To deposit, State Treasurer, sales	63.00
Oct. 19,	To deposit, State Treasurer, lost property	4.20
Oct. 23,	To deposit, State Treasurer, sales	41.00
Nov. 9,	To deposit, State Treasurer, rebate on bond	15.00
Nov. 9,	To deposit, State Treasurer, sales	4.75
Nov. 13,	To deposit, State Treasurer, sales	20.00
Nov. 15,	To deposit, State Treasurer, sales	53.50
Nov. 16,	To deposit, State Treasurer, sales	1.50
Nov. 23,	To deposit, State Treasurer, lost property	5.35
Nov. 26,	To deposit, State Treasurer, lost property	1.55
Dec. 4,	To deposit, State Treasurer, sales	26.55
Dec. 18,	To deposit, State Treasurer, sales	48.00

1913.			
Jan.	2,	To deposit, State Treasurer, sales	$25.00
Jan.	2,	To deposit, State Treasurer, sales	50.00
Jan.	9,	To deposit, State Treasurer, sales	6.00
Jan.	15,	To deposit, State Treasurer, sales	51.25
Jan.	24,	To deposit, State Treasurer, sales	32.25
Feb.	1,	To deposit, State Treasurer, sales	16.75
Feb.	4,	To deposit, State Treasurer, lost property	29.85
Feb.	5,	To deposit, State Treasurer, lost property	454.45
Feb.	10,	To deposit, State Treasurer, sales	3.00
Feb.	13,	To deposit, State Treasurer, sales	3.00
Feb.	14,	To deposit, State Treasurer, lost property	231.35
Feb.	18,	To deposit, State Treasurer, lost property	192.07
Feb.	22,	To deposit, State Treasurer, lost property	32.39
Feb.	25,	To deposit, State Treasurer, lost property	93.96
Mar.	4,	To deposit, State Treasurer, lost property	6.06
Mar.	7,	To deposit, State Treasurer, sales	12.50
Mar.	11,	To deposit, State Treasurer, lost property	125.37
Mar.	14,	To deposit, State Treasurer, sales	28.00
Mar.	15,	To deposit, State Treasurer, sales	5.00
Mar.	25,	To deposit, State Treasurer, lost property	350.86
Mar.	31,	To deposit, State Treasurer, sales	5.00
Apr.	7,	To deposit, State Treasurer, sales	36.00
Apr.	9,	To deposit, State Treasurer, lost property	95.52
Apr.	17,	To deposit, State Treasurer, sales	111.50
May	3,	To deposit, State Treasurer, lost property	143.78
May	10,	To deposit, State Treasurer, lost property	25.60
June	19,	To deposit, State Treasurer, sales	50.00
June	20,	To deposit, State Treasurer, lost property	307.32
July	10,	To deposit, State Treasurer, sales	28.50
July	21,	To deposit, State Treasurer, sales	4.50
Sept.	18,	To deposit, State Treasurer, sales	53.23
Oct.	11,	To deposit, State Treasurer, sales	65.00
Oct.	18,	To deposit, State Treasurer, sales	1.00
Nov.	1,	To deposit, State Treasurer, lost property	1.87
Nov.	8,	To deposit, State Treasurer, lost property	7.00
Nov.	12,	To deposit, State Treasurer, lost property	4.50
Nov.	17,	To deposit, State Treasurer, lost property	1.18
Nov.	18,	To deposit, State Treasurer, lost property	2.00
Dec.	8,	To deposit, State Treasurer, lost property	39.50
Dec.	18,	To deposit, State Treasurer, lost property	8.25
			$3,611.02

DISBURSEMENTS.

1912.			
July	5,	Supplies purchased from Quartermaster Corps, U. S. A.	$97.75
July	5,	Stores purchased from Ordnance Department, U. S. A.	77.75
1913.			
Mar.	22,	Supplies purchased from Signal Corps, U. S. A...	1,180.00
Mar.	22,	Supplies purchased from Goll & Frank.....	30.63
Apr.	1,	Supplies purchased from Quartermaster Corps, U. S. A.	726.61
Apr.	21,	Stores purchased from Ordnance Department, U. S. A.	400.42
Oct.	15,	Stores purchased from Ordnance Department, U. S. A.	348.80
Dec.	22,	Shoes purchased from J. M. Herman & Co.	432.25
		Total Disbursements	$3,294.21
		Balance to credit of fund July 1, 1914	$316.81

SYNOPSIS OF GENERAL ORDERS AND CIRCULARS.

FROM

JANUARY 1st, 1912 TO DECEMBER 31st, 1913.

General Orders No. 1, January 1, 1912, publishes list of men dishonorably discharged during preceding six months.

General Orders No. 2, January 23, 1912, announces dates of the inspection of the W. N. G. by officers of the U. S. Army.

General Orders No. 3, February 24, 1912, announces scheme for instruction in gallery practice and ammunition allowance.

General Orders No. 4, March 7, 1912, Manual for examination of non-commissioned officers.

General Orders No. 5, March 14, 1912, figure of merit, firing Course "C".

General Orders No. 6, April 2, 1912, repeals authority for one year enlistments.

General Orders No. 7, April 3, 1912, Camp of instruction of officers at Camp Douglas, May 27th, to 29th, 1912.

General Orders No. 8, April 10, 1912, Uniform regulations and allowances.

General Orders No. 9, June 18, 1912, announces dates and regulations for camps of 1912.

General Orders No. 10, June 18, 1912, announces dates and regulations for Rifle Camp, 1912.

General Orders No. 11, June 19, 1912, Standing of officers in Correspondence School work.

General Orders No. 12, July 1, 1912, publishes list of men dishonorably discharged during preceding six months.

General Orders No. 13, September 18th, 1912, Regulations relative to physical examination of officers.

General Orders No. 14, October 2, 1912, relative to efficiency reports of officers.

General Orders No. 15, October 10, 1912, Report of annual inspection and award of prizes.

General Orders No. 16, October 15, 1912, Regulations for correspondence school for 1913.

General Orders No. 17, October 21, 1912, consolidation of Quartermasters, Subsistence and Pay Departments.

General Orders No. 18, Nov. 15, 1912, figure of merit firing Course "C" and award of National Defense Trophies.

General Orders No. 19, December 21, 1912, Visits of tactical instruction by Captain R. H. Wescott, Infantry, U. S. A., Inspector-Instructor.

General Orders No. 20, December 23, 1912, visits of inspection and instruction by field officers.

General Orders No. 1, January 2, 1913, publishes list of men dishonorably discharged during preceding six months.

General Orders No. 2, January 10, 1913, company armorers.

General Orders No. 3, January 16, 1913, announces dates of inspection by officers of the U. S. Army.

General Orders No. 4, February 1, 1913, course of rifle firing for organized militia.

General Orders No. 5, February 5, 1913, retirement of Colonel John B. Edwards, Surgeon General.

General Orders No. 6, March 1, 1913, targets for Course "C", instructions relative to pistol and rapid fire.

General Orders No. 7, April 24, 1913, Camp of instruction for officers.

General Orders No. 8, April 24, 1913, announces dates and regulations for camps.

General Orders No. 9, April 26, 1913, dates and details for Rifle Camp.

General Orders No. 10, May 1, 1913, allowances of Small Arms ammunition.

General Orders No. 11, May 1, 1913, clothing and equipage for enlisted men.

General Orders No. 12, May 1, 1913, arms and equipment for enlisted men.

General Orders No. 13, May 5, 1913, visits of instruction by Regimental Inspectors of Rifle Practice.

General Orders No. 14, July 1, 1913, list of men dishonorably discharged during preceding six months.

General Orders No. 15, August 16, 1913, acts of legislature of 1913 relative to W. N. G.

General Orders No. 16, August 16, 1913, retirement of General J. Hodgins, Quartermaster General.

General Orders No. 17, September 22, 1913, report of annual inspection and award of prizes.

General Orders No. 18, October 1, 1913, appointment of General Orlando Holway, The Adjutant General and Colonel Gilbert E. Seaman, Surgeon General.

General Orders No. 19, October 1, 1913, retirement of General C. R. Boardman, The Adjutant General and Colonel E. H. Grannis, Surgeon General.

General Orders No. 20, October 15, 1913, regulations for correspondence school for officers.

General Orders No. 21, December 1, 1913, property inventory by company armorers.

General Orders No. 22, December 6, 1913, figure of merit Course "C", 1913.

C. P. GOODRICH

FORTY-FIRST ANNUAL REPORT

OF THE

WISCONSIN

Dairymen's Association

HELD AT

Ashland, Wis., December 10, 11 and 12, 1912.

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, WISCONSIN
DEMOCRAT PRINTING COMPANY, STATE PRINTER
1913.

OFFICERS.

President,
E. C. JACOBS,
Elk Mound, Wis.

Vice Presidents,
A. D. DELAND, Sheboygan, Sheboygan Co.,
President 1877.

W. A. HENRY, Madison, Dane Co.
President 1890.

W. D. HOARD, Fort Atkinson, Jefferson Co.,
President 1891–3.

C. H. EVERETT, Racine, Racine Co.,
President 1894–5.

G. W. BURCHARD, Fort Atkinson, Jefferson Co.,
President 1896–7.

H. C. TAYLOR, Orfordville, Rock Co.,
President 1898–9.

C. P. GOODRICH, Fort Atkinson, Wis.
President 1900–1.

J. Q. EMERY, Madison, Wis.
President 1901–3.

CHARLES L. HILL, Rosendale, Fond du Lac Co.,
President 1904–5.

W. J. GILLETT, Rosendale, Fond du Lac Co.,
President 1906–7.

F. H. SCRIBNER, Rosendale, Fond du Lac Co.,
President 1908–9.

H. D. GRISWOLD,
West Salem, La Crosse County,
President 1910–11.

Secretary,
A. J. GLOVER,
Fort Atkinson, Wis., Jefferson Co.

Treasurer,
H. K. LOOMIS,
Sheboygan Falls, Sheboygan Co.

CHESTER HAZEN, Ripon, Fond du Lac Co.,
President 1872–74. Died 1900.

HIRAM SMITH, Sheboygan Co.,
President 1875–76. Died May 15, 1890.

H. F. DOUSMAN, Waukesha Co.,
President 1878.

Z. G. SIMMONS, Kenosha Co.,
President 1879.

C. R. BEACH, Walworth Co.,
President 1881–82. Died September 15, 1893.

W. H. MORRISON, Walworth Co.,
President 1883–86. Died December 15, 1893.

H. C. ADAMS, Dane Co.,
President 1887–89. Died July 7, 1906.

STEPHEN FAVILL, Dane Co.,
President 1886. Died ——, 1906.

LETTER OF TRANSMITTAL.

WISCONSIN DAIRYMEN'S ASSOCIATION,
Secretary's Office.
FORT ATKINSON, WIS. JULY, 1913.

To His Excellency, FRANCIS E. MCGOVERN,
Governor of the State of Wisconsin.

Dear Sir: I have the honor to submit for publication, as provided by the law, the Forty-first 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 Beloit.

Very respectfully,
A. J. GLOVER,
Secretary.

TRANSACTIONS

WITH

ACCOMPANYING PAPERS AND DISCUSSIONS

OF THE

Wisconsin Dairymen's Association

AT THEIR

Forty-First Annual Convention

Held in Ashland, Wis., Dec. 10–12, 1912.

President E. C. JACOBS in the chair.

Prayer, REV. MR. JORDAN, Ashland.

ADDRESS OF WELCOME.

DR. J. M. DODD, MAYOR OF ASHLAND.

Mr. President of the Wisconsin Dairymen's Association, Ladies and Gentlemen:' It indeed affords me a great deal of pleasure to extend the hand of welcome to the Association and I will not stop at that, I will extend both hands; in fact, I would rather receive you with open arms, and I am sure I represent the sentiments of our people when I speak in this way.

Those of us who have lived in this community for the last quarter of a century, have watched the growth and development of this section with a great deal of interest, and in fact so great is that interest that our lives are wrapped up in the proposition and our destinies are cast with those of the country. When I

came here, I came from an agricultural section of the country, having lived on a farm when a boy, and I missed the evidences of farm life very materially. The plow was something I did not see here for a long time, and I almost forgot what a mowing machine looked like, but those things have become very important implements and influences in our daily life in this section of the country.

First, the lumberman came and reaped his crop with success, but he left behind him desolation. Now the farmer has come and he is converting the choppings into fertile fields, he is reaping annual crops and his land will continue to yield indefinitely. I can remember a few of us who came up here, had been accustomed to having gardens at home, so we planted a few hills of potatoes in our back yards. We had been told emphatically that we could not raise anything on this red clay, but we were surprised to find that the potatoes grew very well. We soon noticed that along the tote roads in the woods, clover began to spring up, and it grew as we had never seen it grow anywhere else. A few of the more energetic and hopeful farmers cleared up a little land and they found it was productive, that they could grow almost anything they planted on it if they took proper care of it. So it went on and on, until we find now that we can grow here, about as well as they can anywhere else, almost any of the things adapted to this climate. We have tried various crops; there is no trouble in making a success of growing potatoes in certain kinds of soil, we can raise corn under certain conditions for certain purposes, but we find we can raise clover better and more profitably than anything else, and that brings us to the subect of dairying.

A few years ago people kept but few cows; and struggled along with them through the long winters by feeding and caring for them as best they could, but it was not a very promising industry. Along comes the silo and it simplifies the matter of feeding cows, and makes winter, the heretofore unproductive and expensive season, the one most productive.

I trust your meeting will be very profitable. Thank you.

RESPONSES.

Mr. C. P. Goodrich, Fort Atkinson.

Mr. Mayor, Citizens of Ashland and Mr. Chairman: I am glad to come here because I know we are welcome, and that makes me feel a great deal better than to go where I am not welcome, because I tried that from 1861 to 1865. Some of the time I was trying to go where they didn't want me, and I can tell you there wasn't a bit of fun in that.

We are here to talk over dairy matters. Now, we old fellows who have been at work in the business a great many years and come from the southern part of the state, do not yet know it all by a great deal, so we are here to talk over those things that interest us and to learn from one another. There is no one that knows so much but that somebody can tell him something he doesn't know. There is no one that knows so little but that he knows some things some other fellow doesn't know.

Wisconsin has become the greatest dairy state in the union. It produces more butter and cheese than any other state, and it is growing very rapidly in this respect, but we would like to see it being carried on more profitably than it is.

I came to the southern part of the state over sixty-six years ago. I know for many years the general opinion was that there was more than half of the state that was not good for anything, except to grow trees; it was never supposed it would be an agricultural country; in fact, a good many years ago we never dreamed there was any good country north of us, but I am well satisfied from what I have seen of the northern part of the state that it is going to excel the southern part in the dairy business.

Mr. Charles L. Hill, Rosendale.

I am glad to say I have been to nearly every State Dairymen's Association since 1887, and I never went to one yet that I did not go back home full of enthusiasm to take up the work that the Norwegian calls "yust pulling teats," with a little more enthusiasm than before I went. I never brushed up against any man who was "pulling teats" or was in any way connected with

the dairy industry, but that I learned something from him that I could put in practice on my own farm.

We little realize the magnitude of the dairy industry. We know some things and talk about our particular end of it; it may be from the breeders' or the feeders' standpoint, or it may be from the milk dealers' and it may be from the standpoint of the dairy machine men, or the men who manufacture barn equipment, but we can hardly imagine anything about the other lines of work.

Wisconsin produces forty per cent of all the cheese produced in the United States at this time, and not only does Wisconsin produce a large percentage of the cheese manufactured, but it produces a larger variety, more different kinds of cheese than in any other state or territory. I am sure it would surprise most of you if you knew how many different kinds of cheese we produce here,—I know it surprised me very much when I looked into the subject a short time ago.

If any of you had the privilege of attending any of the great dairy shows this year, at Waterloo, Milwaukee, or Chicago, you had a pretty good chance to learn considerable in reference to the dairy industry as it is and perhaps is to be. Some of the dairy machinery people took from $3,000 to $5,000 worth of machinery to those shows for exhibition purposes just to give people an idea of the magnitude of that side of this industry. And still we can keep on studying to realize better what there is in it. We are apt to deal in figures to such an extent that they do not mean much. We say, for instance, the dairy industry in Wisconsin brings in eighty or a hundred million dollars a year. It is easy enough to say that, but almost impossible to conceive what it actually means. We can't realize even what a million is. A man attempted once to make a million marks on a sheet of paper in a week. He worked day and night and had to have alcohol dropped on his wrists in order to be able to keep up the work, and he finally failed. Now, if one million means that, what would eighty million mean? This illustration was used in relation to the cost of the drink traffic in this nation, but the figures will apply just as well to our business. If it included the entire number of cattle in the United States, we would have to say about sixty-one million. Perhaps an illustration will bring that nearer home. It is said that if you took sixty-one mil-

lion head of cattle and had them all corraled at Eastport, Maine, and would start West, putting them four abreast on the highway, and go to Seattle, a distance of three thousand miles across the country, and down the coast to Los Angeles and back to East port, Maine, when the first of them got back there, two-thirds of them would not have started. That will give you some idea of the magnitude of the dairy industry in the country and when you think that this industry brings into Wisconsin something like $81,000,000, you may begin to realize something of its magnitude.

On many farms this morning, the farmers got up and lighted their lanterns—if they didn't have an electric plant on their farms,—went to the barn and began to milk their one to twenty cows, as the case might be, and each contributed his little mite to the eighty million dollars. Others contributed a great deal more. I have in mind one farmer who told me that up to the first of December there was $14,000 profit in the milk produced on his dairy farm. He has a little over two hundred cows and receives an average of 31½ pounds per day per cow, and for every quart of milk he received 12 cents. You see cows producing fifteen quarts of milk a day which sells at 12 cents a quart, brings $1.80 each and estimating the average cost of feed for the 200 cows at 26 cents each you can see where the nice profit of $14,000 in eleven months comes in.

Of course very few of us are capable of running such a farm, there are too few of that kind of farmers. The bulk of farmers who make up this $80,000,000 are those who have about ten cows milked by the farmer himself.

A. J. GLOVER, Fort Atkinson.

We came to Ashland not expecting to meet a large number of already successful and well-seasoned dairy farmers, but with the expectation of finding men who were thinking, at least, about the dairy cow, about the relation of dairying to agriculture, and how to get into this work and in the right way. We are here to help these men.

We do not make a great deal of noise about the Wisconsin Dairymen's Association, but I think we are doing good work. We receive the sum of $3,000 a year from the state of Wisconsin

and for every dollar the state puts into our hands, the farmer puts in nearly two dollars more. With that small appropriation of $3,000, we are keeping fourteen men at work the year around for this state. We are here to call your attention to the importance of the dairy industry, and if we do no more than to interest five or six good farmers in each community in the dairy cow and get them started right, I think our work shall have been well done.

Mr. Scribner called to the chair.

President Jacobs: I want to add a word to what Mr. Glover has said. I was not particularly enthused at first with the idea of coming to Ashland. I thought perhaps it was too new up here, not enough farmers, but we received some urgent letters from some of your citizens and so we are here, and I believe we have come where we are wanted. My experience has shown that we can do a great deal more good with a few people that really want to learn that with a big crowd who are indifferent. So I also can say I am glad we came to Ashland.

PRESIDENT'S ANNUAL ADDRESS

E. C. JACOBS, Elk Mound, Wis.

We have met here in Ashland to hold this, the 41st annual meeting of the Wisconsin Dairymen's Association. I trust that we have brought to this meeting, and that it will manifest itself at every occasion, the same spirit of helpfulness, and devotion to the dairymen's welfare, that has been ever present at former meetings of this kind.

The immediate necessity which prompted the organization of this association, and which first engaged its attention, was the lack of transportation facilities, although that was by no means the sole purpose of that loyal band of pioneer dairymen. At that time, Wisconsin had forty cheese factories, no creameries, and the annual income from dairy products was about one million dollars. Compare this with the 1928 cheese factories, 1005 creameries and 19 condenseries in operation in 1910, and our present annual income near the one hundred million mark.

When we consider this rapid growth, and the fact that northern Wisconsin, an empire in itself, is just beginning to demonstrate its value as a dairy section, no man will dare predict the growth of the dairy industry for the next forty years.

While it is not claimed that the Wisconsin Dairymen's Association has been the prime factor in this wonderful development, it has ever been alive to the best interests of the dairyman, I believe, and this belief is the result of personal experience, that the knowledge and inspiration that this association has been able to disseminate, has been the means by which thousands of farmers have been able to better their conditions. It has enabled them and their families to live broader and happier lives.

It is not best for us to spend too much time in contemplation of the past, but rather to earnestly promote the work that has been so well begun.

We need not dwell on many lines of work that took the attention of this association in the past, because much of this is now being done by the Dairy School, the Farmers' Institute, the Cheese Makers' Association, the Dairy and Food Commission, the Butter Makers' Association, etc. These organizations are all direct and legitimate descendants of the Wisconsin Dairymen's Association, of which we are justly proud.

Getting Effective Work Done.

I hope soon to see a better system of organization for governing the activities of all the different agencies that are at work for the upbuilding of agriculture, that a duplication of effort may be prevented, and more effective work be done.

This association, of late years, has given special attention to aiding farmers in weeding out the unprofitable cows of their herds. This has been done not only by showing the necessity of such elimination, but by organizing cow testing associations for the purpose of keeping an individual record of the production of each cow.

The term "weeding" has well been applied to the culling out of the unprofitable animals of the herd. The herd, like a growing crop, if left to itself will result in loss and failure to its owner, whereas with a thorough weeding it will result in profit and success.

The boarder cow is a tax on the dairyman. It is for her that many farmers work hard during the day to provide her with feed, and then they spend part of the night trying to extract a little milk from this beast which if intended for any use by the Creator, was certainly not intended for a dairy cow. She occupies the room in the barn, and eats the food of a cow that would render a profit. She robs the farmer of many comforts and luxuries that would make life easier and pleasanter.

I will not burden you with the evidence which proves the magnitude of the loss caused by poor cows, or rather the difference in profit between the poor cows and good cows. All who have made investigations along this line are agreed that it is great, and that to escape it, it is necessary to know what each cow in the herd is producing.

Not the least advantage derived from a yearly record of each cow is the interest created in better breeding, better feeding, and better care. Many cows that would otherwise be unprofitable are thus made profitable, and others are made to increase their profits.

The subject of cow testing will be taken up at this meeting by the representative of the association who has charge of the work. I know he will be able to give a reason for "the truth that is in him," and I trust that much good will come from his handling of the subject, and the discussions that will follow.

More Cows Are Needed.

The farmers of Wisconsin need not alone to have good cows replace the unprofitable ones, but they need more cows—many more good cows. According to the last census the average number of cows per farm is 9—ranging from 2 in Forest and Oneida counties to 18 in Green county. Ashland county has 3.8 cows per farm.

Although the population of the United States is increasing rapidly, the number of cows is decreasing. We are importing three times as much in dairy products as we are exporting.

The larger cities are reaching out farther each year to obtain a sufficient milk supply, and as it is customary in this territory to veal the calves, few cows are raised. Last year there were marketed in Chicago a half a million veal calves, many of them heifers. I believe a great opportunity is before Wisconsin farm-

ers in supplying the demand for dairy cows that already exists and that is sure to increase. We shall need all we can raise for many years, if the farms that are already under cultivation are to be adequately stocked.

Owing to the direct profits of the dairy business, and to the fact that it conserves the fertility of the soil, as no other system of farming does, it will be found that where dairying is practiced intensively, land is the most valuable. On the Island of Jersey, land is worth $2,500 per acre, and rents for $50 per acre per annum. The Jersey cow is the basis of the business that justifies this extreme value.

Patrons of creameries are especially well situated to make the rearing of dairy heifers a source of profit. However, in order to do this, cows must be kept that are good producers, and a well bred dairy bull must head the herd. The rearing of calves for dairy purposes that are not at least one-half blood of one of the recognized dairy breeds, can not be expected to be profitable and usually will be attended with loss and disappointment.

No small part of the enviable reputation enjoyed by Wisconsin's dairy products and dairy cattle, is due to the care which has been exercised to prevent the spread of tuberculosis among our herds.

State Aid Will Be Withdrawn.

The state has done much in the past to aid in this work, but July 1st, 1913, all state aid is to be withdrawn and dairymen will be obliged to combat this disease, without being indemnified by the state for the loss of tubercular animals. In the interest of the public health, and to protect Wisconsin's greatest industry, I believe that prompt and wise action should be taken to eradicate tuberculosis from Wisconsin herds.

I would call your attention again at this time to oleomargarine legislation. The battle against oleomargarine being sold in semblance of, and for butter, has been waged long and successfully. There, however, remains the same determination on the part of the manufacturers to sell their product in a manner to deceive the consumer, that existed when the war began. It is another case where "vigilance is the price of life." It behooves all friends of the dairy industry, and of a fair deal to aid in de-

fense of the law that protects an honest product from being counterfeited, and assures the consumer of getting that for which he pays.

Much time has been spent in the past in explaining the advantage of feeding silage and urging farmers to build silos. This is no longer necessary, for the value of silage and silos is too well recognized. The question now before us is how to build the best silo, and this will be answered by a man whom you will all recognize as an authority in this matter.

Alfalfa Will Grow in Wisconsin.

We have another subject to bring before you that we believe in as fully as we do the silo, although it is comparatively new to a majority of Wisconsin farmers. I believe that alfalfa is destined to become as popular among dairymen as the silo is at present. Its successful growing is only a matter of knowing the necessary conditions demanded by the plant, and, where they are lacking of supplying them. We hope at this meeting to be able to increase our knowledge of growing alfalfa in Wisconsin and to enlist many converts in behalf of this most valuable forage plant.

In closing, I wish to extend my thanks to the members of this association for the honor conferred upon me and in the name of the association I wish again to thank the good citizens of Ashland for their cordial welcome and for the most effectual aid in preparing for this meeting.

Chairman Scribner: It is my privilege to be connected with the Dairy Division at Washington, of which we are all very proud, and feel that it has done a great deal for the development of the dairy business. As I go through the country I find that Wisconsin is looked to as a model in a great many things, and so we have occasion, I am sure, to be proud of our state and what she is doing along dairy lines. But we are confronted with the question: How can we keep up the reputation we have? We certainly have to work to keep it up, because our sister states are a close second. We do not have to go very far across the line, even in Minnesota, to realize that she is crowding us pretty hard. If we are going to keep on progressing, we have to aim high, aim for better conditions.

Mr. Hill: Mr. Jacobs said that the average cows per farm in Green county is eighteen. That large increase is partly accounted for, of course, by the fact that they farm both sides of the land, so there is twice as much room for a cow as most anywhere else in the state. Some counties in the state average only two cows to the farm. Now, why that difference? Why do they keep only two; and the Green county farmers seventeen or eighteen to a farm? The fact is, those men are dairymen and every one of them is enthusiastic over his work. Their business is largely cheese production, although the condenseries are taking some of the milk now.

Mr. Scribner: I held a farmers' meeting in Green county at one time, and on our program was the subject of silos. The local committee in charge of the meeting said to me, "We do not wish to have the subject of silos brought up here, because we cannot make the kind of cheese we are making with silage." Of course I had to follow the program that was laid down for us, and I told him we should have to talk silo just the same, whether they wanted it or not. I gave the best talk that I could. Of course, there wasn't very much interest taken in it. Four or five year later I received a letter from that same man, saying "We have changed our minds in regard to the silo business; we are going to put up some silos in Green county; we find we can make Swiss and Brick cheese from milk of cows fed ensilage all right." And so a great many silos have gone up in that county; indeed the silo has been a revelation to those men, as it is everywhere we go; the silo is an important factor in milk production.

President Jacobs resumed the chair.

ALFALFA AND CLOVER AS FEEDS AND SOIL BUILDERS.

C. P. GOODRICH, Fort Atkinson.

Mr. President, Ladies and Gentlemen: This subject is the most important that can engage the attention of man; it is what keeps this world alive—the fertility of the soil. I am afraid the United States has started on the road that some other countries started on years ago in destroying their forests, depleting the fertility of the soil, and whenever that is done people are bound to revert to barbarism. You know about the promised land where the children of Israel were going, the land that flowed with milk and honey, well the people that inhabit that country now are pretty near to barbarism.

I am afraid we have commenced the journey on this downward road in the United States, the road that begins to rob the soil of its fertility. Now, this is not necessary at all. A good many men say "I guess I can do as I am a mind to with my own land. I can raise wheat every year and it is nobody's business." But I tell you it is somebody's business. When a man says he can do what he is a mind to with his own land and what he is a mind to do is to destroy the fertility of that land, I say he is mistaken. He is mistaken when he talks about its being his own land. You often see a man strut around boasting, "I own a thousand acres of land." "I tell you, my dear sir, you do not own an acre of land, there isn't a man here that owns an acre of land; it isn't your land, it is God's land. It was here before you came and it will be here after you are gone for your children or somebody else's children, and it is your duty to turn it over to the next generation in just as good a state of fertility as it was when you took it, and if you do not do that, you are a thief and a robber." The fact is we can keep up the fertility of the soil and at the same time feed a very dense population. The fertility of the cultivated parts of China, some of them the most densely populated spots on the face of the earth, is so great that that land is producing just as much as it was three thousand years ago, and it is simply because they keep up the fertility of

the soil even while they are feeding that immense population. Belgium is the most densely populated country in Europe to-day, yet the soil is more productive in Belgium now than it was five hundred years ago.

Men say, how can we do it? We have to raise wheat and certain crops that take lots of fertility out of the soil. But I tell you the soil can be kept up. Certain plants add fertility to the soil and they are clover and alfalfa. Clover has the ability to take nitrogen from the air and has roots that bore into the subsoil and bring up the potash and phosphoric acid and after clover has been raised on land and the roots have decayed in the soil, the land is better than it was before; those decayed roots have added humus to the soil.

Clover grows naturally in this country. But you want to keep on raising clover. If you keep cultivating the land and do not raise clover, after a while it will not be so easy to raise clover.

I know that is so, because it has been so in the southern part of the state. With clover, more than half of the product is below the ground; that decays and makes humus which is plant food, and at the same time it loosens up the soil and makes it capable of resisting drought and less liable to suffer from wet weather, more fitted to hold water to carry it through a dry season. It acts as a sort of a drainage proposition by boring down through the hardpan below.

I can remember twenty-five or more years ago, I bought some land a little way from where I live. It was originally very rich land. It lay pretty level and they harvested good crops of wheat on it. But for forty years that land was cropped to grain right along, one year after another, and never a bit of clover raised on it; no stock kept and no manure put on; and when I bought it, I didn't pay much for it; it wasn't worth much. But I will tell you what I did. The first year I sowed it to grain and seeded it to clover. Well, the grain didn't grow more than six or eight inches, but it happened to be a season that we could get a good catch of clover, and to my astonishment and the astonishment of everybody, that was as good a crop of clover as anybody had about there that year. The fact was, the fertility had been used up in the surface part by plants that had not rooted very deeply, but when clover was planted the roots had gone down and worked the subsoil. Then I plowed the clover under and after

that I got a fairly good crop, and the land has been increasing in value every year since. I kept it four years and sold it for about three times what I paid for it and it is worth three times more to-day. It was simply built up by raising clover on it. I can tell you another thing that clover did for my land. This level land had occasionally a little depression in the surface. When the land was new the water didn't stand there, but after it had been cultivated every little root held water and now the water does not stand in those depressions. the clover roots have gone down through the hard subsoil and decayed and left places for the water to get out.

Now I am going to talk about alfalfa. I have seen it growing in Washington county and it was doing finely there, but it was the opinion for many years that we could not raise alfalfa in Wisconsin. I remember at a farmers' institute near Medina I was talking about alfalfa, and the conductor, a local man, stopped me and said, "We don't want to hear any talk about alfalfa. I have tried it and it was a failure." I want to say to you, last year that man's farm had on it a magnificent crop of alfalfa; it was not a failure when it was handled right. It has failed a great many times. There are some queer things about alfalfa that we have to understand before we can raise it. Scientific people talk about nodules and bacteria. I sowed some alfalfa a few years ago on my farm and it came up sickly, it looked poorly; here and there was a bunch of soft-looking stuff. I couldn't understand it, because the land wasn't poor, but that was the way it acted. I plowed that up and planted it to corn and the following year I sowed it to alfalfa again. The alfalfa was good and I have known of a great many cases where it acted that way. I suppose in the meantime the soil became inoculated with something that it needed.

Alfalfa is different. It lives too long for some farmers, though I suppose that sounds a little queer to some of the gentlemen here, but what you want to do and what you must do to get the best results is to use alfalfa in a rotation of crops. I know some folks will say alfalfa is not applicable to a rotation, but I know it is, because I have seen it used that way. One of my sons has half of his farm in alfalfa. He keeps it in alfalfa three years; then he plows it up and has it in corn two years, the next year small grain and then seeds to alfalfa again.

There is a good deal of discussion about the right time to sow alfalfa, and it does depend a good deal on the locality. We used to sow it early and it has happened that when we sowed it in March, it just got nicely started and there came a heavy frost which killed it. Then we sowed it with a nurse crop and we thought we got it simmered down about right when we sowed about three pecks or a bushel of barley mixed with the alfalfa and cut the barley for hay, then the alfalfa would go on and do pretty well.

Then we tried sowing it alone and early, but we found in doing that, the weeds would come along too fast; foxtail, pigeon grass and all kinds of weeds would grow very rapidly and get above the alfalfa. We found that when we tried to clip off the weeds, we were apt to clip off the alfalfa, and that didn't work very well. Then finally, there was one man who had a fine stand of alfalfa. We drove five or six miles to see him, and he had a beautiful stand of alfalfa about the last of July. We asked him how he did it, and he told us he plowed the ground early, in April, and pulverized thoroughly. He wasn't ready to sow his alfalfa, so he harrowed the ground. He didn't put his alfalfa seed in then, but he kept cultivating that ground every week or so, until all the weed seeds had had a chance to germinate and he got them all killed off. It was the 24th day of June before he sowed and everybody said he was a fool to put it in then, but do you know, he had a magnificent stand of alfalfa. He had killed all the weeds and got a big crop.

I have been in southwestern Missouri and Kansas and I found alfalfa raised there, but it is sown in the fall, in September, after a crop of wheat or oats has been cut. They plow the ground and cultivate it thoroughly so as to keep down the weeds—you have to do that. Then they sow it to alfalfa and it does well, but whether that plan would work so well in the north, we don't know. I know they have tried it in the southern part of the state, and I haven't heard of any failures.

In western Iowa, near Sioux City, where one of my sons and my brother live, that is the way about all of them do it; they raise a crop of barley, then plow the land and harrow it a few times after the weed seeds begin to sprout and after the first of September, sow alfalfa.

I do not know that you can raise alfalfa in this part of the state, but I know if I lived here, I would try it, and I would try

it thoroughly, not on a big piece of land, but on a small piece first and see what it would do. If it didn't do well the first year, I would plow it up and seed down again the next year. If it did a little better then, but still not very well, I wouldn't plow it up but I would try it another year. I would keep on with it until I got it to grow. Wherever the soil has been inoculated, it does first rate. You know, in the southern part of the state we suffer with drought sometimes and it is hard to get a catch of clover, and of course, it is hard to get a catch of alfalfa, but when it is so dry that we cannot get a catch of clover at all, the alfalfa will survive; its roots go deep for water.

I want to talk a moment about the time to cut alfalfa, as that is a very important matter and where a great many people make a mistake. Alfalfa grows very rapidly; it starts early in the spring and grows very fast. When it begins to blossom, say, not more than ten per cent of it in bloom, look at the crown of the root and if you see some little sprouts starting, (those are for the second crop, the second cutting) it is time to cut the first crop. In two or three days that field of alfalfa will be growing rapidly again. If you leave it a week longer in warm, growing weather, and these little sprouts have grown maybe six inches, they are sure to be clipped off, and they will have to start from the root again to make the next crop, and it is bad for the plant. I have seen fields cut off that way that looked as though they were dead after they had taken off the first crop, and the crop was not as good either as it would have been if it had been cut at the right time; it was more woody and part of the leaves had dropped off, and of course it set back the second crop considerably. It has to be cut just at the right time. In the southern part of the state, we cut the first crop about the first week in June, then in thirty days the next crop, and in thirty more days another crop. We always expect to get three crops and sometimes four.

DISCUSSION.

A Member—Where would you recommend us to get alfalfa seed?

Mr. Goodrich—We get seed out west in Idaho and Montana. They are more successful raising seed there than we are here. I have known it to be tried in Wisconsin, but without success.

There is a peculiarity about the seed where they irrigate land. It must be dry, that is, not irrigated just before it ripens. I think the trouble with raising alfalfa seed in Southern Wisconsin is a heavy rain is liable to come just at the time you don't want it. At any rate, those who have had experience have found it best to get their seed from out West where they can regulate the moisture.

Mr. Glover—Would you advise farmers in this neighborhood to purchase it from irrigated districts?

Mr. Goodrich—Yes, I would, because I don't know how or where they can do any better.

A Member—Wouldn't the high and dry land of Montana be better?

Mr. Goodrich—Perhaps so, I don't know which would be best. Former Governor Hoard got his from Colorado, didn't he, Mr. Glover?

Mr. Glover—He gets some of it from Montana, but not the irrigated districts, and he believes it is better to get seed from fields which have been irrigated in the natural way.

A Member—Which would be the better way to put up alfalfa, to make it into hay in the usual way, or to put it up as ensilage?

Mr. Goodrich—I wouldn't put it in the silo, at least not in this country where we can raise corn. Your mayor said you could raise corn up here. Corn makes the best silage of any crop we have and we want some dry feed to go with the silage, and alfalfa is the finest kind. I have never seen alfalfa put in the silo, but I have seen clover and it doesn't make real good silage, but corn does. Alfalfa is fine feed for all stock. For dairy cows it is a great ways ahead of any other forage that we can raise, because it has such a large percentage of protein. It contains 11 per cent digestible protein which is a very necessary element in feed for dairy cows. It is also good feed for horses. Yes, I know, I have heard men object before to that statement, but I say it is good for horses, and I can tell you how I know. One of my sons has fed his horses alfalfa hay for fifteen years and that is the only hay they have had all that time. They do very well and they don't need as much grain as they do with other hay. Corn and alfalfa makes a well balanced ration. Of course, I know a good many men object to alfalfa for horses, and I would object to it unless I had somebody that used good judgment about feeding

it, because horses like it so well they will over-feed, and if you allow them to do that and then drive them on the road fast, or require them to pull hard, they are apt to get the heaves just as they will with clover.

A Member—Would you advise pasturing alfalfa?

Mr. Goodrich—Not in this country. Out in the West where the ground is solid and dry it can be pastured all right, but the crown of the root is right on top of the ground and if that is bruised, the plant is injured and it will likely die. If you undertake to pasture it and the ground becomes soft from the effects of rain, the cows tramp it too much and kill the alfalfa. It is also good feed for hogs, especially when it is cut green. It is also good feed for sheep as the sheep men have found out; they hung back a good while on that proposition. George McKerrow, the king sheepman in this state, feeds it to his sheep, and he says it is excellent feed. It is really good for all kinds of stock. It makes chickens lay and it will do you good to see how they will eat it. I had a cousin that used to run it through the feed cutter, cut it up short and then steam it for his chickens.

A Member—Do you cure it the same as you do clover hay?

Mr. Goodrich—Oh, yes, cure it just the same; in fact, it is not as hard to cure as clover hay, because it has a little finer stems. We mow it in the afternoon when there is no dew on it, and the next day after it has wilted, rake it and put it in small bunches. A good many cover the cocks with hay caps, though it will do very well without.

Mr. Currier—Do you pay any attention to the lay of the land; in other words, do you prefer level land, or slopes?

Mr. Goodrich—We put it on all kinds of land and the only kind that refuses to raise alfalfa is low land where the water line is within three or four feet of the surface, or where it is likely to be flooded,—it won't stand flooding. Right below Governor Hoard's house was a field that produced three and four crops every year, but when a wet season came along, and the water settled in the ground, the alfalfa didn't do well; it was sick; and come to find out, the roots were going down into that water. That is the only kind of land I know of that will not grow alfalfa.

Mr. Scott—I wish to state that alfalfa has been grown within 500 feet of this very building for the last seven years. Mr. Mat-

thews, the grocer, sowed it on red clay in June, and he obtained three crops every year until last year.

Mr. Goodrich—This land is just as good for alfalfa as for clover.

Mr. Glover—I want to make one or two statements regarding the value of alfalfa. One is this, alfalfa goes splendidly with corn silage, because alfalfa is rich in protein, and corn silage is rich in carbohydrates; both are important elements for feeding purposes. Feed a dairy cow thirty to forty pounds corn silage daily, and all the alfalfa she will eat, and she will do well. Our best dairy cows require a little grain, but a man can be very independent if he has on his farm a good silo and a good mow full of alfalfa. Alfalfa is not only rich in protein, the material that makes muscle and milk, but it is rich in ash, a material that makes bones.

Another suggestion is this, in feeding alfalfa hay to horses great care should be taken not to feed too much, for not only will they eat too much to interfere with breathing, but too much is apt to cause kidney trouble. The reason is this, that all protein matter taken into any body, whether it be human or horse or cow, is thrown off through the kidneys, and if you feed an animal too much protein, too much work is thrown upon the kidneys and therefore trouble follows. So, be careful not to feed a horse more than ten or twelve pounds a day per thousand pounds of live weight.

Recess to 1:30 p. m.

TUESDAY AFTERNOON SESSION.

The convention met at 1:30 P. M.

A telegram was read from Mr. J. Q. Emery, regretting his inability to be present at the meeting.

THE ORGANIZATION AND MANAGEMENT OF CO-OPERATIVE CREAMERIES.

F. D. CURRIER, Secy. Minn. Dairymen's Assn., Nicolet, Minn.

Mr. President, Ladies and Gentlemen:

I am more than pleased to be with you, the members of the Wisconsin Dairymen's Association, and hope that my coming here may not be entirely in vain but that some hint, thrown out somewhere, may be of some benefit. We have had and expect more very valuable assistance from Wisconsin at our Minnesota dairy conventions and, while I know that my coming here will not begin to repay the deep debt of gratitude due you, I trust that it may at least contribute toward a small portion of it.

With a change in the system of farming from general grain farming to a more diversified system, including dairying, the question of organizing coöperative creamery companies often comes up for consideration. This has been especially true in Minnesota, Iowa and Wisconsin and is being largely followed in states farther west and these creameries, if rightly organized and conducted on sound business principles, foretell a great future for all these states.

The local coöperative creamery, if organized and managed on a sound business basis, is an absolute necessity where the largest returns are desired from the dairy business and is putting millions of dollars annually into the pockets of the dairymen and adding to the general prosperity of the whole people. Show me a well managed and successful coöperative creamery in operation, in any community, and I will show you a generally prosperous and contented people, whether they be on the farm or in the country village.

It has been demonstrated and proved and is being proved year by year, that all other conditions being equal, the closer to the point of production of the raw material the butter can be manufactured, the better the quality of that butter and the larger the returns to the producer; hence the question of proper organization and management is of the utmost importance and, if the creamery is started on a sound business basis and conducted along those lines, failure is an unknown quantity.

The term "coöperative" is much abused and I believe that every state should have a law governing the incorporation of coöperative associations and fees to be paid by them. The law should further provide a heavy penalty for the use of the word "coöperative" by any organization that is not based on true coöperative principles; that is, any company that pays profits on capital stock instead of on patronage, and such a law should be rigidly enforced.

I do not mean by this that stockholders of a coöperative creamery or any other coöperative association should be denied a reasonable rate of interest on money invested; but, aside from that and the actual cost of operation, the balance should be divided pro rata according to patronage.

There are two ways of forming coöperative creamery organizations—a right way and a wrong way. The right way is for the farmers to do it themselves and the wrong way is to let the creamery promoter, whose only interest is from a personal standpoint, do the trick. A plan often followed and one which works out well, is for those most interested to call a meeting of the farmers of a community where such an association is desired and find out if enough farmers—cow owners—are sufficiently interested, to warrant them, from the standpoint of raw material available, in organizing the association.

One of the most important factors and one which should be given first consideration in the organization of a creamery is a sufficient number of cows from which to obtain the supply of raw material, as it takes something more than enthusiasm to keep a creamery in operation. Should it be found that the supply of raw material is not available it would be better to postpone any further action than to make a start only to be followed by failure. This is a point which has been largely, and often

purposely, overlooked by the creamery promoter and accounts for a large percentage of the failures of coöperative creameries.

I have learned from personal experience also that where a creamery company has been organized and the creamery opened for business, operated a few months or perhaps a year or so but in the course of time closed for the reason that there were not a sufficient number of cows to keep it in operation, it is like pulling teeth to again get the farmers interested in reorganizing, even if their herds have increased to that point which would justify them in making a second venture.

They will usually think that they have tried that once, to their sorrow, and do not want a second experience. I would much prefer to organize than to reorganize a creamery that had been prematurely opened for business and later forced to close for want of patronage.

With the average herds in Wisconsin and Minnesota I would not consider it advisable to organize a creamery association, build, equip and open a creamery for business without at least 400 cows within a radius of five miles from the creamery unless, perchance, there was reasonable assurance that the number would be materially increased or that they would be better fed and cared for so as to increase the production per cow.

With the cow question and the question of organization settled in the affirmative, the other considerations to follow should be: the location and kind of creamery building wanted together with cost of same, the number of shares of stock to be issued and the value per share, the cost of the necessary equipment, etc.

It will be found necessary to hold more than one, perhaps several meetings, before arrangements are completed; and at these meetings it would be a good plan to invite some disinterested party from the Dairy Department, who is thoroughly familiar with all details of the business, able to answer any reasonable question that may be put to him, willing to coöperate and render every assistance possible to make the venture a success. It might be a good plan also to invite a manager from a successful coöperative creamery in operation to some of these meetings to relate his experiences, the obstacles he had met with and how they were overcome; or to select a committee to visit some successful coöperative creamery in operation,

as a great deal of valuable information could be obtained through any or all of these agencies and we will often find it better and cheaper to profit from the experience of others than to experiment ourselves.

At some of these preliminary meetings, as early as convenient, the name of the association should be agreed upon and officers consisting of a president, a secretary and manager, a treasurer and three or more directors, should be elected. There should be two considerations in electing the officers, viz., qualification and location. By qualification, I mean reasonable ability, honesty and an interest in the success of the association; and it would be better to select these from different directions from the creamery than for all to be in one immediate neighborhood. Articles of incorporation and by-laws should also be drafted, agreed upon, signed by all members of the association and filed with the secretary of state and register of deeds in the county where the association is to have its headquarters.

The selection of a suitable site for the creamery building, one where drainage facilities are convenient, should always be given consideration before the commencement of the building, as a proper underground system of drainage, one that will take the waste product and wash water away from the creamery building, is of the utmost importance. I have known creamery buildings to be erected on low, level grounds where good drainage was absolutely impossible when, only a short distance away and just as convenient for patrons, there would be all the natural conditions for a good drainage system.

The strength of any coöperative organization will depend largely upon the number of persons interested in that organization and, for that reason, I consider it advisable to make the cost per share in a coöperative creamery low enough so that every patron may become a stockholder and that every stockholder be given one vote at any annual or special meeting regardless of the number of shares held. The cost per share of stock would be governed somewhat by the amount of money necessary to be raised as compared to the number of stockholders available and is usually fixed at from $20 to $25 per share. I would place a limit to the number of shares owned by any one individual as well as to the total number of shares of stock issued.

Should there be any dairymen tributary to the creamery who

do not feel disposed to take stock (you will find a few in most any community) but who wish to become patrons, they should be accorded the same privileges and be paid the same price for butter fat delivered as the stockholder patrons, as it is patronage and not the few dollars invested in stock that keeps the creamery in operation. The only difference that should be made is to give the stockholder a reasonable rate of interest on his investment and a voice in the affairs of the association.

The cost of the creamery building will depend on the size of the structure, the kind of material used and the convenience for obtaining that material and, as this would be governed largely by local conditions, it naturally follows that figures that would apply very closely in one locality might be far from correct in another. The kind of material to be used would also have to be governed by local conditions but, as there is always a certain amount of steam and dampness in every creamery building, I would consider it advisable, where practicable, to select material that will withstand this dampness.

I believe hollow concrete or clay blocks reinforced with brick and a good stone or cement floor, to be entirely practicable in most localities and, while the cost may be a trifle more than for a frame structure it will prove the cheaper in the end. Convenience of operation should always be given careful consideration in the erection of the creamery building and in the placing of the machinery, as a little premeditation and study as to conveniences of operating the plant will be well repaid. In this connection, I would say that the butter maker should be employed and on the ground before the machinery is installed, as he is to operate the plant and should be given some say as to arrangements. The machinery required to equip a creamery will depend upon the prospective amount of business and it is usually a good plan to begin only with what is actually needed, then to install such other machinery as is found necessary.

With the creamery company organized, the creamery built, the machinery installed, the operator employed and everything in readiness for the opening of business, one might conclude that responsibility ended there and then, when the fact is that no patron is exempt from a certain responsibility for the continued successful operation of the creamery. The patrons are furnishing the raw material from which the butter is manufactured and

the quality of the finished product is largely dependent upon the quality of the raw material delivered. Even if one patron delivers bad flavored milk or cream, it will affect the whole churning so that every patron must keep in mind that he is, to a certain extent, responsible for the quality of butter produced.

As the price obtained for butter will be governed by the quality of that butter and, in the coöperative creamery, will affect the price paid to patrons for butter fat, it naturally follows that there is an individual responsibility resting upon each and every patron of the creamery.

The members of the creamery board may have met with and overcome several difficulties in getting the creamery company organized and the creamery started, but their responsibility does not end at that. They should be held equally responsible with the other patrons in delivering a sweet, clean and wholesome quality of raw material and should also be careful in checking up the accounts of the secretary and treasurer.

They should meet once a month for this purpose as they can thus keep things better in hand than by meeting less often. They should authorize the purchase of new machinery when found necessary and should insist on knowing exactly how the finances of the association stand and authorize the payment of all outstanding accounts at the earliest possible date.

We now come to the so-called manager of the creamery who should also be the secretary. He should be the best man available from among the stockholder patrons because, all things being considered, there is no man better qualified to look after the management of the creamery than one who has a financial and personal interest in the business. I have often met with the contention that the butter maker should be manager and believe that to be partly but not wholly correct, as he is not a permanency, has no financial interest in the association and, even though he might be a good all-round creamery man the board might not realize his worth, and this might lead to his resignation for a more lucrative position, when the creamery would be left without either manager or butter maker.

You might say the creamery board could do as Lot did when his wife turned to a pillar of salt—get a fresh one—but the next one might prove a little too fresh to be of any value to the creamery, either as manager or butter maker, when the creamery would

be "up against" rather a serious proposition. I would therefore contend that, all things being considered, it would be better to elect a stockholder patron as manager, he to work in coöperation with the butter maker with a view to the up-building of the creamery and making the highest possible returns to patrons consistent with honesty and a safe business policy.

The manager is supposed to transact the business deals of the creamery and to keep a record of all business transactions. He does not need to be college bred in order to do this, although some knowledge of the fundamental principles of accounting would be necessary and very helpful. He should also possess a large amount of good horse sense and be able to exercise diplomacy and sound business judgment in his dealings with his fellow patrons and others with whom he meets in a business way.

He should not become imbued with the idea that he is as a mountain to a molehill beside his fellow patrons but simply one of them; and should accord to each and every one the same courteous treatment and consideration which he would claim were the tables turned.

As I have repeatedly stated, he should be willing to devote all necessary time, study and consideration to the business to make it a success, as no man can afford to incriminate himself by accepting the responsibilities of a creamery manager and then attending to his duties as such manager in a slipshod, go-as-you-please sort of manner. He must ever keep in mind that it is not only his own personal interest that will be affected through any neglect of his but that the interest of all the patrons and that of the creamery will suffer likewise, only in a greater or lesser degree; while by close attention to all the details of the business with the thoughts uppermost in his mind, how to interest the patrons in becoming better patrons and in delivering a better quality of milk or cream, how to make the creamery a better and more successful creamery; he may become a public benefactor instead of blot to the creamery and the community in which he resides.

He should familiarize himself with the business in a general way, in buying supplies, coal, etc., and in selling the butter. This is a matter of business and should be done from a business standpoint rather than that of good fellowship. It is a very simple and very easy matter to treat all supply men and butter so-

licitors courteously and wrong to treat them otherwise, but when it comes to giving an order for supplies or sending a trial shipment of butter to every Tom, Dick and Harry that comes along, any manager who tries it and figures results will find that he is doing so at quite a loss to the creamery. I do not mean by this that we should tie ourselves indefinitely to any one supply firm, butter house or coal dealer; as it may occasionally be all right to experiment, but with that experiment we should do a little figuring and note results very carefully. This has been my experience and, I believe, that of a number of my fellow creamery managers.

Where there is ample storage room that supplies may be properly cared for, the manager should order them in quantities, provided he knows what he is getting, as by so doing he is given the benefit of reduced prices for large orders and can thus usually effect quite a saving. Another plan also, and one which often works out well, is for neighboring creameries to coöperate in ordering some of the more commonly needed supplies, such as tubs, salt, coal, etc., and making payment pro rata according to the supplies needed.

We now come to the butter making end of it. The butter maker may have come highly recommended and prove to be an A No. 1 all-round good man or he may have, through some source, obtained those same recommendations and still prove to be quite the reverse. It is up to the manager to find out his qualifications and interest in the work. He should know how to check up the work, how to figure the test, yield, over-run and all details in that line; he should note the appearance of the creamery and machinery, whether kept sanitary and in good working condition, or whether there begin to appear signs of neglect.

He should, in fact, learn to discriminate between good and poor work done in the creamery and, when he has learned that very important factor in creamery management and finds that the butter maker is making good, he should not be one of those to hold out against a raise in salary in proportion to his worth. Thousands of dollars are being lost annually and creameries sometimes wrecked through a lack of management and the employment of cheap, go-easy butter makers when, with a change in the system of management and the employment of an up-to-date butter maker, these same creameries could, in the course of

time, be brought back into the rank and file of the most successful. This is a deplorable condition in some creameries but is, nevertheless true. God helps those who help themselves and may He have mercy on some of these so called "creamery managers."

I do not claim that the manager should assume the role of dictator in the creamery, always watching for the slightest opportunity to criticize, find fault or "kick," but that he should learn to distinguish between good and poor work done in the creamery instead of knowing nothing about it and caring less.

He should keep in touch with dairy officials, both state and national, reporting to them the true condition of the business as it is their mission not to criticise but to help, and they will gladly render every assistance in their power. He should keep his accounts balanced with the bank through which he is doing business, at least once a month, and, should there be any difference, he should endeavor to locate it at once and not put it off to some more convenient time. He should attend to all business matters promptly and always have the checks ready for the patrons at the specified time. He should cheerfully correct any error which may have occurred and, should an error be claimed which did not occur, he should be prepared to submit figures by way of proof. He should above all things be honest and at the end of the year his accounts should balance to a cent.

(Continuing) I want to say another word on the salary question. We have in Minnesota, and I believe the same conditions exist in Wisconsin, a large number of butter makers who are working for a low salary, but still getting more than they are worth—we have entirely too many of them. We have other butter makers that are well paid, but in many instances I believe the creamery man could afford to give them a still further raise. It is not a question so much of salary as it is what the butter maker is actually doing. If he is earning his salary, do not begrudge him a good one, and if he is not earning his salary, it is up to the manager to find it out, and to replace him.

DISCUSSION.

A Member—Will these rules you have given apply to a cheese factory the same as a creamery?

Mr. Currier—Personally I have had no experience with the cheese factory. I think, however, it works on the same principle,

so far as wages, and management and the drainage is concerned, and in fact most of the principles I have attempted to bring out.

Sec. Glover—The only difference would be you could start a cheese factory with half the number of cows.

A Member—Yes, that has been our experience. We found we couldn't get milk enough for a creamery but we could for a cheese factory business, and have done very well.

Mr. Goodrich—It has been truthfully said that if one or more patrons furnish milk to the creamery that is not first class, it affects the whole product. Now, then, Mr. Currier, what do you think of the proposition of grading the milk? Have the butter-maker or some inspector grade it the same as they do at West Salem. They had a very successful coöperative creamery, but some men would not bring first class cream so they had two vats to put cream into, one for the best cream and the other for the inferior cream. Each was churned and marketed by itself and those whose cream went into the poor vat did not get so much money as the others. Isn't that a pretty good way to do it?

Mr. Currier—Yes, that is a good way if it can be carried out. I don't know that this system of grading could be carried out, because where a coöperative creamery is in close competition with the centralizing systems, they are right after this poor cream as well as the other, in fact, they will pay a premium for it and make it up on the other fellow at some point where they haven't such competition.

The Chairman—Will not the local creamery be better off in that instance to have the poor cream taken away?

Mr. Currier—I believe they really would be; I believe in most instances with most creameries the grading proposition could be carried out successfully, but the better suggestion is that they take in no poor cream under any conditions. If the big concerns want that cream, let them have it, and let the coöperative creamery insist on a good quality of cream, so that every patron will be encouraged, and, if possible, forced to produce at all times first class cream to make first class butter. In one of our counties, where a creamery was started on the hauling system it was found they were not producing the quality of butter they ought to. We organized a whole milk creamery and for several years such a creamery was conducted very successfully. Finally the hand separator came into use, and one patron after an-

other commenced to use it and of course that left less milk to be hauled and it had to be done by a few. Now, our by-laws are drawn up in such a way that we could not accept hand separator cream. The patrons came to me as manager and wanted to know if we couldn't make some arrangement to get around that. I told them the conditions exactly and said, "Do not get prejudiced against the creamery, we don't want to turn you down. As soon as the hand separator becomes strong enough, we will call a meeting and endeavor to change our by-laws." Well, more separators kept coming along and the sentiment steadily grew stronger; by separating at home they felt they could deliver to the creamery a great deal easier, with less hauling. We noticed that a rainy season had a tendency to rapidly increase the use of the hand separator. Finally, we called a meeting. Of course there were a certain number of patrons who thought nothing but whole milk would do, and they wanted us to turn down the separator proposition, in fact, some of them went amongst the patrons of the creamery and urged them to by all means avoid the use of the separator. The butter maker called me to the phone and said he would like to have a talk with me before the meeting. He said, "We are going to have trouble, I am sure of that, and before there is any chance for any serious complications, I would like to have you come to that meeting and explain the situation as best you can." I told him I would do the best I could and as soon as the meeting was called to order, I explained the conditions, told them what I considered necessary in order to receive cream and that we should make the same regulations to govern the quality of the cream as were governing milk patrons; in other words, that we should accept nothing but that was first class. I also stated it would be necessary to build a storage room. The first vote taken was on the storage room, and after awhile they voted to accept cream, subject to the same conditions which had held good in accepting milk. The first person who went out to get votes against this proposition voted for it himself after he thoroughly understood it. Then another problem came up; some of the patrons that had hand separators began to be a little bit careless. They thought if they could keep their cream two days, it would be easier work, so they kept it two days and it came in in good condition. Two days' old cream well taken care of in a cool

place, or in cold water, is all right for making butter, so the two-day hauling was all right. But some of them began to think they wanted to delay it a little longer, and thought if two days was all right, three days, or possibly four, would work and they acted accordingly. So we called a meeting of the different creameries of that county and undertook to coöperate on the grading proposition. We made a difference of two cents per pound between cream that was perfectly sweet, graded as No. 1, and that which showed any signs of acidity, which was graded as No. 2. We also decided that if it was sour or spoiled, it was to be rejected, just the same as our old by-laws provided for in handling milk or cream. This has worked out very successfully, and it has given patrons a little warning. If they are inclined to be a little careless in taking care of their cream and delivering it so that it begins to show at least a sign of acidity, maybe just on the point of turning sour, their cream is graded No. 1, and they get two cents per pound more than the man who brings cream which is sour. Of course, difficulties arise sometimes, but we show them how it worked in handling whole milk, and the reasonableness of applying it to cream, and they agree to the plan. At one time there were a dozen or more dairymen who should have been patrons of our creamery but were shipping to the cities, but I am pleased to say there is not one of that kind now and we are grading according to quality and not selling any butter not right up to the mark.

Mr. Sanborn—I just wish to state that the law in this state passed in 1911, provides a severe penalty for the use of the word "coöperative" unless organized under the law that provides for a division of the profits, not to exceed six per cent to the stockholders and the balance divided according to the product, and as I remember, the nonmembers to get one-half of that.

Mr. Currier—That should be followed in other states.

THE FEEDING AND CARE OF THE DAIRY COW.

F. H. SCRIBNER, Rosendale.

The feeding and care of dairy cows is the most important of all the dairy business, for without good feeding the best development of the dairy cow cannot be obtained, nor the best financial results reached. The art of feeding should be learned before one launches out much into the breeding business. A good feeder as a rule will make a good breeder. I have seen so many failures where men, who have had very little knowledge of the feeding end, have started in to breed up a dairy herd. I have in mind one man who now has his fifth or sixth pure-bred sire, and his herd graded up to near full bloods, but they are about the scrubbiest lot of cattle I ever saw, simply because he neglected the feed end of the business. The dairy cow is rather a sensitive proposition and expects kind treatment and regularity in all her dealings, and to disappoint her is as bad as to poorly feed her. The dairy cow of to-day has of necessity got to be a better machine than one that satisfied our grandfathers years ago. She has to meet the demands of a higher cost of living and the changed conditions that have come upon us in the last quarter of a century. Good bran used to be dumped into the Fox river; corn sold for 15 to 25 cents a bushel and good hay from 6 to 8 dollars per ton. The proposition that confronts the dairyman to-day, and in many cases with no better cows than were had years ago, is, how shall I feed for better results.

In the first place, let us try to make it as easy for the cow to give milk as possible. We know if we run a lot of tough grain through a threshing machine, it is hard on the machinery and not very good results can be obtained and no money is made, and it is a good deal so with the dairy cow. A good share of the roughage we ask our cows to eat is enough to break the concave and knock all the teeth out of the cylinder.

It should be the aim of every dairyman to raise all the roughage possible. This is the foundation on which to build a ration, and is the economical part as well. It is important in planning a ration to have it bulky and yet to be as free from indigest-

ible material as possible. Bulky rations are more digestible and more easily assimilated and for this purpose corn, clover, and alfalfa are particularly adapted and combine in themselves almost a perfectly balanced ration.

The manner in which they are prepared is of great importance. Nothing can take the place of the succulence or the natural juices of plants. It aids digestion and makes it possible for a cow to handle more feed and with far less injury to her digestive machinery. So it stands us in hand in the securing of our crops to harvest them with this in mind. Make the work as easy as possible for the old cow and plan to grow plenty of clover and alfalfa, because these plants contain that protein for which we pay high prices and is the element we must have if a good maximum yield of milk is to be obtained. If these crops are cut in the early blooming stages and secured without much damage by rain or loss of foliage, they are easily digested and very palatable.

Corn in most places is the standard crop, or the one from which we get the largest amount of feed per acre and the feed that all stock eats with a relish, and with the modern way of handling through the silo, we are able to preserve it in all its freshness and in such a way as to utilize it the entire year, thereby making summer conditions all the year around. Cows that have no succulent roughage usually require more grain to produce the same results with silage or roots. With these feeds described we have the foundation for the successful feeding of cows.

The grain portion of the ration is the most complicated of the feeds to arrange, for there are so many things to be taken into consideration, and here is where the good judgment of the feeder must show itself. He must have a knowledge of the analyses of feeds, know something of their digestibility as well as palatability, and then the likes and dislikes of his cows has to be considered for they will do best on what they like best.

In balancing a ration it is not always best to try and make a complete ration of the grains we grow on our own farms, although in a way it would be more satisfactory because we would at least know what they were made of, but often times these feeds make the ration too expensive and by exchanging for other

good feeds on the market we would be able to lower the cost of the butter fat 2 or 3 cents a pound.

As a rule, the bulkier the grain portion of the ration, the better, as it gives more chance for the juices of the stomach to penetrate and makes the digestion more complete. In an experiment with corn meal and corn and cob meal, it was found that corn and cob meal gave as good results as corn meal, pound for pound,—not that there was any particular virtue in the cob because of its woody, fibrous nature, but on account of the lightening effect of the feed.

In feeding cows the manger should be divided so that each individual cow will get the ration that belongs to her. If we study our cows we will discover a great difference in them. Not all cows utilize feed as well as others. Some require more and heavier feed to keep their bodily condition right, while others have to be watched not to lay on too much flesh. The cow that is fresh and giving a large flow of milk should be fed correspondingly a larger ration, also the young heifer in her first milking year should receive a good generous ration, as she is trying to perform three missions: to give milk, to make some growth, and furnish nourishment for her unborn offspring.

There is no fast rule that can be laid down for the amount of feed to be fed daily, in fact it would be hard to tell unless the feeder had some idea of the amount of milk each cow gave, as well as the test.

The rule that prevails nowadays is to feed 1 lb. grain for each 3½ or 4 pounds of milk testing from 3 to 3.5% fat, and for cows giving milk testing around 5% fat, about 1 lb. grain to 3 lbs. milk.

A cow giving 60 lbs. of 3% milk, according to the above rule, would receive about 20 lbs. grain per day. This is getting pretty close to the danger line. Of course a ration like this must be worked up to gradually, the cow watched closely, and the milk scale used. The chances are if she eats it with a relish and is hungry for the next feed, she is all right and with a little experimenting it may be found that by decreasing the amount a few pounds, the same results may be obtained.

I believe in liberal feeding; it not only develops and brings out the best there is in a cow, but is economical as well. We have many instances of where scant feeding is unprofitable, and

as a general rule it is true. Of course a cow may be so worthless that any feed given would be as good as wasted. Many dairymen, in fact, I might say a majority of dairymen feed but little more than a maintenance ration. A cow is similar to a boiler, enough coal may be used to hardly furnish steam to run the engine, while a small quantity more would furnish the power necessary. So with the cow; it is only for the amount given above the maintenance ration that we get anything and this is where the profit comes in.

As protein is the element we are looking for in purchased feeds, it has been advised to buy protein in the feeds where we can get it the cheapest. This rule does not always apply, as some of the feeds containing the highest amount of protein need to be fed with a great deal of care and without silage or roots as a laxative, often cause trouble.

The care of cows cannot be separated from the feeding; they go hand in hand. A man may spoil the good effects of good feeding by poor care. The dairy cow to be profitable must not be subjected to the cold. The kinds of feed necessary to produce milk are not the heat producing kind, and nature does not supply her with as good an overcoat as the beef animal. The wise dairyman will provide a warm, comfortable stable so that the cow can utilize her feed for the making of milk rather than to furnish heat for the body. A warm stable means economy of feed, and feed is an expensive heat producer.

The stable should be a cheerful place, not only for the benefit of the cow, but for the one that does the work as well. A bright sun-shiney stable is a blessing in every way,—healthier and more pleasant to do the work,—and the feeder can more easily observe any changed condition in the cows or their feeding.

Some system of ventilation should be installed. Changed air means healthier cows; healthier cows means better feeders; and better feeders, better producers, as the milk is made by the blood, and the blood passing back to the lungs can only be purified by the air that is breathed. How essential then that the air be as pure as possible.

The watering place should be convenient and the water of the right temperature. It takes a lot of water to digest feed and keep the digestive tract in an active condition, and as milk is

composed of a large per cent of water, we should try and supply the cow with an abundance of this cheap commodity. Some cows are shy drinkers and should be encouraged to drink more. This may be done by adding salt to the feed; it helps to bring the kidneys into greater activity. I think all cows should receive from ¾ to 1½ oz. salt each day in the feed.

Probably one of the places where we fail most in care is in the autumn or early fall when we are busy with our farm work and hardly realize the short pasture conditions. If we are going to have long period milkers, and by the way, they are the most profitable, we must learn to help tide over these bad places, either by some soiling crop or the silo. The cow can only be made a profitable machine by being kept continuously at work.

DISCUSSION.

A Member: What would you advise as a grain portion of a ration with corn silage and mixed hay?

Mr. Scribner: That means some timothy, which is pretty hard and woody as a rule, and not very good as a milk producer. If you left out the timothy, you would have a little better ration. In order to offset timothy, you have to supply protein feed. Wheat bran has been one of our standard feeds. We are growing cheaper feeds than we can buy, but there is something about wheat bran that keeps the digestive system in good condition. There is oil meal which carries high protein contents. Gluten, a splendid feed, is also very rich in protein. Cotton seed meal, is one of the highest protein feeds we have, but it has to be fed with the greatest care for it has a constipating effect on animals.

A Member: How are potatoes and corn meal as a mash?

Mr. Scribner: Potatoes are pretty starchy, and that means fatty food, and the same is true of the corn meal; they are pretty much of the same nature. Of course there is a lot of succulence in potatoes, in fact, that is the best thing about them for feeding. If I were going to feed vegetables at all, I would rather feed roots, mangels or sugar beets, or something of that kind.

THE CARE OF MILK AND CREAM.

C. E. LEE, Madison, Wis.

The future of the dairy industry of Wisconsin will in a very large measure depend upon the quality of the butter and cheese manufactured. It is with pride that we can all say: "Our state ranks first in the production of both butter and cheese." Nearly one-sixth of the butter and one-half of the cheese consumed in the United States are products of Wisconsin dairymen. It is of interest to note that for every cent per pound that the butter brings it adds $1,000,000 to the state. The quality of Wisconsin cheese ranks first, but it should not be inferred from this that there is no chance for improvement. The quality of the cheese sent to the scoring exhibition conducted by the Dairy Dept., College of Agriculture, University of Wisconsin, has not improved as much as one would naturally expect. The cause of this can partly be placed upon the milk producers.

For one month, 39% of the cheese was criticized as having an unclean, tainted flavor. One of the judges stated that the cheese makers had received milk that was slightly tainted. The cheese made last July and scored at Madison showed that at nearly 25% of the factories where the exhibits were made milk had been received in a more or less tainted condition. At that time one of the judges stated: "Unless the patrons produce a better grade of milk during the season of hot weather and short pastures, the result will be a very poor cheese." The factory operators should examine the milk daily because the farmers will produce better milk when they know that their product is being watched. During the fall months there is a tendency for the patrons to deliver milk to the cheese factories every other day instead of daily. The additional day that the milk is kept on the farm reduces the quality. This was strongly shown by the cheese made in Wisconsin during the month just passed and entered in the scoring exhibitions. The average score for cheese made from milk delivered daily was 92.66 and from milk delivered every two days the score was 90.56, a difference of over two points.

The above statements show that the quality of the cheese is in a large measure governed by the condition of the milk received. It is reasonable to believe that the great majority of the dairymen who produce milk for cheese are producing good, clean milk but there are always a few who are careless and, consequently, they lower the average quality of milk used in making cheese. If it were possible to keep separate and make up the two grades of milk received at one factory and the cheese sold on its merits, one could then estimate what the state is losing annually on account of tainted milk being made into cheese.

What is true of the relation of the quality of milk to the flavor of the cheese is equally true of butter. This has been brought out on several occasions by men who have made a study of their factory conditions. Wisconsin makes a great deal of butter that has a fair quality and some that is exceptionally fine, and a third lot that is not a credit to the state. This difference in the butter is not due entirely to the skill of the factory operator. Nor is it due to the factory equipment because some of our best butter makers are operating well equipped creameries and yet they are not making good butter.

One butter maker was making high scoring butter in a whole milk factory but on account of sickness he resigned. A few months later he took charge of another factory and the first few tubs of butter from this creamery sent to the scoring exhibitions scored considerably lower than the butter he had made at the other factory. After a few months there was a marked improvement in his butter due to better raw material.

The following is a striking example of what good milk will do for the quality of the butter. A young man who had been instructor in creamery butter making at the Wisconsin Dairy School took charge of a creamery. His first exhibit to the scoring exhibitions scored 91.83. His next two months' butter scored 90.83 and 91.50, respectively. His next ten exhibits scored from 93.00 to 95.3 with an average for the ten of 94.25 Comparing his score on the seven exhibits for the first year with corresponding months for his second year, his average score is 93.1 and 94.7.

A letter was written to this man for the purpose of obtaining a statement as to how the improvement was brought about. His reply was as follows: "When I first took charge of this creamery

the patrons carried home buttermilk in the same cans used for delivering milk. This condition was difficult to overcome because it had been the practice for some time. One by one the patrons brought old cans to put the buttermilk in. At the beginning of the second year I took personal charge of the intake. Not a single farmer received buttermilk unless he had extra cans for that purpose. I then wrote to H. C. Larson, 2nd Asst. Dairy and Food Commissioner, requesting that he spend a day at the factory for the purpose of inspecting the milk. This resulted in several cans being discarded and several patrons had their faulty cans repaired. Since Jan., 1912, I have received all of the cream at the intake, mixing it all with the milk and reskimming it. If the cream was too sour to permit mixing it with the milk, it was returned. This resulted in a much better grade of cream being delivered at the factory. I was just as careful a year ago in making my butter as I have been this season. I am positive that the improvement in the butter is due to a better grade of raw material."

The average score of butter made in Wisconsin from cream skimmed on the farm is fully one point lower in score than the butter made from both milk and cream, while the butter made from whole milk is over two points better in quality than butter made from cream alone. Fifty per cent or more of our butter is made from cream skimmed on the farm. Since the whole milk butter will pass in the highest grade and the butter made from gathered cream one grade lower, the loss to the state can be estimated on the following basis: The difference in market quotations on the two grades of butter is very close to two cents and approximately 55,000,000 pounds of butter in this class at two cents per pound is a loss to the state of $1,100,000 annually. This is not counting the value of a reputation for always making good butter. It can be further stated that fifty per cent of Wisconsin butter at the International Dairy Show recently held at Milwaukee was made from farm skimmed cream not selected and the average score was 92.1. This score places the butter in the second grade, while the butter made from non-selected whole milk scored 94.00. These facts are presented to show that there is a great need in our state for a better coöperation of the cream producers and the creamery men. In order that the average quality of our butter may reach a higher standard, it

rests with the dairymen as to whether or not this is to be accomplished.

THE AVERAGE DAIRYMAN CAN PRODUCE MILK AND CREAM OF CLEAN FLAVOR.

It is not a difficult task to produce good milk and cream when the farmer understands more fully some of the factors that must be observed:

1. The cows must be in good health. The barn must be properly ventilated and provided with a floor so constructed that it can be kept clean and sanitary.

2. The feed that the cows consume is not of such great importance as is cleanliness, but it must be understood that there are certain feeds that impart to milk a flavor that from the butter and cheese maker's viewpoint are objectionable. For example, when cows are first turned out in the spring wild onions are consumed and that flavor is imparted to the butter. Certain weeds also produce bad flavors.

3. Milk and cream must be stored in a room free from taints of any kind. During the winter months milk is sometimes left too long in the barn in uncovered cans. Milk cans while in the barn during milking must be kept covered after each lot of milk is poured. When the milking is finished the cans must be taken out of the barn.

4. Cleanliness is of great importance in the production and handling of milk and cream. It is not to be expected that clean milk can be produced if the barn is not kept clean. It would be a great step in advance if the barns were whitewashed at least once a year in the creamery and cheese factory sections of the state as they are in the territories where the condenseries are located. If the cows are not bedded the hind quarters become more or less covered with manure and the milkers are careless; some do not understand why it is necessary to wear clean clothes, milk with clean, dry hands, into a clean tin pail.

CARE OF DAIRY UTENSILS.

5. "Dairy utensils should be made of the best grade of tin and never used for any other purpose. Wooden or galvanized pails are objectionable. See that all joints in the pails, cans and

strainers are well made and filled with solder. Cans with the tin partly worn off are not suitable receptacles for milk and cream because they rust and this condition imparts a metallic flavor to the butter. Utensils that come in contact with milk and cream can best be cleaned by first rinsing with cold water and then washing with a brush and hot water. Washing powder suitable for use in the dairy should contain no grease. Ordinary sal-soda used in small amounts is also a good dairy cleanser. After washing the utensils with hot water rinse thoroughly with boiling water and place them where they will come in contact with the direct rays of the sun. In washing the ordinary five, eight or ten-gallon milk cans, be sure that the inside of the shoulder of the can is rubbed with the brush, as this is the most difficult part to clean. Utensils scalded with boiling water and left in contact with it long enough to be thoroughly heated need not be dried with a cloth. Simply place them where they will drain and be exposed to the sun."

6. In case the farmers skim their milk, it becomes necessary to have a suitable place for the machine. The separator should not be kept in the barn, nor in any other room where odors that are likely to taint the milk, are found. Clean the separator each time after using, as once a day is not sufficient. This is best done immediately after it has been used. Take apart, rinse well with cold water, and then wash all parts of the bowl and tinware in warm water. Never use a dish cloth or soap of any kind but rather use small quantities of sal-soda or washing powder free from grease. After all parts are thoroughly washed, rinse in boiling water and place in the sun. During the night leave all parts in the supply can without putting them together.

A great deal of the tainted butter made from farm skimmed cream has a flavor and aroma that is very much similar to the odor found in a separator bowl that has been left standing unwashed for twelve hours. Sometimes the cream is tainted because the cans used are not in good condition, the seams may be partly open or a portion of the inside of the can is rusty; the can may be old and badly dented. If anything but cans that are perfectly smooth with seams well flushed with solder and inside free from rust are used, tainted cream will result.

7. Cream must be stored in a suitable place in a can that is clean and has a tight fitting cover. It is a good plan to place

this can in a tank of cold water. The tank should be in a milk house but if one has not been built, the following arrangement answers the purpose quite well:

"Make a small water-tight box of two-inch material and of sufficient size to hold all the cream cans necessary in handling the cream. This box should have a tight fitting cover, and be divided into sections by means of rods which will prevent single cans from upsetting when left alone in the tank. The best place for this tank is in the milk house. It may be placed between the well pump and the stock watering tank and in that case another box or small house should be built over it for protection. All the water pumped for the stock should flow through this tank, the inlet discharging near the bottom, which will force all the warm water out first. The overflow pipe should have one-half inch larger diameter than the inlet in order that the water may be freely carried off. The water in the tank should be of sufficient depth to immerse the cans within two inches of the top. Another place that would be suitable for holding cream could be built inside the watering tank, or an ordinary kerosene barrel may answer the purpose. Burn out the oil and bore holes for the water inlet and outlet between the second and third hoops from the top. Make connections the same as for the box, but be sure the inlet water pipe is extended nearly to the bottom. It is a good plan to bore one-inch holes between the first and second hoops from the top and place rods through them, so the cans will not float when partly filled. Shelter this barrel the same as you would the box, remembering to change the water in the box or barrel often enough to have it reasonably cold, so that the cream may be kept at nearly the same temperature as the water from the well."

8. Skim a cream that will test between 30 and 40% butter fat. This kind of cream will give good results for both the producer and the manufacturer. If 40% cream is skimmed, more skim milk will be left on the farm to be fed to young stock than when 30% cream is produced.

9. Too many creameries in Wisconsin are taking in cream that is too old. As a rule when the age of the cream increases, it reduces the quality of the butter. Four times each week in summer and three times in winter is not any too often to have the cream delivered. Milk and cream producers in Wisconsin

are able to do a great deal to assist in placing the quality of the butter on a higher plane, than it is at the present time. Wisconsin butter has improved in quality during the past three years but we are still short of possible perfection.

DISCUSSION.

The chairman: I think in your talk, you said, Mr. Lee, there was a difference of about two cents a pound between the gathered cream product and the whole milk product. Now, I do not believe the farmer is delivering his gathered cream properly. I think there is a deeper reason for this difference, which goes back to the hand separator. I think there is something behind this which has not been brought out.

Mr. Lee—I believe the best thing that was ever done for the state of Wisconsin was the invention of the hand separator. We can make just as good butter out of farm skimmed milk as out of whole milk. The reason of this difference, however, is this; when we delivered whole milk we expected to deliver it seven days in the week in summer and at least four days in winter. When the farmer changed to home skimmed cream, he expected to be able to keep it a week as that would be a great advantage not only in the work of delivering, but he could keep his skim milk at home. I have investigated and found in the factory invariably a pipe connected with the skim milk tank. The only thing a dairyman will steal is skim milk, and in order to get enough the creamery man must mix water with the skim milk. I believe the man who is raising young stock ought to raise them on skim milk produced on his own farm and not mixed with that from many other farms. There is one thing I did not bring out in my paper. We realize that not every farmer can build a milk house, but he ought to have some place where he can keep milk or cream, not connected with the barn. The barn is not the place for keeping it, and you can't have it in the house nor in the cellar without imparting some peculiar odors which you do not want. If you can't do anything else, you can take an ordinary kerosene barrel, burn it out, whitewash or paint it, and put it somewhere near the pump. It will hold a whole lot of cream, all that will be produced on the ordinary

farm in Wisconsin. It will easily hold a ten-gallon can and a small thirty-pound can. Do not empty the cream out of the small can in the morning, but at night. The cost of a kerosene barrel will not exceed one dollar and the necessary pipe fitting will not exceed another dollar. In fixing up this barrel, drill the hole for the inlet pipe just above the last hoop; the outlet is drilled just below the last hoop.

I know of farmers who have fixed up a small arrangement like this and they find it the best kind of a place for keeping cream. In the winter time a small house can be built over it at a cost of not to exceed ten dollars, and it makes a nice place for handling cream.

Another thing: Cool fresh cream thoroughly before mixing with the old. If you pour warm cream in with the cold, there is a much more rapid souring of the product.

Mr. Goodrich—Mr. Lee has said truthfully that he can make just as good butter from separator-gathered cream as can be made from whole milk. I am perfectly sure that is right, but the people making it must take care of the separators and of the cream. We are always talking to the farmer, telling him he must give them better care, but it is pretty hard to get some of them to do it. At the same time the butter maker cannot shove all the blame onto the farmer. I tell you the creamery man has the whole thing in his own hands. I have a friend that built up a creamery and kept increasing it till he got so that the average product for the whole year was 2,000 pounds of butter a day and it was all from separator gathered cream, but he would not take any cream that was not first class, and that is where he had the best of it. Of course the farmers were angry, but he paid three cents a pound more for butter fat than anybody else paid, and I tell you money brings them to it. He had several teams gathering and he would go out himself most every day, first with one team and then with another. I happened to ride with him one day and we came to a house where he usually got cream. There was nobody at home but he knew right where the cream can was. It was down cellar. He looked at the cream and said: "I can't take that cream, it isn't fit." So he wrote on a card that the cream wasn't good, that they had not taken proper care of it. It had not been properly cooled, and the separator had not been cleaned. So we left the cream. The

next day, the cream gatherer asked at this house: "Have you any cream for me?" The answer came, "No, I haven't. You said my cream wasn't good and I know better, I know it is as good as anybody's, and you never need to call here again." "All right," and he went on. For two weeks he didn't call there. Finally, one day he saw the woman looking anxiously, but he drove right along, whistling and looking the other way. After he got by, the woman called, "Say, I had the separator cleaned and the cream is good to-day." Well, he stopped and looked at the cream and it was all right, so he took it. She was getting three, or four, or five cents a pound more for butter fat and she could afford to take care of the separator and the cream.

Mr. Lee—There is one factory in the eastern part of Wisconsin where a new butter maker went in to take charge, a man who had been well trained and who understood his business. He worked with the farmers and got them to do the right thing and the consequence was that factory got $1200 more the second year than they got the year before. Another butter maker told me, "Our contract next year will mean an increase of over $200 a month to our factory."

The Chairman named the following committees:

On resolutions: Messrs. SANBORN, EVERETT and SCRIBNER.

On nominations: Messrs. HILL, GOODRICH and BEEBE.

On auditing the books: Messrs. CATLIN and SCRIBNER.

Adjourned to 7:30 p. m.

THE IMPORTANCE OF CLEAN MILK.

DR. E. C. JACKSON, Ashland, Wis.

Up to the present time, the safeguarding of milk supplies for municipalities has been considered chiefly from the standpoint of the effect that regulation might have upon the commercial interests of those engaged in the various departments of the milk business. That the problem is far too large and too serious to be considered from this standpoint alone, is a fact to which the state and general public is slowly awakening.

Now we build asylums for the diseased; nurseries and homes for the epileptics and idiots; sanatoria for incipient tuberculosis, and places where our dying consumptives may pass their last days, comfortably isolated, which is all very good. We do our best to prevent and cure, but are we not starting at the wrong end? Would it not be better and would our efforts not count for more, if we expended some of our money and more of our time in investigation and prevention of conditions existing at the birth of our future citizens?

In this country, it is the calves that are looked after by our government. The babies have no votes yet. They will wait. The fact that the infant has a money value has not permeated the politics-filled brain of our authorities. The government control of all infants and children of school age, has not yet come, and until the government does have absolute control of its future citizens from infancy, it behooves us to see that they have at least a fair deal.

When a baby is born it wants many things; among others air and food, mostly food. Mother's milk is the only safe nutriment for the little stranger. There is rarely a woman who cannot nurse her infant, but ignorance of this fact may be blamed on attending physicians and nurses, who by hints and suggestions, make the mother believe, after an insufficient trial, that her milk is "not good" for the baby. From 30 to 40 per cent of mothers do nurse their infants, thus leaving from 60 to 70 per cent to be fed on other foods. By far the largest per cent of these other foods is cow's milk because it more nearly approaches mother's milk in all its constituents.

What I am endeavoring to make you understand is this, that you, as milkmen, are furnishing the food that is taken by from 60 to 70 per cent of the babies under one year, and about three-fourths of all the food taken by all children up to five years.

Every day in the year an average of 142 babies are born in Wisconsin. The deaths among children under one year of age average 15 per day. This shows that 10.5 per cent of children born each year die before reaching the age of one year. The average annual death rate does not exceed 12 per thousand gross population, while the death rate for children under one year is 105 for every thousand such children.

It is evident, therefore, that if measures are adopted to reduce the high death rate among infants there will be an appreciable decline in the rate for other groups and in the general death rate. The mortality of babies below one year has been found, not estimated, to be for exclusively breast-fed 6.98 per cent; for those fed on breast milk and artificial food, 9.87 per cent; for those fed artifically,—cows' milk,—19.75 per cent. The cause of this great infant mortality is worthy of serious consideration, especially as 70 per cent of the deaths are preventable. Of the four chief causes of deaths of infants under one year, diarrhoea—the result of insufficient, or bad milk feeding—heads the list as causing more than half. They have been counted by the statisticians, by the parents, and by the undertakers.

This all means that somebody or something should be held responsible for the deaths of these babies, who should live in good health and with good prospects—the "somebody" is the unclean milkman and the "something", his filthy milk. We may even go further than this and claim that the effects of poor, unclean milk are much more lasting to those who survive the dirt. Rose studied 164,000 persons with relation to the diet which had been given in the first year of life, and found that in many respects the deleterious effects of artificial feeding were often quite discoverable in these individuals, and that even in men capable of military service, the difference to the disadvantage of the cows' milk baby was very apparent.

The supposition is not to be taken from the foregoing statements that when we have passed through infancy we have no cause to fear contamination in milk. Our chances are improved as we grow more able to stand it, but we still have to face the fact that bad milk figures largely in the spread of infectious diseases.

Until recently it was thought that tuberculosis could not be transmitted from cow to child through milk. Dr. Park, of the Municipal Research Laboratory of New York has found that 10 per cent of the deaths from tuberculosis among New York children under five years of age, are caused by bacilli of the bovine type. In non-selected cases from the Babies' Hospital, 6⅓ per cent were due to bovine infection. This conclusively

shows the necessity for regular testing of cows for tuberculosis and prompt isolation of those infected.

The importance of clean milk is shown again, very forcibly, by the ease and frequency with which typhoid fever is spread through the medium of dirty, contaminated milk. The United States possesses the unenviable distinction of having a death rate from this filth fostered disease, among the highest of the nations of the world—Spain first, our country second with 288 deaths per million.

A careless dairyman, careless consumers and a case of typhoid fever along the route make a combination that spells an inevitable epidemic of that dread disease.

Recently an epidemic of twenty-eight cases with fifteen additional suspects, occurring on the route of one small dairyman near Philadelphia, directs attention to some interesting points. Typhoid fever is propagated from one case to another and milk is its most perfect medium. The dairyman in question did not have enough bottles to supply his customers along the route, so as he went from house to house, he picked up bottles set out for him, which of course had collected dirt, flies, and miscellaneous filth and filled them from his bulk supply. His first bottle customer had typhoid fever and used as a source of water supply, a spring, the overflow from which was the source of water supply for the family of the next customer, who also bought loose milk from the dairyman. Typhoid fever soon developed in the latter family and soon there were twenty-eight cases in the forty families served by this dairyman, with a possible fifteen who were suspected of having it. The loss of time and money and suffering caused by this epidemic is obvious and need not be dwelt on here, but it certainly serves to call the attention to the criminal carelessness of the individual—the dirty milkman—which makes such a thing possible. This dairyman should have been hauled into court and damage proceedings instituted against him. With the direct testimony that the illness was due to contaminated milk sold by him, the dairyman could be held responsible in no small degree, and when he found his pocketbook touched in this way, he would be more ready to comply with the requirements and see that the milk he sells is clean.

Trask of the Public Health Service has compiled a list of 107 typhoid epidemics in the United States traced to milk.

Some years ago a severe epidemic of typhoid fever, directly traceable to contaminated milk, occurred at Port Washington, of this state, causing 10 deaths out of 100 cases. The milk supply of the city was furnished by three milkmen. Following the line of these distributors we find that one man supplied 90 families. Upon this route were no cases of typhoid. Milk distributor No. 2 was supplying 207 families, with only one case of the disease, the origin of which could not be traced. Milkman No. 3 was furnishing 300 families and upon this particular route 83 cases had developed at the time of this investigation. No. 3 lived a few miles from Port Washington and had several cases of sickness in his family. Members of a neighbor's family were also sick with a fever, but were not distributing milk, however, No. 3 was buying one milking from this family in order to supply enough milk to his 300 customers. The origin of fever in these two families was simultaneous and about two weeks earlier than the first cases in the city—there is not a question of doubt as to these two families being the source of the epidemic. No. 3 milkman is just ten times a murderer and should be treated as such by the state. Infection of milk with typhoid bacilli as far as known, never takes place from the cow itself, always some human agency in the person of some typhoid convalescent, mild case, who either infects the milk directly during the process of collection, or is indirectly the source of infection by excretal contamination of the surroundings of the farm or dairy. Improper disposal of excreta on a farm may lead to infection of milk in many ways, especially through contamination of the well water used in rinsing utensils and through fly infection.

That absolute cleanliness in all departments of milk production and handling is necessary, is again shown conclusively by a widespread epidemic of scarlet fever, occurring in Boston in 1907. During the first 20 days of January, 367 cases of scarlet fever suddenly appeared in Cambridge and neighboring towns. About 84 per cent of these cases were supplied by a single dealer. A milk taster and his daughter, employed by this dealer, suffered from symptoms suggesting scarlet fever. The method employed in tasting was this: plunging a long spoon into the

can to be tasted, lapping the spoon, shaking it and plunging it into the next can. "This spoon was produced from a dirty pocket, was plunged into the milk without washing or without rinsing between the lapping of the spoon and plunging into the next can." There is no good evidence that cows suffer from scarlet fever, hence the responsibility can not be pushed off on them.

Another striking instance of this sort is the outbreak of septic sore throat in Eastern Massachusetts, reported by Winslo Darling, Richardson, and Goodale. This extensive epidemic, which involved more than 1,000 cases and caused 50 deaths was traced clearly to an infected milk supply. From this, Sedgwick affirms that "The greatest lesson of all is the utter inadequacy of milk inspection."

In the later part of December, 1911, Chicago was visited by an epidemic of sore throat, which, for its widespread distribution and severity, was unique in the history of the city. The main source of infection was traced by Dr. Capps to a dairy designated as X by him. Fourteen times as many users of Dairy X milk contracted sore throat as among consumers of other milk. The contamination was traced to mastitis or garget in the cows of Dairy X and a resulting sore throat in most of the milkers and farmers of this dairy. Another farm showed the coincidence of eleven cases of mastitis in the cows and sore throat among all three milkers. The milk from the diseased cows was sometimes thrown away, sometimes saved, "depending on how it looked." The infection was carried to the milk from the milker or directly from the cows. If it was infected from the milker, it occurred in one of two ways. Either by hands soiled with the infection; or by infective droplets discharged from the mouth by coughing, sneezing, speaking, or laughing. Such droplets may float for as long as half an hour and as far as 3 or 4 feet. A slight unconscious cough by the milker who is infected; or well and a "carrier," may be the means of conveying the infection to the milk. It is hardly necessary to add that most bacteria do not remain quiescent when introduced into milk, but propagate a million or more times as rapidly as the proverbial rabbit. Dr. Capps says concerning this epidemic, "I have no accurate way of determining the mortality rate; in all probability about 200 or 300 died."

The seriousness of unsanitary conditions existing in all departments of the milk business is beginning to be realized; the care necessary to obtain a clean milk is being constantly shown by instances such as I have related, and by many others which are occurring almost daily. That milk produced and handled under unsanitary conditions can be clean, is out of the question, absolute cleanliness in every step of the process is essential.

Milk fresh from the udder of a healthy cow is, practically speaking, clean, that is, it contains but few bacteria, particularly if the first few streams of each teat are discarded. The time for contamination, therefore, is during the milking and while the milk is being handled.

The responsibility for unclean milk and its consequence lies primarily, then, with the milkman. None of you care to be held responsible for deaths caused by drinking dirty milk, however, the fact remains that you will not be free from blame until you have exerted every energy in your power towards a cleaner, safer milk.

The responsibility for unclean milk and its consequence lies secondarily with our health officials. That the milk conform to the legal standard of fat content and total solids are the requirements most cared about by health authorities. They overlook entirely the most important part of the supervision: Is the milk from sanitary stables, is it handled as it should be, in other words, is it clean and fit for human consumption?

In conclusion I will read a short editorial from a recent issue of the Journal of the American Medical Association, the ideas of which bear out what I have endeavored to show you by the foregoing statements. It reads as follows:

PLAIN SPEAKING ON SANITARY MATTERS.

As the education of the public progresses in sanitary matters the tendency to criticize officials responsible for conditions that are not as they should be, becomes more pronounced. This is a hopeful sign, and means, inevitably, improved conditions. As examples of plain speaking on these matters, two instances may be cited. The headline over an article in a daily paper published in a large western city reads: "One More Baby's Life Forfeited to the Game of Politics." The article contains

an account of an epidemic of scarlet fever which was traced to a certain dairy. It specifically attributes the death of a five-year-old child to the milk from this dairy, and goes on to say: "The milk inspection department, during the time that a milker at the farm was developing scarlet fever, was playing politics. The inspectors were out soliciting votes among such of the dairymen as lived within the city limits, and had a vote May 21st. On their shoulders is laid the blame for the infection spread through the city."

The other instance also concerns the milk-supply, this time in a large eastern city. The chief inspector of creameries of the state board of health made an inspection of creameries and dairies in the city and found only three out of the twenty-seven that were up to the standard. He stated to the local board of health that he had no doubt that the impure milk was the cause of the death of many infants, and that if the board did not take immediate action the state board would step in and force the local board to do its duty. With all the agitation and legislation concerning milk, it is scarcely possible that milk-producers and distributors do not know the role of impure milk in the production of disease and death in infants. A conscience so defective as to permit such conditions to exist in the face of that knowledge requires drastic criticism and vigorous action to penetrate it and get it in a normal working condition. Fearless speaking by the newspapers and the public will surely improve the health situation.

EVENING SESSION, December 10, 1912. 7:30 P. M.

In High School Building.

Music by Nuhguhmon Club of Ashland High School.

ADDRESS. (Abstracted)

W. H. MYLREA, Wausau, Wis.

The people of Ashland have this week received new honors. In 1871 there was organized in this state an association known as the Wisconsin State Dairymen's Association, and that organization has met every year somewhere within the borders of the state for the purpose of comparing views and disseminating information upon dairy questions, thus not only benefitting themselves, but benefitting their fellowmen. Year after year their good work has gone on. Men of all classes have taken part in their proceedings and to-night they are celebrating the arrival of the Dairymen's State Convention at the northernmost border of the state of Wisconsin on the southern shore of Lake Superior. The county of Ashland is one of the characteristic counties of the state, the transformation scenes which have taken place all through the southern and central portions of our state are going to take place in Ashland county. I may not see it and you may not see it. Our good old friends, Governor Hoard and Mr. Goodrich, have been working a long time on these lines and they may not see it, but there are those here who will see it, will see the redemption of the state of Wisconsin from waste places and see it take its place among the greatest states of all the states in the union.

The soil of this state is practically the same in its general analysis as that of any other state. There are places in the southern part where timber land followed by fire has brought about different conditions, but men like Mr. Goodrich will tell you that the time was when they thought they could not ripen corn in Southern Wisconsin. A man told me about living on a

farm at Fond du Lac at a time when they abandoned the raising of corn because they thought it could not ripen, they thought the climate was against them, but it turned out that it was not the fault of the climate, it was the fault of the men who failed to think enough about the matter to pick out the proper variety of corn. When you find corn adapted to your soil, you will have no trouble at all. To-day that country down there is one of the richest and best counties in the state. In 1883, when I became a resident of Marathon county, we could not raise sweet corn in the back yards of our homes because it wouldn't ripen. Now you will find they are raising just as good corn as is raised anywhere. The very best corn land the chemists tell us comes from the pine choppings in the northern part of the state of Maine. This simply means that Mother Earth is here to do the work that Nature intended she should do. She can produce timber and she can produce vegetables and there is no vegetable necessary to human life that cannot be grown anywhere in the state of Wisconsin.

I wonder how many people in this audience, outside of the men connected with this association, know that the state of Wisconsin produces, ships, and sells more pure seed, grain and vegetables, than all the other states of the Union put together. The pure seed movement that has been inaugurated by the professors of the Agricultural School of this state, has brought about wonderful results. They are selling pure seed grains all through the states, south, east and west of us. Our friends from Fond du Lac county will tell you of men down there who are raising and selling seed grains in an association, and if every bushel of seed does not come up to the standard of that association, any member loses his membership and cannot be classed as a producer of pure seed grains. The Oderbrucker barley has been sold all over the country not only in the United States, but it goes to Europe and Japan and China and even to Africa.

We hear a great deal these days about the high price of meat. The fact is there are nine million less cattle on American soil than there were ten years ago, while there are over 20,000,000 more people to eat meat.

As I sat in the meeting this afternoon, I read what is on the back of the program of this convention. When the association

was organized in 1871, the dairy products of this state amounted to only about one million dollars. Forty-one years later that same product amounts to more than the gold that is mined in the five greatest gold-producing states in the Union. Eighty million dollars comes from the dairy industry. The state of Wisconsin for seventy-five years has been known as one of the great timber states of the Union. At the close of one decade more, it will be known as a practically timberless state. What has become of all the men who have toiled and destroyed this timber, sent the products of these forests to market? They do not stay here; they have not built up any great community anywhere in the state of Wisconsin. They have left burned stumps of trees, a landscape destroyed. They have left no monuments or great works except such as may be found in the growing and strengthening of humanity in certain lines, but they are not the people that come to stay, that remain to make the country blossom and they never will return. The day is coming when they will no longer be known, practically, east of the Mississippi river. Do you realize tonight that the boys that were in this high school building this afternoon are going to live to see the very last forty of stump land in Ashland county sold, and there will be no more cheap land to be sold after that. There is only one crop of land. There is not an acre more within the borders of the United States than there was the morning that Christopher Columbus first landed.

No country or nation ever was great and strong save it lived where green grass grew naturally, just as it does in Ashland county. Talk about the irrigated lands of the west. We have to have something besides water to make even the irrigated lands of the west prosperous. There must go with that irrigation some system of farming which will restore fertility to the land. It has to be fed just as carefully as you will feed high bred cattle. Give them nothing but cold water and they will hardly give you life in return.

W. D. Hoard is not here so I can mention his name. Most of us who have seen him and know his kindly face, realize that he is one of the greatest men ever produced in the state of Wisconsin.

We cannot now tell of any particular thing he did as governor but we know that the work of W. D. Hoard for the last forty years has been the redemption of the state of Wisconsin. Under his influence unthrifty, barren, waste farm land has been transformed into the blossoming fields that we love so much all over the state of Wisconsin. Somewhere back in the minds of men who are realizing his great work is gratitude that no man can measure. In the years to come may he and these others be able to listen and know that their lives were not spent in vain and that many and many a poor farmer who knows nothing of the lives of these men is enjoying the benefits that he never would have known without their work. I thank you.

Adjourned to 10 o'clock next morning.

MORNING SESSION, Wednesday, Dec. 11, 1912.

President Jacobs in the chair.

The Chairman. I cannot tell you how much good it does me to see this group of bright boys here this morning. With many of us our future is mostly behind us, whatever we can learn we have but a short time to use. You boys will have a long time to use what you can learn and to use it for yourselves and for the state.

THE WORK OF THE WISCONSIN DAIRY ASSOCIATION.

H. C. Searles, Fond du Lac.

In reporting the work of the Wisconsin Dairymen's Association, I will take permission to go back to the time this association was organized in 1872, when a small body of energetic, enthusiastic dairymen met at Watertown and effected the permanent organization of the above association. Since its organization it has stood for principles that have made Wisconsin noted for her fine dairy products and well bred dairy cattle.

With this meeting the Wisconsin Dairymen's Association reaches its 41st. milestone, and the good work accomplished

by this organization during these years, cannot be easily estimated. Its far reaching influence has directly or indirectly benefitted every dairyman in the state.

This association commenced in 1884 to send a traveling inspector into the field, and as its funds were increased from the state and otherwise, this plan was followed for several years, sometimes with as many as four instructors visiting cheese factories and creameries. This plan was in fact the means of starting the dairy school. The benefits of instruction were so apparent that the association earnestly recommended the establishment of such a school in order that it might be relieved from this line of work, and devote its energies and funds more directly to the benefits of the milk producer. To this end, also, it not only favored the creation of a dairy and food commission, but has consistently and persistently favored the enlargement of its functions, notwithstanding the fact that in a way these agencies have encroached upon the field which the Dairymen's Association had, as it well knew and confessed, inadequately covered.

It has therefore gladly relinquished the technical work of instruction and inspection, and in recent years has centered its activities on those lines of work connected with the economical production of milk, and at the present time, is chiefly engaged in establishing cow-testing associations, whereby the farmer is encouraged and assisted to weed out of his herd the unprofitable cows, and feed and care for the profitable ones in a more profitable way.

The Wisconsin Dairymen's Association, and those who have been active in its management, take some pardonable pride in its accomplishments and cannot assert to the proposition that it has outlived its usefulness, or that there is no further need for its efforts.

It is confidently believed that the moderate appropriations the association has received have been wisely expended, and have returned a thousandfold profit to the dairy farmers of the state, and through them to the people at large.

REGARDING ORGANIZATION OF COW TESTING ASSOCIATIONS.

The work of testing cows on the farm began in the spring of 1906. Pursuant to this instruction it was determined to make some initial experiments in establishing cow testing associations. Several applications were received, but none of

them seemed to offer sufficient number of dairies or cows to occupy the full time of an instructor in one locality; but after some delay, by combining the applications from the territory northeast of Fond du Lac with others from Rosendale and Eldorado, a circuit was established, and the writer started work of testing in the middle of May. Later in the season, Mr. H. K. Loomis was persuaded to take up this work in Sheboygan county.

There was a demand for more cow testing associations, and in the year 1907 several were organized upon what we term the fifty-cent plan. The work was carried on in the following manner: Each person who joined the association was required to pay fifty cents per cow per year for having the milk tested once a month. It became necessary for each member to weigh and sample once a month the milk of each cow in his herd, and then take the samples of milk to the creamery, where they were tested by the butter maker, who received fifty cents per cow per year for his labor. This system did not work well for in the busy seasons farmers would neglect to weigh and take samples, and after trying this system for a year or two, it was discontinued.

The following table gives the names of places where cow testing associations were organized under the fifty-cent plan, number of members who joined them, and number of cows tested:

Places where organized.	Number of members.	Number of cows.
Rosendale	38	406
East Fond du Lac	54	559
Cottage Grove	20	154
Tomah	22	261
West Salem	14	240
West Depere	25	266
West Bend	32	328
New Franken	18	178
Medford	16	146
Colfax	18	249
Galesville	9	113
Plainsville	9	72
Hetzel	32	260
Oasis	15	142
Pittsville	75	737
Elk Mound	29	369
Menomonie	58	542
Knapp	20	241
Dewey	11	65
Burnett	22	126
Vesper	21	210
Barron	226	2,174
Rusk	26	447
Blaine	31	243
Neillsville	17	283
Lake Mills	22	303
Stockbridge	15	173
Total	895	9,287

In the year 1908 cow testing associations under the dollar plan were organized. This plan has proved very satisfactory to the dairymen of Wisconsin. Associations under this plan have been organized in the following places:

Place organized.	Number of members.	Number of cows.	When organized.	Years in operation.
Whitewater	25	355	Jan. 1909	2
West Salem	25	345	Feb. 1909	3
Tomah	27	296	Feb. 1909	1
Sparta	27	367	March 1909	1
Waukesha	26	386	March 1909	1
Fort Atkinson	24	418	Oct. 1908	4
Rice Lake	29	300	June 1909	2
Briggsville	24	317	March 1910	1
La Crosse	35	550	April 1910	2
Menomonie	24	415	Oct. 1910	2
Bloomer and Eagle Point	26	450	May 1909	3
Winneconne, 2 Ass'n	43	706	March 1910	2
Beloit	23	470	April 1911	1
Waupun	23	342	April 1911	1
Racine	19	447	Jan. 1911	1
Wautoma	30	350	In operation less than a year.	
Cambridge	37	470		
Stanley	26	430		
Mineral Point	27	450		
Darlington	28	300		
Rochester	27	485		
Total	575	8,649		

The first steps taken to organize an association under the dollar plan, is to get 26 dairy farmers to sign a contract pledging themselves to furnish a given number of cows. It is really necessary to place a minimum number that any one man can enter, unless two farmers live close enough together so the two herds can be tested in the one day; the minimum number should be set at 15 to 18 cows which will enable the association to get sufficient funds to hire an instructor or fieldman. The following is a copy of the contract:

"Whereas the said association is to be organized for the principal purpose of providing means for the coöperation of its members in testing milk of their cows periodically, and for the improvement of their dairy interests. And whereas it is proposed by the said Association to engage a suitable person for that purpose as soon as enough subscribers are obtained to warrant said Association to engage such person. We the undersigned members of said Association, each for himself, and not one for the other, severally agree to pay the sum of one dollar ($1.00) a year for each cow set opposite our respective

names to said Association for that purpose. Said fees to be paid in quarterly installments in advance. The first payment to be made as soon as such person is engaged by said Association. Each one of us also agrees to furnish board and lodging for said person for at least one day each month, and convey him to his next place of work, or should said person furnish his own conveyance, each one of us agrees to feed and shelter said person's horse one day each month. Said person shall not work on Sunday, but shall have board and lodging over Sunday at the place he is working Saturday."

After the required number of cows are obtained, then a meeting should be called and an organization formed, constitution and by-laws adopted and officers elected. It is then the duty of the officers, through the aid of the Wisconsin Dairymen's Association, to select a fieldman to take charge of the work.

The man visits each member's herd once a month, and weighs the milk of each cow night and morning, testing the same at the farm. From the weights of milk and test he calculates the amount of butter fat produced for one day, and estimates the amount of milk and fat produced for one month. Then taking the price received per pound of butter fat, he figures the value of such product. He also weighs the feeds consumed by each cow for the one day, and estimates from such weights the amounts fed for the month. The feed is figured at market value. He also figures the cost of producing 100 lbs. of milk, 1 lb. of butter fat, and the returns for one dollar ($1.00) in feed fed. This enables the farmer every month to know what each cow is doing for him. Balanced rations are also figured, and a general discussion is carried on each month between the instructor and farmer as to the most profitable way of feeding and care of the herd.

Several of the dairy farmers have voluntarily admitted that they received information enough through "Feeds & Feeding," to more than pay them for their investment of one dollar ($1.00) per cow; not counting fifty dollars ($50) to seventy-five ($75) saved in locating boarder cows.

Since starting the work of organizing cow testing associations in 1906, 1470 dairymen have belonged to them, and 17,936 cows have been tested for a year.

At the present time we have twelve cow testing associations in operation in the state with 345 members and 5,350 cows. The dairy farmers belonging to these associations are putting $5,350 into operating cow testing associations, while the appropriation from the state to the Wisconsin Dairymen's Association is $3,000 per year. In other words, for every dollar that the state gives, the farmer pays $1.78.

It is not an easy matter to show exactly in a tabulated form what these associations have accomplished. One of the serious drawbacks of our work is to get the dairy farmers to realize the importance of continuing this work year after year. They seem to think one year's work gives them complete information concerning the individual differences of the animals in their herds. Last spring, while starting one of our associations, an incident happened which shows how little the average dairy farmer knows as to the profits or loss in his herd, unless he is keeping a record. After weighing and testing the milk of this patron's 13 cows, and weighing the feed, we found that the cost of feed exceeded the value of the product to the extent of $45.95 for one month. When this patron was asked as to how he thought he stood in regard to profit or loss in his dairy, he admitted that he was quite sure they were paying for their feed. This patron has erected a silo this summer, and not only this one but 25 silos have been erected among the 37 patrons that we have, who belong to this association. It is my actual belief that this state of affairs was brought about by the cow testing association giving them light to see what they were doing.

Mr. J. H. Kelly of Eagle Point, Wis., who has four farms and four herds of cows in the association at that place, writes as follows:

"I have belonged to the Eagle Point cow testing association for three years and must say am well satisfied with the results attained from it. We are milking over one hundred cows at present. It has taught us how to feed and weed out the cows which are not profitable. We feel that the testing association has a good influence, in that it has a tendency to stimulate the interest of the help in the work; as close records are kept, and a sort of rivalry exists as to whose herd will be the best."

Another letter to our Secretary, Mr. Glover, from W. H. Clark of Rice Lake, has the following to say:

"Your letter of inquiry at hand, and I am pleased to reply. Previous to entering the testing association, our average production for three years was about 200 lbs. of fat per cow. The first year of the association we raised it to 308 lbs. of fat per cow. We then entered our entire herd in the Wisconsin Dairy Cow Competition, and made an average of 405 lbs. of fat per cow, placing every cow and two bulls in the Register of Merit.

During all this time the herd remained practically the same, except that heifers were added as they freshened. No culling was done, and the gain was made only by better care and feeding.

Previous to this test, I had sold a party several head of cattle and offered him a cow for $150. The next year after the test was made, I sold the same cow to the same man for $275. Bulls are being sold for from two to three times the price I got before the test, and I sell many more of them.

Since making our official test our average production has held good on the whole.

I could write pages of the benefits of a testing association in a community, but trust this will meet the requirements of your inquiry.

Signed,
W. H. Clark."

The following tabulated statements, showing the increase that has been made in two different associations for three years work, is self-evident of the value of cow testing work.

It must be remembered that the dairymen suffered by the drought during the years, 1910 and 1911, and there was a tendency to limit the amount of grain fed, which had a tendency to decrease the average production.

BLOOMER AND EAGLE POINT COW TESTING ASSOCIATION.

Began test May 1st, 1909, and ended May 1st, 1911.

Summary giving average record of each herd.

	Milk lbs.	Fat, per cent.	Fat, lbs.	Gross returns.	Cost of feed.	Profit.	Returns for $1.00 in feed.
First year's average of all herds	5,000	4.3	216	$63 76	$30 95	$32 81	$2 06
Second year's average of all herds	5,434	4.1	226	68 34	40 00	28.38	1 70
Gain	434	.....	10	.....	.....	.....	.....
First year's average of one herd	3.854	5.3	204	60 26	34 29	25 97	1 75
Second year's average of same herd	5,399	5.0	273	82 82	44 19	38 63	1 87
Gain	1,545	.....	69	.....	.....	.....	.....
First year's average of one herd	4,981	4.2	209	61 46	33 56	27 90	1 83
Second year's average of same herd	6,622	4.0	269	80 94	43 42	37 52	1.86
Gain	1,641	.....	60	.....	.....	.....	.....
Average amount of gain for all herds	434	.....	10	.....	.....	.....	.....
Average amount of gain for one herd	1,545	.....	69	.....	.....	.....	.....
Average amount of gain for one herd	1,641	.....	60	.....	.....	.....	.....

There were 72 unprofitable cows sold during first year before their year's work was completed; their records do not appear on our report, to lower the average of first year's work.

WEST SALEM COW TESTING ASSOCIATION.

Began test February 1st 1909, and ended February 1st, 1912.

Summary giving average record of each herd.

	Milk, lbs.	Fat, per cent.	Fat, lbs.	Gross returns.	Cost of feed.	Profit.	Returns for $1 in feed.
First year's average of all herds	5,232	4.3	228	$66 40	$30 50	$35 90	$2 17
Second year's average of all herds	5,085	4.6	233	70 60	30 77	39 92	2 29
Third year's average of all herds	5,935	4.5	269	84 00	33 50	50 50	2 50
Gain	703	.....	41	.....	.....	.....	.....
First year's average of one herd	5,287	4.8	253	77 76	40 28	37 48	1 93
Second year's average of one herd	6,172	4.6	286	89 97	36 98	52 99	2 43
Third year's average of one herd	6,381	4.6	297	82 18	38 38	43 80	2 14
Gain	1,094	.....	44	.....	.....	.....	.....
First year's average of one herd	3,547	4.3	152	40 71	26 98	13 73	1 50
Second year's average of same herd	4,539	4.3	195	58 40	29 60	28 80	1 97
Third year's average of same herd	6,165	4 3	265	82 61	35 85	46 76	2 30
Gain	2,618	.....	113	.....	.....	.....	.....
Average amount of gain for all herds	703	.....	41	.....	.....	.....	.....
Average amount of gain for one herd	1,094	.....	44	.....	.....	.....	.....
Average amount of gain for one herd	2,618	.....	113	.....	.....	.....	.....

A letter received from Mr. L. P. Martiny of Chippewa Falls in reply to my inquiry, reads as follows.

Chippewa Falls, Wis., December 3, 1912.

H. C. Searles,

Fond du Lac, Wis.

Dear Mr. Searles:

Your letter received, and in reply will say that after being a member of a cow testing association for over three years, I believe the cow testing association is the one practical way of determining—first, the productiveness of cows; second, teaching one how to care for, and feed cows; third, the value of dairy blood, and fourth, the great difference there is in cows.

There has been no single factor that has developed the dairy industry in this locality like the cow testing association.

The cow testing association has a good effect socially on a locality, for through their common interests, they are drawn together in farmers' clubs, neighborhood meetings, etc. Members of a cow testing association are always ready to discuss points of feeding, breeds of dairy cattle and anything pertaining to the dairy business. Without an association, eacn man is individualized and besides he does not even have enough knowledge of the productiveness of his own cows, the cost of their feed, etc., to talk intelligently about them.

I would say that in our cow testing association the man who is conducting the association is the best monthly newspaper one can get. Not that he goes gossiping about other peoples affairs or business all over his route, but we hear what other herds are producing, how they are being fed, managed, etc., and we have a chance to compare our herd and methods of feeding with other men.

Our cow testing association has been the means of bringing into this locality at least a dozen pure-bred dairy bulls to take the place of scrub or beef bulls, and interest along this line has just nicely started to develop.

Our cow testing association has built more silos, ventilated more barns, put in more cement floors with improved cow fastenings, purchased more carloads of high protein feeds than would have been done in years without it.

Before a man has his cows tested for dairy production, he is usually willing to let a buyer go into his herd and pick cows

with a range in price from $40. to $50. if they are fairly good and uniform herd. After he has been in a cow testing Association he will usually price them to buyers quite differently, the price ranging from beef price for some that are simply boarders, up to $60, $75, $100, $125, and even higher for individuals that have returned him profits far above what he ever dreamed of. In other words, a man never knows his cows, or how to take care and feed them, until he keeps records of their production.

I believe the association is the most practical, cheapest and most efficient way of keeping these records, as the whole community has the same plan, is working for the same end and is in the same game. I remain,

Yours very truly,

L. P. Martiny.

The opinions of such men as Mr. L. P. Martiny, J. H. Kelly and W. H. Clark should carry great weight in the progress of testing associations in Wisconsin.

DISCUSSION.

The Chairman: We who have had experience with cow-testing associations believe in them. I belong to one of these associations. Right on my farm I have a creamery, a butter maker and all the facilities for testing milk; have had them for two years, and yet I am going to make a confession, and I believe there are a lot of other farmers just like me.

Most farmers are lazy when it comes to making figures; they work all right, but when it comes to using the pencil they are lazy. The trouble is we are busy people. For instance, at haying time we work hard all day. We want to get the chores done in a hurry and we don't like to take the extra time to test the milk. We pass it by once and then we can't seem to catch up. It is not because we object to the extra expense, but as it is nobody's particular business, it does not get done at all.

But here we pay a dollar to have our cows tested for the year. We know it will be done, and that we will find out exactly what each cow produced for that year, what she has eaten, what it has cost,—it is all figured out for us. It is done

by a man that is paid to do it. It is his business to do it and he comes to the farm periodically to do it, and so the work goes on whether we are busy or not. We find we never spend a dollar that gives us any better interest than the dollar we pay to find out whether a certain cow is boarding with us or helping us to pay our board. Isn't it worth a dollar to find out whether a cow is running us in debt? I believe this is the most economical way we can gain this knowledge.

It is well if you do this work yourself; there is no criticism on your doing it if you will do it and keep it up, but we believe this is a very practical way of making sure it is actually done.

Secretary Glover: Notwithstanding all the benefits that come from the cow testing associations, few realize the difficulties under which they are organized and operated. A few years ago, we were trying to reorganize a cow testing association that had been in operation for two years. We got together what we thought were the leading men of the association and after discussing the value of these associations one man said, "I found out that my whole herd is not doing what it ought to do." He also said it was the most profitable thing he ever joined, yet when the paper was passed around for him to sign for another year he refused. Now, you can imagine the influence that man's actions had upon all the rest who had not had the opportunity of trying out the cow testing association. The point that man made for refusing to sign for another year was that he expected to dispose of all his cows on account of the record they had made, and put in a new herd, therefore it would not pay him to continue the work with his present animals.

I want to mention a few things that come before us in operating a cow testing association. One man approached me and said, "Glover, I can tell how much milk a cow gives when I milk her twice a day. I can see how much there is in the pail and I can estimate close enough for me as to the quality, therefore it would be unwise, unprofitable, and foolish to expend a dollar per cow per year for that purpose." I said to him "My friend, I don't believe that you can tell within five thousand pounds of how much milk a cow gives in a year." Perhaps an extravagant statement on my part, but I want to tell you why

I made that statement. Something like ten or twelve years ago I tested cows in Illinois. I was probably the first man in the United States that traveled from farm to farm with a tester under one arm and a pair of scales under the other to determine what every cow in a farmer's herd was doing.

Very often I used to put this question to the man whose farm I visited. "I want you to pick out of this herd before I begin the year's work the cows you think are the best and the ones you think are the poorest." And do you know that half of the time the ones they picked out for the best, would be at the tail end of the herd and what they considered their poorest cows would be at the top. There is one point very few farmers take into consideration in judging the value of a dairy cow, that is, her persistency. Many cows come in and give a large flow of milk for two, three, or perhaps four months, and the impression that that cow's production makes upon that man's mind when she is fresh is very vivid and you cannot change it afterwards, no matter what happens. The man's opinion regarding that cow is fixed, and nine times out of ten she turns out to be an unprofitable animal. Here comes another style of cow that may never give over twenty to twenty-five pounds of milk daily, but she persists in doing that for nine or even ten months in the year, and the result is she produces a good record. Her small yield and persistent flow of milk has made no impression on that man's mind and he takes no interest in her. The continued use of the scales and the Babcock test will tell accurately what such a cow is doing. There is another statement we often hear made by farmers. They will say "I can tell by the looks of a cow's milk how much it will test, and therefore why bother with the Babcock test." Just let me tell you, color is no indication of the quality of milk. Guernsey skim milk is a deeper shade of yellow than Holstein whole milk. If you were to select it by color you would select Guernsey skim milk in preference to Holstein whole milk, and would not you be making a mistake? When a man makes a statement to me that he can tell the richness of milk by its color, I feel like saying to him, "My friend, do you know that the buffalo produces the bluest milk on earth and that it tests more than any breed we have?" Buffalo milk is blue, speaking from the

standpoint of color comparisons of milk, and yet it tests between seven and eight per cent.

I can excuse men for refusing to look into this testing business whose judgment is distorted by a cow giving a large flow of milk in the beginning but not persisting in that flow, and I can forgive the man who wants to judge quality of milk by its color, but there is one class of men I cannot forgive and that is those who are breeding pure breds and do not want to know how much their cows are producing. Do you know that we have started in the testing of pure bred animals and have had the owners of those herds quit because the records of those animals for production were such that they would have to discontinue making sales to an unsuspecting public. We have had men who tried to substitute cows for their own cows in order to be able to show a high record, and could sell a bull calf from an animal at an advanced price, with the Dairymen's Association records back of them.

Now, this brings me to the point I want to make to you men who are thinking of going into the dairy business, and who, I hope are thinking of buying pure bred sires, at least, to head their herds. Because an animal has a pedigree is not necessarily any proof that he is any better than a scrub, and when a man refuses to have his herd tested because he cannot make good sales, if the real conditions are known, we are suspicious of that man.

We ought to protect buyers against subterfuge; we ought to have all animals sketched, and also have some means of identifying men who quit the association because their records of pure breds are not any better than common scrubs. In that case they could sell bulls for $150.00 when the record of the mother did not show but 150 or 175 pounds of fat. I have no patience with those men. They are not only trying to deceive themselves, but are trying to deceive the people of this country, and they are a hindrance to the advancement of the dairy industry.

Now, the Dairymen's Association has been unearthing these things and showing them up for what they are so that dairy people who are following the business as a vocation will not be misled. There are plenty of honest people making honest records with herds, and I am offering this statement so that

when you come to the purchase of a pure bred sire you will hunt out those men who have had interest enough in breeding, who have integrity enough in dealing with their fellow-men, to give you the records of the mothers of the animals you are purchasing. It seems too bad that we must deal with dishonesty in our work; it has been a source of annoyance and it has been a menace to progress, and we hope that the time will come when no breeder will be able to sell a sire from his herd unless that sire has within his blood, records of animals capable of doing efficient work. It does not make very much difference, friends, the number of schools a man has graduated from. The test is what he can do when he gets out into the world, that is the thing that counts, and it does not make much difference how long an animal's pedigree is if he cannot transmit the ability to convert the feeds of your farm into profitable dairy products.

That is what we keep dairy cows for. We educate men to be more efficient; not to be loafers. We breed cattle in pure bred lines to be more efficient, and not beggar scrubs. Let us seek then, the animals that have ability to do things, and let us insist that the breeders furnish such animals to us.

Mr. Scribner:—He has pretty nearly said it all, still there is a little more to say. It has been my privilege for the last two or three years to carry on what we call a demonstration at the National and International Dairy Shows. We have kept records and tests of certain dairy cows so that people could see just what they were doing. At the last International Show at Milwaukee, I had ten cows brought in. We weighed and tested the milk from each cow and we weighed the feed each cow ate every day. In that way we got an exact record of what each cow should be credited and charged with.

I imagine there is nobody here keeping cows for fun. If that is what you are after you can get more fun out of keeping a goat or a buffalo, and do it with less trouble and expense. I guess all of us are keeping cows for the money we can get out of them. The trouble is, we farmers have neglected the business side of farming, have neglected to use a lead pencil and that part of our heads above our ears. How can we tell how much we should get for a pound of butter

in order to make a profit on it if we don't know how much it cost to produce that article? I go to a store and I ask the merchant the price of a certain commodity. He says so much. I say "How can you afford to sell it for that price? "Why, I know just what it cost me to a penny." I wonder how many men in this room can tell how much it costs to make a pound of butter on their farms. At Milwaukee we had a cow that, do the best we knew how with her, couldn't pay for the feed we gave her within five cents a day. Suppose you had a lot like that in your herd, could you buy your children Christmas presents? Then right in the same bunch was cow No. 5. She made us clear money every day. For every dollar's worth of feed we gave her she returned us $2.45. The other cow I spoke of returned us .78 cts. for every dollars worth of feed we put in her, and couldn't do any better; it was not in her to do better. Which of these cows would you rather own? You would not know which until you had tested them both, would you? Now, these cow testing associations employ experts who bring these things before the farmer every month in the year, and at the end of the year you can see exactly what every cow has done. These continued tests show us one very important thing, and that is, it is not so much the amount of money we earn through our cows in the year, as it is the amount we save after paying expenses. If your old cow makes a thousand pounds of butter in a year and it costs as much as you get for the thousand pounds to produce it, you will not have much left; we have to take into consideration the question of economical feeding, and these experts sent out by the testing associations will help you a lot. So let's do more thinking; let's get rid of our unprofitable cows; let's get our dairy farming on a good, substantial foundation, and we will not only make more money but we will take much more interest in our dairy work.

A Member: I know there are farmers here who are thinking of going into the dairy business. They have the farms, they have or can easily get the feed, but they have no cows. Tell us the best way to proceed.

Mr. Goodrich: You want to know how to get into the dairy business? All right. I guess I can answer that question. Buy a cow.

The Chairman: I see Mr. Goodrich differs from another eminent authority in this association. He said "Buy a bull."

Mr. Goodrich: The best way is to start in and buy such cows as you can find, choosing them with your best judgment or asking somebody else with more experience to judge for you, and then gradually build up and improve your herd. I believe the best way to answer that question is to give you a little of my experience. I commenced in the dairy business a great many years ago, in fact perhaps my father was the first dairyman in southern Wisconsin that made a real business of dairying, and he commenced in 1847. After I got well into the dairy business, of course I tried to study my cows and I felt pretty sure some cows were doing better than others, but I had not the means of making sure about them. There was no Babcock test invented until long after, and we had no testing associations, so I did the best I could by setting aside the milk of each cow for a day or so to find out. It is easy enough to weigh milk, and I had been weighing every milking for many years. So in that way I got at some things I wanted to know in a crude way. After the Babcock test came out, I got one right away and for fifteen years I weighed the milk of every cow every day so I knew exactly how much she produced in a year, and every two weeks I tested it by taking a sample from four consecutive milkings. I had to do it myself because there were no cow testing associations. Any farmer can do it and if he has the proper implements and the proper ability to stick to it right through the year, he can do it as well and as cheaply as he could get it done in the cow testing association, but that last "if" is a big one.

I want to tell you some of the things testing did for me in fifteen years. I more than doubled the production of my herd, and I want to tell you one or two instances.

I had a big cow that we called Old Whitey, she had considerable short horn blood in her but she was an immense milker. I had a hired man that took a good deal of interest in the cows and when Old Whitey came in he would say to me, "Now if you only had a lot more like Old Whitey you could make a lot of money in the dairy business." He always milked her and liked to get a big pail full. I milked a cow that stood right beside her that we called Beauty. Old Whitey

used to give from fifty to sixty pounds of milk a day when she was at her best. Beauty never gave over 25 pounds but she never got below twenty pounds until six weeks before she was fresh.

After I got the Babcock tester, I tested the milk of Whitey and found that with all her great production for a time, she only gave about 6,000 pounds in the whole year, and the average test for the year was three per cent. That made 180 pounds of butter fat, and she was a big cow to feed. I did not keep an exact account of the feed but I know she ate considerable more than the others. Beauty gave a thousand pounds of milk less, 5,000 pounds, but the average test was six per cent during the year, which made 300 pounds of butter fat, nearly double what the other cow gave.

Mr. Gibbs: I would like to get Mr. Scribner's ideas about dehorning cattle.

Mr. Scribner: I think it is all right to dehorn cattle in the average dairyman's herd; they are handled a little bit better. The time to dehorn is in cool weather. I think the safer time is late fall or early winter season. I never dehorn my cattle because I rather like the looks of the horns. I sometimes think that if a man's cows gore each other and fight, it is because they are poorly taken care of, that if a man took care of them as he ought to they would not fight like steers.

A Member: The question I, as well as a good many others, came here to find out is this: The farmers in this country are slowly clearing their farms and they want to know the practical way to do things. You might buy a cow that cost $150 or $200 and stop with one cow, a good one. It would take a long time to build up a herd that way. Another way is to go to the stockyards in St. Paul and pick out several heifers and buy them for the same amount of money. You could pick them out, make a selection that might possibly do something in the way of a starter for a dairy herd. I want to know from you men of experience which would be the practical way. If you had a farm on which you could take care of fifty cows at once, would it be proper to go to St. Paul and buy heifers for a very small amount of money and then develop them, weeding out those that proved worthless

and keeping those that proved to be good, and get a pure-bred sire and build up a dairy in that way? I want to find out if that is a good plan to work on.

The Chairman: I am going to take the liberty to answer that question myself. From my experience, and judging from some things I have seen others do,—I would rather take my chances with the heifers. When you come to buy a bunch of heifers from me, we are pretty near on a level, because I can't tell any better than you can which are going to be the best cows. I would say to you people first make up your mind what breed of dairy cattle you want to develop, then try to buy some grade heifers of that breed and buy a good sire to put with them. Then as they come along develop them, eliminate the poorer producers, and in a little while—it won't be but a short time—you will have a herd of cows that will be to all intents and purposes, the equal of a pure-bred herd.

Mr. Hill: I want to add a word of caution. One of the troubles in buying at the stockyards is that that is the dumping ground for tubercular animals. You certainly do not want to buy at the stockyards or anywhere else without their being tested. If there is an opportunity to buy heifers cheap that way, I would not hesitate to do it, but you will find a lot you don't want if they are tested, and you can't afford to buy them without test. Even if they are tested at the place you buy them I would not rely on that, I would have them tested again after getting them home.

Secy. Glover: I fully agree that it is a good thing to buy heifers, and I also believe they should be tuberculin tested, but I want to bring home one point that is too often missed. There is a statement that is very common among breeders that a dairy sire is half the herd. If he has good breeding and your heifers common breeding he is more than half the herd. Buy moderately good heifers and breed them to the best dairy sire of the breed to which they belong. The first generation those heifers have half the blood of the sire. There is no reason why a good sire, well cared for, should not bring you annually twenty to twenty-five good heifers. Just think what a long step you have already taken in getting half the blood of the sire in the first cross. Then I would go

again and buy another good sire with the idea it is not going to make very much difference whether you pay two, or three, or five hundred dollars for that sire, because what does it amount to?

Think what the interest would be on a sire that cost you $500 if he increased the value of each heifer but $5.00. Breed the second sire upon these half-bloods, and what follows? You have three-quarters of the best blood in the veins of the breed that you have chosen. Cross again and you have got 87 1-2 per cent. See how quickly you can bring up your herd with the right kind of a sire. But the sire must prove himself a getter, a good stock, just as much as the dairy cow must prove herself a capable animal at the pail. When you purchase a bull you are taking a certain chance, even if he has within his veins the blood of the best of the breed.

Mr. Hill owns five or six bulls at the present time that he is lending his neighbors as a test upon their grade cows. He goes to the farms and looks over the progeny of the different sires before he selects one of them to head his herd.

VALUE OF SILAGE AND ROOTS.

L. P. Martiny, Chippewa Falls, Wis.

In treating this subject, what I shall have to say will be more applicable to the northern half of the state and the conditions as we find them.

I do not wish to quote a lot of statistics or analyses to prove my points, for I do not think the chemist has ever given us the value of a succulent feed as compared with dry feed. The old cow herself is the best guide we have to go by in determining the value of roots or silage.

The real intrinsic feeding value of corn silage depends on the maturity of the corn put into the silo, the efficiency of the silo itself and the variety of the corn.

I will take it for granted that the silo is a good one, with straight, smooth perpendicular walls that are perfectly rigid and perfectly air tight. The next thing will be the selection

of the variety of corn. Right here is where many dairymen make a mistake. In some way they labor under the delusion that when they put up a silo, they must at the same time get a new variety of corn, and usually their idea is to get corn that will make a bigger growth than the variety they are in the habit of growing which is a serious mistake right at the outset because it means a sour and watery silage that has a tendency to produce indigestion. Select the variety of corn that has given best results for you before you had a silo.

If you do not already have a variety that is suitable to your locality and is sure to ripen, I would recommend the flint corn or some of the very earliest types of dent, such as Wisconsin No. 8, or Minnesota No. 13, which are supposed to be the same thing.

If land is comparatively free from weeds, one will get a little larger yield by planting in drills; on the other hand, if weeds and grasses are going to bother, it had better be planted in checks so it can be cultivated both ways.

The next consideration will be the time to put it in the silo. Here again the beginner usually makes a mistake by putting the corn into the silo too green. He intuitively thinks that if green undried corn makes silage, the greener the corn the better. To make the best silage, corn should be fully matured, corn well dented and some leaves beginning to dry up at the bottom of the stalks. Silage made from well matured corn will not be so sour, will be drier, can be fed in larger quantities, and will give better results. Don't be afraid to let your corn mature in the northern half of the state, as there will be no danger of its not having enough moisture to make good silage.

In regard to growing roots, would say that it is much easier and simpler than most people are aware and the yields in the northern half of the state are enormous, ranging from ten to fifty tons per acre, depending on the stand, fertility of land, etc. For roots to grow, I would recommend first, the rutabaga; second, the different varieties of beets; and third, carrots.

Perhaps the simplest way to grow rutabagas is to sow one-fourth to one-half pound of seed per acre on new breaking, from the middle of June to the first of July, at the same time

the breaking is being done. In a good year this will give a good crop without any cultivation or attention whatever.

Another way that involves more work, but gives larger returns, is to prepare a piece of old ground, having it very fertile. Keep the land well disked up to the last of May to the 20th of June when the soil should be "fine as a garden". Sow the seed with a hand garden seeder in rows about two to two and one-half feet apart. After the plants come up, start cultivation. When the plants are two to four inches high, thin them to at least one foot apart in the row. Keep the cultivator going until the tops prevent further cultivation.

In case one has land that is wet, or there is some other reason that it cannot be worked, rutabagas or beets may be planted in rows in the garden and later transplanted, just like cabbage, pinching off some of the outside leaves at the time of transplanting. This method insures a perfect stand, less labor, hoeing and cultivating, but requires the extra labor of transplanting.

Now as to the feeding value of silage and roots, will say they compare very favorably with good pasture grass.

We all know how stock that has been wintered on dry feed begins to thrive; cows increase their milk flow and shed their hair and take on new life and vigor when turned out to grass. The chemist would tell us there is not as much feeding value in grass as there is in hay but the old cow gives more milk on the grass, and as dollars and cents are what we are after, we will go by the cow. When a dairyman provides silage or roots for his stock during the long winter months, he is giving them pasture conditions so far as feed is concerned.

Stock of all kinds not only relishes silage and roots, but it will eat more other feed, will have a slick, short coat of hair and a nice loose skin all through the winter, providing it is properly housed in a good, clean, well lighted and well ventilated barn.

For the new settler starting in to open up a farm I would say, grow some roots to feed the first cow you have. Depend on roots instead of silage until you get five or six milch cows and some young stock. Then if you are financially able and can hire a cutting outfit quite conveniently you are ready for a silo.

Right here some will want to defer building the silo until after they build that big barn they are dreaming of some time in the future. Don't let that excuse defer the silo. Your first silo may be quite crude. Haul pine or hemlock logs and have them sawed into 2x6's. Have your blacksmith make some hoops and then for a very small outlay of labor and money, one can have a silo that will give very good service for a few years and will pay for itself many times over.

The silo is not such an expensive, mysterious, complicated monster, whose building and using is to be dreaded, as some people think it is.

Make up your mind to build a silo if you need one. Build it and when you see the results you get, you will be surprised how easily and cheaply it all came about.

Afternoon Session, Dec. 11, 1912.

President Jacobs in the Chair.

Secy. Glover: I want to say in addition to what Mr. Martiny has said that the best dairy farmers of the country have learned that the more nearly the dairy cow can be supplied with feed such as she gets from June pasture the better are the results. The cow's digestive organs are such that she requires a large amount of bulky feed. In that respect she differs from the horse and the hog, both of which have small stomachs in comparison with the paunch of the cow. There is something about the succulent feeds as Mr. Martiny says, which seems to make it possible for the dairy cow to consume a larger amount of fodder corn, for instance, in the form of ensilage, so as to give a better result for all she consumes.

Mr. Gibbs: How much should a cow produce and what should the milk test before she should be discarded as not being on a paying basis?

Mr. Glover: That question cannot be answered definitely because sometimes a man may be so situated that though he knows his results are poor, yet he must get along until he can do better. It is pretty well established that at the present price of feed and butter fat, a cow must produce about 150 pounds of butter fat in order to pay for the feed she eats.

The Chairman: Let us not get away from the silo question.

A Member: How many cows should a man have before he can afford to build a silo?

Secretary Glover: I say twelve to fifteen; some say six to ten.

The Chairman: I should say if you have ten cows and are working into the dairy business build a silo and you will soon have fifteen cows. I notice this paper says, if you are financially able build a silo. That does not strike me as right because I had to do it before I was financially able, or I never would have built one. I built one without being financially able, and on account of building it I now have two. I do not know of anything I would feel more like putting a mortgage on my farm for, than to raise the money to build a silo.

Mr. Gibbs: We could not expect people to patronize a store until there is a store to patronize, and we could not expect the cows to patronize a silo until there is a silo. I believe in building the silo first; then we will get the cows later to patronize the silo. That is right, isn't it?

Secretary Glover: To a certain extent. You would not build the store until there were people to purchase goods.

Mr. Gibbs: You will get the patrons if you build the store.

A Member: I am feeding seven cows from a small silo.

Secretary Glover: I am very much in favor of the silo, but in my experience I have seen some bad mistakes made in building silos, and such mistakes always create a prejudice against them. I know of communities to-day where you can't get them to build silos because somebody made a mistake.

The Chairman: There is one thing we are losing sight of. There are some principles involved in the building of silos and feeding out of them not involved in the building of barns and granaries. In building a silo build it in height according to the time you are going to feed the silage, and in diameter according to the size of the herd to be fed. Whether you are going to feed three cows or thirty you want it about thirty to thirty-five feet deep, because any number will feed for the same length of time. Now, a silo that is thirty feet deep and only broad enough to feed three cows a day, taking off enough so the rest of it will not spoil, is not of proper proportions. If you are going to have a silo at all you want it during the feeding season. After you have it a year or two, you will want to have that feeding season last the entire twelve months, as most of us have, and we have found it necessary to build another silo.

Mr. Gibbs: Where a silo is sixteen feet across and thirty feet high, how much is it necessary to feed off a day in order that we may maintain the real value of what is left in the silo?

The Chairman: It does not make any difference how wide it is. You have to feed from an inch to two inches a day. One inch a day in a winter like this would be enough, about 2½ inches in the summer time.

A Member: It has been suggested that the machinery necessary to fill a silo costs in the neighborhood of $500. Of course that is a great expense and would be as great for a small silo as for a large one. Our way of getting around that is, that the machinery is bought coöperatively, and rented to each man for six dollars a day. A man goes along and tends the engine. That makes it reasonable for each man.

Mr. Gibbs: That is one of the questions bothering the farmers in our neighborhood. Can we better ourselves by coöperating or can we go about this thing individually and thereby get along just as well?

Mr. Glover: You can do better by coöperation, of course.

THE IMPORTANCE OF A PURE BRED SIRE.

C. L. Hill, Rosendale.

While the average production of the cows in our Wisconsin herds is increasing each year, there is still such a wide margin between this average and the results obtained in herds that are bred and fed right, that there will be chance for improvement in most of our herds for an indefinite period. I say herds that are bred and fed right, for while you will find some cows of nondescript breeding that are doing well at the pail, you will find that all of the herds in the vanguard are the result of careful breeding along strictly dairy lines. Along dairy lines, because the question of dual-purpose vs. strictly dairy breeding is now so well settled that it does not need our attention, more than to remark in passing that the effort now being put forth to turn some of the so-called dual-purpose breeds into special dairy breeds is not deserving the attention it is re

ceiving in some agricultural papers. Why any man should in this day wish to start on a line of breeding 50 or 100 years behind another man is hard to comprehend.

The term pure bred is now generally used to mean an animal recorded in any recognized herd book. I take a pure bred dairy sire to mean one of the four great dairy breeds, for they so far excel any others in dairy production that they are the only breeds we need to consider in this talk.

The question of breed is very important and needs our careful attention. The men having in hand the breeding and development of the different breeds once seemed to think they could best accomplish their purpose by defaming the other breeds, but we are now glad to see that most of the leading breeders and dairymen concede that there is great merit in all of the dairy breeds, and that our battle should not be against one another, but against the scrub cow.

While personally I am a friend of the Guernsey, you will find my neighbor Scribner equally as partial to the Jersey, and neighbor Gillett to the Holstein, and they are both better dairymen than I am. Study your conditions carefully and see herds of all breeds before you decide which breed you will keep, and have, or think you have, a reason for deciding as you do, but having decided stick to that line of breeding regardless of the blandishments of the men who are partial to one of the breeds you did not accept.

In selecting your bull, after the breed is decided on, remember the common saying, "The bull is half the herd", does not at all express the whole truth, as it would be nearer the truth to say he is three-fourths or seven-eighths of the herd. Five to ten years from now, from half to all of your herd will be daughters of the bull you are to buy now, and the matter of $50 or $100 should not stand in your way at all if you are sure one bull is better than another. But there is the sticking point. I am sorry to say it is very unusual that one can be sure any particular bull will excel another as a sire, for while it stands to reason and usually proves true, that the bull with the best line of maternal ancestors will prove to be the best sire, it is never-the-less true that often a bull that is bred right and a fine individual will prove a total failure as a sire. I once used such a bull in my herd that never sired a daughter as good as her dam, while on the other hand another bull

I used never sired a cow but that was better than her dam. This matter of the selection of a bull is to my mind the greatest problem that faces us as dairymen to-day. The only safe way for any breeder or dairyman to do, is to hunt around and find a bull that has proved to be a good sire in some neighbors herd, and then buy him regardless of price.

Only the other day a friend of mine visited a grade herd, and wrote me about a line of cows he saw all sired by one bull, and the bull still on the farm. Look up that sort of bull, eliminate the uncertainties of the game, and start now where the other man left off, but way in advance of him, for perhaps he, in finding this bull, tried two or three others that did not raise the production of his herd at all.

One of the best dairymen in Wisconsin testifies that a certain bull used in his herd damaged it more than any other two bulls did it good. Therefore I repeat, buy a tried sire. There is a great and, I think, unfounded prejudice against old bulls. Most dairymen seem to think a bull has outlived his usefulness when he is three or four years old. I have kept a bull until he was 15 years old, and it is said that the Jersey bull Mercury was struck by lightning when he was 21 years old.

Probably a large part of this prejudice comes because most men seem to be afraid of a bull, and rather handle a yearling than an older bull. Do not forget it is the kind bull, that is trusted because it is kind, that kills men, and if you will only learn to trust a kind bull as you would a lion then you will not give even the vicious bull a chance to get at you.

A few years ago my neighbor, Mr. Welles, bought a bull that had just killed a man; he was nervous and excited, and was indeed a dangerous animal. He was at once put to work in a tread power, and now after four or five years more of life is kind and easily handled but nevertheless always watched. He is proving a wonderful sire and it would have been a crime to have slaughtered him just because a man knew no better than to go in a stone fenced barnyard with a strange bull.

The first Guernsey bull I ever owned was one of the very quiet sort, and he taught me a lesson when he was about two years old. He caught and pinched me till I could scarcely take a long breath for two weeks, and it was a miracle I escaped so easily. I sold this bull to a man who said he was

not afraid of a cross bull. He worked him in a tread power and used him for years.

If you must buy a young bull, be sure, no matter what breed he is, that he is backed up with a long line of cows that have produced good official yearly fat records. You can find plenty of this sort of bulls in any of the breeds.

No matter what the age of the bull you buy, keep him, if possible, in sight of the herd of cows, and do not imprison him in some dark, damp, dirty stall where every association will help to make him vicious. If you have no tread power, fix a yard in which he can exercise, hang a stump or block about two feet from the ground in his yard and he will take exercise enough to keep him quiet.

Do not commence to use the bull too young. Many persons write to me asking for a bull to serve 20 to 50 cows, and say that one 12 to 14 months old will suit them. A bull should be two years old before he has heavy service, and more than 14 months old before he is used at all.

The Wisconsin Dairy Cow Competition carried on by the Wisconsin College of Agriculture in 1909, 1910, and 1911, brought out some records of grade cows that may well be studied with care and profit, and should prove to the most skeptical the benefits to be derived from the use of the pure bred sire.

The 11053 Grade Guernsey cow, Jerry, made the following semi-official record in the Wisconsin Dairy Cow Competition, was 10 years old at the time of the test and was sired by King of Ellington 11096. She was only a half blood Guernsey.

Month.	Lbs. milk.	Per cent fat.	Lbs. fat.
1910			
May	1,005.8	4 94	49 68
June	1,695.0	3 74	63 39
July	1,755.3	3 95	65 38
August	1,603 0	4 39	70.37
September	1,465.9	4 45	65 23
October	1,429.3	4 29	61.31
November	1,233 9	5 34	65 89
December	1,173.4	5.40	63.36
1911			
January	945 1	5 73	54 15
February	663.4	5 82	38 61
March	926.6	5.00	46 30
April	1,462 0	4 65	67 98
May	485 3	3.74	18.17
Totals	15,744.0	4.63	729.87

This is the largest record ever made by a grade cow of any breed, and I think the largest record made by any cow, pure bred or grade, that calved again during the year of her test.

Her feed for the year consisted of 1911 lbs. of Ajax flakes, 639 lbs. wheat bran, 80 lbs. gluten feed, 243 lbs. ground oats, 682 lbs. corn meal, 960 lbs. soiling crops, 8332 lbs. corn silage, 1374 lbs. alfalfa hay, 164 lbs. oil meal, 704 lbs. ground barley, 604 lbs. mixed hay, 1191 lbs. unicorn dairy ration, 750 lbs. beets, 20 lbs. peas, 53 lbs. corn stover.

Value of butter fat	$229.55
Cost of feed	99.20
Profit	$130.35

Record made by A. N. Schmit, Appleton, Wisconsin. Owner Charles L. Hill, Rosendale, Wis.

The Holstein grade cow, Madge, produced 20,541 lbs. milk and 644.4 lbs. fat, at a profit of $97.48.

The Jersey grade, Lily, gave 9,889 lbs. milk and 554 lbs. fat at a profit of $96.47, while other grade Guernsey cows gave profits of $128.79, $101.35, and $100.08.

The average net profits of the 5 Holstein grades in that competition were $81.14, of the 24 grade Guernseys $78.00, and of the 21 grade Jerseys, $50.62. These figures were not obtained by valuing the product for any more than any of you farmers obtain for it at your local creameries.

Compare these results with the cow that produces 150 lbs. of fat in a year, that just pays for her feed, and the owner cares for, as a pastime.

Another reason that should appeal to every farmer in Wisconsin in favor of using a pure bred dairy bull at this time, is the price commanded by good grade cows. Buyers are scouring the state looking for good grade cows and as high as $150 and $160 each have been paid for car loads of the best grades.

I met a breeder from the south in New York recently and he said if he could find a carload of grades such as he wanted he would pay $200 to $300 each for them if necessary.

One breeder in Iowa sold six grade cows, the pick of his herd, for $200 each, and the next twelve at $150 each.

Just let it be known that any community can supply a carload at $100 each, and buyers will be there within a week. A man came to Rosendale only last week and offered as high as $125 for cows but went away without any.

Why the farmers of Wisconsin are content to use a scrub bull in the light of such facts, is beyond comprehension, but I am sure the farmers of Ashland county will not be willing to do it.

(Continuing.) I had a letter from former Governor Hoard lately, in which he said that in spite of all the preaching in this convention and in Hoard's Dairyman, and every other influence that had been at work all these years, that the increase of the use of the pure bred bull had been very slight in this state, but that the present price of grade cows was having more influence on those farmers who were buying pure bred cows than anything that had ever been done. You can't afford to do anything else than to buy a bull and a good one.

Mr. Gibbs: By special request of some of the people in my vicinity I submit this question once more; they want to know just how much a cow is required to produce before she is discarded, whether she be a grade cow or a pure bred.

Mr. Hill: Don't you see so many other things enter into that question that it could not be answered directly, in one word as you are asking for. A farmer must know the conditions of his particular cows; the price of feed on his farm, what he does with his products. If he knows all those things the question might be answered.

There are any number of herds in which cows would not be kept—the owners could not afford to keep them if they did not make two hundred,—sometimes even three hundred pounds of butter fat in a year. Sometimes a cow will pay for her feed if she produces 150 pounds. In some instances a man might not be able to get enough for the butter fat so that he could afford to keep her even at 150 pounds. Then, another thing, suppose I answered your question and told you that you could afford to keep a cow for 150 pounds of butter fat. Can you afford to keep her when you can get another cow to take her place that can make 200 pounds? The question must be qualified every time you try to answer it.

The Chairman: I made some investigations last winter in regard to the number of pure bred individuals of the different dairy breeds in the state, and drawing an average of their production of calves, I found that to supply each herd of cows in Wisconsin with a pure bred bull, it would take thirty years.

Mr. Hill: Less than two per cent of the farmers of Wisconsin have a pure bred bull at the head of their herds.

Mr. Everett: This question stirs me up. It is a very important one to you farmers of Ashland county, more important than you know because you have not had experience as practical dairymen, such as some of the rest of us have had in years gone by, and some are having to-day. You have not had the experience which will teach you, impress upon you the value of the pure bred sire. In northern Wisconsin, the farmers as a rule are not wealthy. Many of them are fairly well to do, but a great many of them, hundreds and thousands, are struggling to pay for the home, to pay for a little land. They have the meagre equipment, and not an over supply of funds. Now, pure bred sires, while they are almost an absolute necessity, cost a good deal of money. That you have learned in this convention. I often advise northern Wisconsin farmers to coöperate in many ways and one of them is in the purchase of a pure bred sire. Two or three neighbors can buy a good, pure bred dairy bull from a reliable breeder—and we have them plenty,—at a fair, reasonable price. They will get value received for their money and they can use him a certain length of time and then dispose of him. In that way a pure bred sire can be introduced into this north land much faster than if each one waits until he feels he can pay from one to two hundred dollars for such an animal. You can easily get as much or more for him when you are through with him as you paid for him. That is often a practical solution of the problem.

Mr. Hill: Mr. Scribner has been interested in an association they call the Four Square Association in Minnesota. Four groups of farmers each buy a pure bred bull and when they want a new bull in a certain group, they exchange. They call it rotation in bulls, and it works well.

ANNOUNCEMENT OF RESULTS IN BOY'S AND MEN'S JUDGING CONTESTS.

F. H. SCRIBNER.

A boys' and men's judging contest was held wherein both the men and the boys had an opportunity to judge cattle. It was unfortunate that the kind of cows brought in for this judging contest could scarcely be considered good dairy animals.

Mr. F. H. Scribner lectured on the subject of judging dairy cattle before the contest started. After he had described what might be termed the "fundamental points" to be considered in selecting a dairy cow, those who desired to participate in the judging contest went to a nearby stable and passed upon several animals.

The object and purpose of such a test as this is to call the attention of those interested to the fundamental points to be considered and to teach them to see those points.

The following is a discussion which took place after the contest was over.

DISCUSSION.

A Member: Why do you suppose the boys beat the men?

Mr. Scribner: Because they know more; the result of good breeding, you know.

Mr. Hill: The boys of this country are having advantages their fathers did not have, and they ought to be thankful.

A Member: What about the question of inbreeding?

Mr. Hill: I never have practiced it in my pure bred cattle. I would rather trade bulls, but if I could not find one that I liked and the daughters were an improvement on their mothers,—good, strong vigorous cows,—I would not hesitate to breed them back to their sire. I would rather trade with my neighbor. Of course, a lot of developing of live stock has been done by inbreeding, but it requires the weeding out of lots and lots of animals.

Mr. Everett: For the benefit of the farmers here present I would like to say that if Mr. Hill, one of the best breeders of dairy cattle that we have in the country, says he cannot afford and does not dare to inbreed, don't you consider it for one moment.

A Member: I wish we could hear from Mr. Goodrich on that question.

Mr. Goodrich: I have not had much experience with this question being discussed. I have bred heifers back to their own sires, and it is a fact that the best cow I ever raised came that way. But I had some that were not so good as the mother and I feel a good deal as Mr. Hill does, that it is not a safe thing to do. You may blunder into something excellent, but the bigger part of the time you blunder into something pretty bad.

Mr. Gibbs: Is it advisable for people living in a new country where it is hard to get bedding to use sawdust rather than no bedding at all.

Mr. Glover: Yes, either sawdust or shavings.

Mr. Hill: Hard wood sawdust is a good deal the best, or better yet, basswood, not pine.

Adjourned to ten o'clock next day.

MORNING SESSION, December 12, 1912.

President Jacobs in the chair.

SILO CONSTRUCTION.

C. A. Ocock, Madison.

That a silo has come to stay in Wisconsin is a surety, and a matter which is of vital importance to the dairymen of this state. Frequently we get reports that Wisconsin is discontinuing the use of silos, but if such parties making these inquiries could step into our state for a few days, they would have an opportunity to change their minds concerning this matter. The silo has proved itself an important factor in the storage of feed; under some conditions it is equal to June grass. In some localities we find dairymen availing themselves of this opportunity and doing away with nearly all their pasture; reserving only a small area for exercising grounds for their herds. This feature of the silo is of great importance as it makes possible the operating of an extensive dairy on a very small farm. The feeding value of silage as compared with hay is a matter which many dairymen overlook, two to three tons of silage being equal to one ton of best hay, and occupies about one-third the space. Silage is worth about $4 per ton, while our best hay is worth from $12 to $20, depending upon the season of the year. A little mathematical calculation will soon show the advantage of having a silo. From ten to fifteen tons of silage can be raised upon one acre, while two tons of hay per acre is a good crop. Under these conditions it will be possible for a farmer to keep three times as many cows as when farming without a silo. In the past, many objections have arisen relative to the silo, and we find that many of them are entirely erroneous.

The principal objection at the present time seems to be the freezing of silage. The farmer will say that he would build a silo if he could build one which would be frost proof. Now

this is an absolute impossibility under ordinary conditions and economic construction for this section of the state. We find that the best method of preventing freezing is to build a silo as nearly air-tight as possible. The secret of the prevention of freezing is to prevent evaporation, as evaporation carries off heat and permits the entrance of cold to take its place. This rapid movement of the air currents caused by evaporation also generates a certain degree of cold which added to the cold zero weather outside of the silo causes rapid freezing in many instances. Frozen silage should not be fed to cows, but should be allowed to thaw, which can be brought about by throwing the frozen silage either on top of the warm silage or down at the foot of the chute. Silage should not be fed during milking time, but after the milk is carried from the barn; this will prevent any tainting of milk.

As to the kind of silo to build, is a very difficult question to answer as prices vary in different localities. We find the best silo to build is the one which is most suited to the locality in which the work is carried on, and also the one which mostly fits the pocketbook. Of course, the best silo in the end is the one which is the most permanent, and this naturally rests with the individual who is interested in the construction of silos.

In the matter of location for a silo, it is essential that it is placed where it will be best protected. If it can be placed on the south side of the barn, it will be found more satisfactory than on the north. In the northern part of the state, it is undoubtedly better to build silos inside the barn. There should be no objection to this, as a ton of silage occupies about one-third as much space as a ton of hay. Care should be taken in preparing the foundation to see that it is far enough below the frost line so that it will not be effected by freezing and thawing. Whatever superstructure is placed upon the wall, whether it be stave, brick, tile, or cement, it should be well selected and properly reinforced. From time to time, we hear many criticisms relative to different kinds of silos, but if the proper precautions are taken in constructing any silo, the silage will keep providing the silage is put up under proper conditions.

DISCUSSION.

A Member: In using the forms for the concrete silo, could you put in stone?

Mr. Ocock: You can put in stone up to a size that they will not project outside and come in contact with the form on each side. I should not use stone larger than my fist. If you do you can add it with your gravel in laying it in. The best way is to mix them right into the concrete itself, and be careful when you pour it in so it does not come in contact with the silo frame on the outside or the inside, and also be careful that those large stones do not drop and get outside the shape.

A Member. How far apart should the reinforcements be?

Mr. Ocock: If you have a silo 36 feet high and 14 feet in diameter, or even 12 feet, put the reinforcement rods six inches apart for the first five feet above the ground; then eight inches apart for the next five feet and ten inches apart for the next five feet, twelve inches for the next five feet, and so on. Use one-quarter inch mild steel rods. That is published in Bulletin 214 of the Wisconsin Experiment Station. If you haven't it, send for it. The reinforcement should be looped together, whether it be stone or whatever it may be. If you have a continuous doorway put rods across three-quarter inches in diameter, and hook the rods each across to the rods running up and down in the wall. Then bring in the reinforcement rods from the outside and hook them on the up-and-down rods any where you are a mind to.

A Member: Would you recommend tramping the silage while you are filling the silo?

Mr. Ocock: Yes, as hard as you can.

Mr. Scribner: How do you prevent the absorbtion of moisture into a concrete wall?

Mr. Ocock: If you make your concrete as it should be made and satisfy the demands of the cement, the cement will never demand any moisture from the silage.

Secy. Glover: Don't you recommend washing the inside of the silo with a mixture of cement and water?

Mr. Ocock: Yes, always. Finish off the inside with cement and water. If it be a block silo or a solid wall, a concrete, or a hollow tile silo, finish the inside of the tile silo

with plaster and wash all three with this mixture,—cement mixed with water to about the thickness of good cream. It may be put on to the wall with the stub of whitewash brush. You may have to do that every two or three years.

Mr. Delwiche: We have kept close accounting on our experimental farms. We find we can grow a crop of corn up to the time of harvesting without any interest on the investment and if we get a yield of fifteen tons per acre it will cost $15, that is, the preparing of the land and all up to harvest.

W. E. Tupp: Mr. Chairman, I want to take a moment to give figures on the cost of raising an acre of corn under Wisconsin conditions. The items are as follows:

Plowing	$4.00
Manure, 8 loads with spreader	4.00
Disking	2.00
Harrowing	1.00
Planting with machine	.50
Cultivating, five times	2.00
Cutting with binder and shocking	1.00
Interest and wear of machinery	3.30
	$17.80

COST OF MACHINERY.

Spreader	$45.00
Disk	38.00
Harrow	15.00
Planter	50.00
Binder	125.00
	$273.00
Ten per cent for interest and wear	27.30
Total	$300.30

CO-OPERATION AMONG FARMERS.

A. W. SANBORN, Ashland, Wis.

Every manufacturing business consists of two distinct parts; First: The production of the finished article. In order to produce the best article for the least money, the proprietor carefully looks after the several departments through which the product must go; installs an efficiency department by which careful account is kept of the exact cost of each article so the proprietor can determine whether he is producing his finished product at the lowest possible cost.

Second: The Sales Department. This is the marketing of the goods after they are produced and is a very important part of the business. No matter how efficient and well managed the manufacturing end, and no matter how cheaply the goods are produced, if they are not sold to people who want them and at a fair price he can not succeed. Therefore, the manufacturer employs the best man he can find to take charge of this department. The best market for his particular class of goods is found, and in such market the best prices and customers are obtained. The market is studied, and every effort made to please the customers by having the goods put up in the condition that will satisfy the customers.

Every farmer is a manufacturer; his business also consists of the two distinct parts, the producing and selling departments. The production part of the farmers' business requires practically all the time of the farmer, for as a rule, he is proprietor, manager, superintendent and laborer, all combined in one. The sales department of the farmers' business is sadly neglected, although very important. The farmer feels he has no time to look up the market conditions, to find the best market for a small lot of hogs, or cattle, or butter. He simply loads on to the wagon what he has to sell and starts out saying how much will you give me. Or, he goes to the city where he has heard there are several buyers, and expects to find competition, but, alas, he finds the buyers have an understanding with one another, and he can take what they offer or haul his stuff back home. If

any of our business men or manufacturers would load their goods on to wagons and start out saying, "How much will you give me," they would soon be in the hands of the bankruptcy court. Farming is the only manufacturing business that can stand that selling method and allow the proprietor to survive as a business man. How serious is the loss to the farmers each year, brought about by this selling method, or rather a lack of good selling methods. It is very hard to estimate, yet we know it is a very large amount. Hon. James Wilson, U. S. Secretary of Agriculture, estimates that only 46 per cent of what the consumer paid ever reached the farmers' pocket. This means that of every dollar the consumer pays, it takes 54 cents to carry that article from the farmer to the consumer. The farmer gets 46 cents for producing it and some one else gets 54 cents for carrying it to the man who uses it. Benjamin F. Yoakum, the railroad president, after a careful investigation estimated that the consumer paid about 14 billion dollars for the crop of 1910 and the farmer got about eight billion dollars of this amount. James J. Hill, president of the Great Northern railroad, reached about the same conclusion. It is not very far from the fact when we fix the amount at fifty cents, that is out of every dollar the consumer pays, the farmer gets fifty cents and the man who takes the goods from the farmer to the consumer gets fifty cents. The consumer paid about 10 billion dollars for last year's crop and it gave the farmer about 5 billion for producing it, and the other man about 5 billion for taking the product from the farmer to the consumer. This is too much. The farmer should get part of that fifty cents and the consumer should get part and still leave enough to carry the goods from the farmer to the consumer.

How can this condition be remedied?

By better sales methods on the part of the farmer.

How can the farmer reach better sales methods?

The answer unquestionably is, by coöperation. This has been demonstrated in several European countries. For forty years coöperation has been successfully practiced in all lines. The fundamental principles on which it rests have been firmly established. The farmers of Europe were driven to coöperation by the conditions that existed. It was, in many cases, coöpera-

tion or starvation. Such conditions have not yet existed in this country, yet it might be wise for the farmers of this country not to wait until the conditions mentioned arrive. Although driven to coöperation by such conditions, marvelous results have been accomplished. To arrive at the best methods for coöperative selling, Denmark is the country we should study carefully. Greater progress has been made there than elsewhere. Remember always that an efficient coöperative selling organization must be built from the bottom up and not from the top down. In this country we are apt to forget this fundamental principle, and try to start out with some great central organization, which for want of proper and reliable support must necessarily fail. Denmark is about one-fourth the size of Wisconsin with about ten million acres of land, about the same acreage Wisconsin has in the north part, undeveloped. Much of Denmark's ten million acres was formerly a bleak waste.

Agricultural coöperation began in Denmark in 1882, about forty years ago, with the establishment of one coöperative creamery. In 1908 there were 1108 coöperative creameries, handling practically all the milk produced for sale in the country. At present this little country ships about one million dollars worth of butter to England each week, and, as Sir Horace Plunkett stated recently in an address to the Wisconsin legislature, controls the price of butter in London. This little ten-million-acre country exported to England about fifty million dollars worth of butter; while Wisconsin, the great butter state of the Union sold only about 35 million dollars worth of butter in 1909. All of this butter exported by Denmark is sold at the top price. How is it done? By a successful coöperative system of producing and selling. People are thoroughly educated in the coöperative idea. Coöperative creameries were organized wherein each member contracted to deliver or furnish to the creamery for a fixed term, usually ten or fifteen years, the entire product of his herd of cows, under such rules and regulations as might from time to time be prescribed in order to secure uniformly good, clean product in the best shape for the market. The general policy is controlled by a committee or board of directors elected from time to time by the members, one man one vote instead of each share of stock one vote. The directors select the officers and appoint a competent butter

maker. Here we have the small unit, which is the foundation, firmly organized together by contract under penalties for failure to deliver their entire product to their society, each member knowing the other and all understanding what coöperation means and imbued with the coöperative spirit. When several of these coöperative societies are fully organized and in good working order, they combine and form a central body which has for its members each of these coöperative creameries, the president and secretary of each creamery forming the directors of the central body which elects the officers and selects the salesman and employees necessary to successfully inspect, grade and put into first class condition the product of the creameries who are members. Each member of this body agrees to furnish for a stated period, its entire product to the central organization to be placed on the market.

In Denmark there are six of these export associations, of which about eleven hundred coöperative creameries are members, the output of which in 1908 was about forty million dollars. Denmark also has 34 coöperative bacon factories with a membership of ninety-three thousand farmers, with a central coöperative selling society, all organized upon the same principles. In 1908, $1,545,000 worth of hogs were slaughtered to meet this trade. Denmark also has a Coöperative Egg Export Society made up of 550 central groups, each central group or society having as its members a large number of local organizations each of which contains at least ten members. In 1908, this Egg Export Society did a business of more than six million six hundred thousand dollars in eggs alone. Danish eggs bring fancy prices because they are always fresh, well sorted, well packed and guaranteed.

All of these societies are built up in the same manner, each unit first firmly organized, each member contracting his entire output for a fixed period under penalties which are enforcible and enforced; one man, one vote, profits divided according to product after paying on capital invested a fixed rate of interest.

Some of the essentials for the organization: First; a complete contract with each member for his entire product for a fixed period. Regular support is needed and is essential. You must know what you can depend upon each day. A large

product one day and small the next can not be economically handled.

Upon the organization of any coöperative society, those who are interested in making it a failure, immediately get busy. They approach each member trying to start dissension, offer him higher prices for his product than the society pays or can pay, or the market warrants, until member after member, through one means or another, is induced to desert, the society so crippled that failure for want of support is inevitable. Then the victims are left to be preyed upon as before. This has caused many failures and experience has taught that in self preservation, it is necessary to hold the members together by a complete contract to furnish their entire product for a fixed period, which period should be of sufficient duration to enable the society to demonstrate its usefulness to the members and defeat the efforts of its enemies to destroy it.

Second: In coöperative societies, that each member shall have an equal voice in the management. The holder of one share should have the same force as the holder of many shares. The control must not be in the large shareholder. Otherwise the large shareholders in a successful plant may be able to see more profit to themselves as individuals by turning over to themselves as private owners and manage with that end in view.

Third: Profits must be divided according to product furnished and not according to the money invested or number of shares of stock held by each.

In business corporations, profits are divided upon the basis of the amount of capital invested. If a corporation with a paid up capital stock of $10,000 makes a profit of $2,000 that is 20% —a dividend of 20% is declared and paid to the shareholders. If Jones has $100 worth of stock he gets $20 and if Smith has $1,000, he gets $200. This is considered fair as the money invested made the profit. In coöperation this method is considered unfair. To illustrate, in a coöperative creamery with $10,000 capital, Jones has $100 in stock and furnishes the product of 100 cows; Smith has $1,000 in stock and furnishes the product of 10 cows, quantity and quality from each cow being practically equal; $2,000 profit is made. This profit is made out of the cream furnished. Jones with his $100 in stock and

100 cows would receive only one-tenth of the profit that Smith would with $1,000 of stock and only ten cows. This is not fair but it took many years of bitter experience to learn this one lesson. Many societies failed by making this fatal mistake.

That $2,000 should be divided as follows: First, pay a fair rate of interest on the money invested by the stockholders, say 6%, which on $10,000 would be $600. This would leave $1400 to be divided among the members according to the value of the cream furnished by each, and of this $1400, Jones with 100 cows would get 10 times as much as Smith with 10 cows.

Fourth: Simple, plain, accurate accounts open to all at all times, with prompt, clear statements of each consignment or at short intervals, and prompt cash settlements at regular stated intervals. Books should be audited at regular periods.

Fifth: Capable management. Here is where the farmer is liable to fall down. He has not been educated to pay the price which commands the best ability in any line. For example, one butter maker may be very dear at fifty dollars a month, while another is cheap at a hundred dollars. You may lose money by employing a salesman at $1000 a year, and a man at $2000 a year may earn large profits for the society. You must have good capable men and in order to secure such it is necessary to pay what others are willing to pay for equal ability and responsibility. Usually officers and directors are paid no salaries in coöperative societies.

In Wisconsin we have one very successful coöperative society organized strictly upon the principles here presented. The Wisconsin Cranberry Sales Company is a coöperative society organized seven years ago with headquarters at Grand Rapids, Wisconsin, for the purpose of grading, sorting and marketing the cranberries raised by its members. This society united with the New England Cranberry Sales Company and New Jersey Cranberry Sales Company and formed the American Cranberry Company, with a capital of $9000 and managed by 9 directors, 4 selected by the New England Company, 3 by the New Jersey Company and 2 by the Wisconsin Company. All sales business is handled through the Central Exchange which remits 80 per cent of sales to local company, balance 20 per cent is kept until the end of the season when it is properly divided after deducting expenses and placing a

small per cent in the sinking fund. The Wisconsin Company handled 90 per cent of the cranberries of this state; 33,000 barrels were marketed in 1911 returning to the 40 growers a little better than $6 a barrel. A little more than $200,000 was divided among 40 men in cranberry producing business in Wisconsin, making an average of a little over $5000 to each man. Ashland has come to the point where its citizens realize that their betterment and their advancement lie with the country, and you, brothers from the country do not think for a moment you can get along without the help of the city. Our fortunes are tied together, and these business men in the city of Ashland are working just as hard,—yes, harder than you farmers are doing. There has been in the past more or less a lack of the spirit of appreciation on the part of our farmers; and I say that as a farmer myself, but I rejoice to say I have been brought up on a farm and lived there all my life, and I will say to you farmers, it is up to you now to make good on this proposition, to get right out in this spirit and help things along. You are not going to be lifted all the while and these people are not going to banquet you all the time; it is up to you to show the goods, to organize, to work for your own betterment. That is the only way you will ever attain the high ideals we have in mind.

AFTERNOON SESSION, Dec. 12, 1912.

President Jacobs in the Chair.

Reports of Committees called for.

The Committee on Resolutions reported as follows:

Believing that the tuberculin testing of cattle in the state has been of great value in the improvement of her dairy conditions, as well as giving her an enviable reputation among the other states, as a state from which healthy animals can be purchased, and believing that the remuneration given by the state in helping to pay for animals reacting to the tuberculin test has been of great value in bringing about this condition, and

Whereas, the present law regarding any part of payment of animals by the state for animals reacting to the test will cease on July, 1913, therefore, be it

Resolved, that the Wisconsin State Dairymen's Association, in forty-first annual convention assembled recommend to the coming legislature that the time limit be extended two years, believing it to be for the best interests of the dairy business of the state.

Resolved, that the Wisconsin Dairymen's Association assembled in its 41st annual convention respectfully represents to the Congress of the United States its profound conviction that in the interest of honesty and commercial morality there can be no honorable compromise between the advocates of pure dairy products and the manufacturers and sellers of oleomargarine until it is made difficult if not impossible for oleomargarine to masquerade as butter. The dairymen of the United States are willing to accept all the results of honest competition, but they protest that a substitute for butter so cunningly devised and colored that its true origin and composition cannot be detected except by scientific experts, cannot be considered as honest competition. They therefore respectfully petition Congress to enact legislation that shall effectually safeguard the public and especially those of limited means from imposition, either by totally prohibiting the manufacture of oleomargarine in any shade of yellow resembling butter, or by placing such a tax upon the colored article as shall make its manufacture unprofitable.

Whereas, coöperation among the dairymen, both in method of production and the selling of the product, would be of mutual benefit, both to the producer and consumer, by causing a better article to be furnished at a more reasonable and uniform price, and

Whereas, the work of educating the dairyman along proper coöperative lines may well be intrusted by the state to an agency in which the dairyman has confidence as practical. Therefore,

Resolved, that we urge upon the legislature of the state of Wisconsin the urgent necessity of practical teaching of coöperative methods, that the appropriation to the Wisconsin Dairymen's Association be increased to such an amount as will enable this association to carry on such work in addition to the work now being carried on.

For the Committee on Nominations Mr. Goodrich reported as follows:

Mr. Goodrich: Your Committee on Nominations has had the subject under consideration and we place in nomination and ask the election of the present officers for the next year, viz: President, E. C. Jacobs; secretary, A. J. Glover; treasurer, H. K. Loomis.

On motion, duly seconded and put by Mr. Goodrich, the recommendations of the committee were adopted and the officers therein named declared the duly elected officers of the association for the ensuing year.

AGRICULTURAL PROBLEMS OF THE LAKE SUPERIOR REGION.

E. J. DELWICHE, Ashland.

The Lake Superior region in common with other new or partly developed agricultural sections has certain problems waiting for solution. Some of them are peculiar to the section itself. The purpose of this paper is to discuss a few of the more pressing of these problems without attempting to cover the entire field.

No matter so vitally concerns the new settler in this region as the clearing of the land so as to make it produce crops. How to cheapen the cost of clearing, render the labor of it less arduous, and do the work more rapidly, are problems well worthy of serious thought and effort. I do not propose to solve all of these. I only wish to offer some suggestions regarding them. In the first place, it seems to me that the farmer on cut-over land in the clay belt which extends along Lake Superior from Michigan to Minnesota, should attempt to get rid of the brush first and get pasturage to take its place. This brushing need not necessarily cost much money but subsequent sprouting of the brush should be checked immediately. This can best be done by grazing closely with sheep and other animals. Goats have been found effective for this purpose but I think in the long run it is preferable to use sheep. Cattle also do well but are not so effective in keeping down the willows and poplars as sheep are. Some settlers will clear and

stump all the land their resources will allow without paying any attention to brushing ahead. I think this is a mistake as much good can be gotten out of the land before the stumps are entirely removed. From what has been said before, it must not be inferred that the removal of stumps should be deferred any longer than necessary. On the contrary, it is next to impossible to work the ground properly before the stumps have been removed.

CHEAP EXPLOSIVE NEEDED.

The problem is now "How can we get rid of the stumps most cheaply"? In clearing our new Experimental Farm at Ashland Jct., we have come to the conclusion that blasting with dynamite or the use of dynamite in conjunction with a good stump puller gives best results. Thus the problem resolves itself largely in working out means of getting a cheap explosive. Farmers ought to be able to get dynamite at considerably lower prices than is true at the present time. The retail price for dynamite in lots of 500 pounds or less is $14 per hundred pounds. The wholesale price in carload lots is $10.50 approximately. There seems to be a rather large difference between the retail and the wholesale prices. Of course, handling dynamite is rather expensive. It seems to me that right here is a splendid chance to coöperate and buy in carloads. Already there is a nucleus for such coöperative associations in a good many sections. The Bayfield Fruit Growers' Association buys dynamite for its members and sells at 11c from the car and 11½c from the magazine.

LAND CLEARING COMPANIES.

Another need with respect to this matter of land clearing is competent land clearing companies who will contract for clearing at a certain rate per acre. While a majority of farmers will prefer to do their own clearing and hiring help as they see fit, there are also a number of people who would be glad of the opportunity to let out blocks for clearing each year. There is no question but that a well trained gang with the proper outfit can work more effectively than the ordinary farmer can. During the last few weeks the writer has re-

ceived many letters asking for just this kind of help. I hope the day is coming when land clearing companies will be just as easy to get as those for buildings or other work.

CHEAP MONEY FOR FARMERS.

Closely connected with the problem of land clearing is that of borrowing money for farm improvement. At the present time farmers in this section seldom can get money for as low a rate as 6%—oftener they have to pay 8% or even 10%, and yet there are millions of dollars deposited in Northern Wisconsin banks at low rates of interest. It seems very peculiar that such good security as improved farm lands has to pay such exorbitant rates for money. Nothing would be of greater value to the development of the unimproved land of Wisconsin than cheap money. There is no reason why farmers could not borrow money on as good terms as can be gotten for other industries. I think it is high time that some system was in vogue similar in effect to those in operation in Germany and other European countries whereby farmers can get money at a low rate of interest and on long term payments. Steps towards those ends are now being taken up by both state and federal governments. Cheaper money for developing farms is one of the things most sorely needed at the present time and it is sincerely to be hoped that laws be enacted and organizations formed whereby farmers can borrow money on the right terms.

LAND SPECULATION A BAD THING.

Another problem of an economical nature which confronts the Lake Superior region, as well as other sections in Northern Wisconsin, is the holding of large tracts of land by speculators at prices out of proportion to the actual value of the land. A large amount of land through this region is being so held and it will be a great boon to the country when our taxation systems are so arranged as to discourage the holding of large tracts for future rise in value. The system which taxes the developed land at a higher rate than the undeveloped land adjoining it works against a rapid settlement of the country.

GOOD COUNTRY ROADS.

The development of the country is to quite an extent effected by the quality of its roads. It will be of the greatest help to the opening up of this region if good systems of roads leading into new settlements are established. It does not seem feasible to establish macadamized roads in all cases, but rather, for quite awhile we will have to depend on good dirt roads—these to be properly constructed and under the guidance of men who understand the work. State aid should be forthcoming for the building of these by-ways as well as for main roads between cities and towns. There are many sections in the northern counties which are well adapted to farming but which, owing to lack of proper roads, are not attractive to settlers. There is a difference to be recognized in lending state aid to roads in the north as compared with the developed sections in the southern part of the state. Good automobile roads connecting the principal towns are a fine thing but a good dirt road leading out into new settlements is of greater importance in helping the development of the region.

SOIL MANAGEMENT.

The things discussed previously were largely economical in their nature although intimately connected with the agricultural development of the region. Of the strictly agricultural problems, soil management occupies first rank. The red clay soils of this section are naturally very fertile when properly handled, but in different systems of farming they cannot be classed as very productive. One of the first things to be considered in the development of level red clay soil is drainage. The problem would be a serious one if it were not for the fact that good outlets can be found in almost all localities. It is necessary to open up and maintain surface ditches. The permanent ditches can usually be laid out on the margins of land descriptions and thus not interfere with farm operations to any extent. Then the land should be plowed in narrow lands, say two rods wide, with straight open dead furrows in the center. By applying such a system it is believed that practically all the red clay lands can be put in ordinary farm

crops. Tiling would undoubtedly be resorted to in special cases. It is quite probable that ultimately, as the land gets more valuable, it will be found profitable to tile much of the area in question, but for the present I think it will be found more economical to rely on well laid out systems of surface ditches.

CROPS TO GROW.

The one great drawback to productivity with a good many farms in this region is leaving the land in timothy hay for long periods of time. As a result the land becomes hard; dandelions, buttercups and wild grasses gradually take the place of the hay and yields become low and unprofitable. For instance, at Superior last spring the state experiment station started a new demonstration farm on land which has been in hay for seventeen years. This land produced less than one-half a ton of hay under natural conditions. When plowed up in spring and put into oats and peas, a yield of nearly two tons per acre was obtained. Similar results were obtained at Ashland on the old substation farm. Two things in which these soils are naturally deficient are humus and nitrogen. Fortunately these two elements of soil fertility can be restored by the growing of clover and leguminous crops (and certainly no section grows these crops more successfully). Clover pays well here both when grown for forage and for seed.

CROPS FOR NEW LAND.

New settlers are often at a loss as to what to put on new land as a first crop. We have found flax a good cash crop for that purpose and have obtained yields of from eight to fifteen bushels per acre on new breaking. Where feed is desired oats and peas are excellent. If the ground has been burned over severely, and consequently, is low in nitrogen content, it may be advisable to give the oat and pea crop a light dressing of sodium nitrate, using, say 100 and 150 pounds per acre. This will cost from $2.75 to $4.50 per acre.

FALL PLOWING ADVOCATED.

Fall plowing is by all means to be recommended; in fact nothing else is equal to it in normal seasons. As for the rotation to follow we suggest a three or four-year rotation to consist of small grain seeded to clover one year, clover one or two years, cultivated crops such as corn, rutabagas, potatoes, cabbage, one year, and then repeat.

STATION BRED VARIETIES OF GRAIN AVAILABLE.

The problem of varieties of grain and forage crops to be grown in this region is being solved through the experiment station work at the different stations. Experiments are in progress with all the different classes of farm crops and at the present writing we feel able to advise intelligently. The station is now breeding up varieties of grain and forage crops with special reference to this region and disseminaton of these new strains is already begun. We invite correspondence from interested parties with respect to this and other agricultural problems.

FEEDING PROBLEMS.

So far as the problem of feed for stock is concerned, it is not hard to solve since we can grow all the roots and small crops to perfection. While corn is not a sure crop when grown for grain on the heavy soils, on land in good state of cultivation there is no trouble in growing first-class corn for silage. We have had yields as high as eighteen tons of silage corn per acre. Root crops can be grown abundantly and we urge every dairyman and stock raiser to grow roots. Yields of over 800 bushels of roots per acre have been obtained.

COMMUNITY BREEDERS' ASSOCIATIONS.

Nothing has been said with reference to coöperative breeders' associations and other agencies which have to do with the betterment of live stock conditions, as these matters have been thoroughly discussed by other speakers. We believe that live stock farming is one which it is necessary to follow for best results in most sections of the state, and we cannot

urge too strongly that right methods be followed in regard to this important branch of agricultural industry.

CONCLUDING REMARKS.

The Lake Superior region has its own problems to meet, none of which are insuperable. Most of them are in the course of solution at the present time. The interest manifested by all classes of people in the development of the agricultural resources is now great and is growing rapidly. We urge the coöperation of farmers and city people in the solution of some of the problems discussed. We respectfully want to call the attention of our state and national governments to the opportunities for constructive legislation to hasten the development of the millions of acres in the Lake Superior and other upper Wisconsin regions. When this undeveloped region is once made into farms it will mean the addition of untold wealth to the state tax roll. This in turn will help to lessen the burdens of taxation on the older regions. For every dollar spent in developing this region, a hundred-fold will be returned in the future.

DISCUSSION.

A Member: Would there not be some way for the state to take hold of the dynamite question? It seems to me the hardest the settler has to contend with.

Mr. Delwiche: You are right. There is a movement on foot now to form a company which will manufacture dynamite along the lines I have spoken of. They are looking for information. The only information I could get we had to pay a fabulous price for. I believe the obtaining of cheap dynamite is one of the first and biggest problems we have to meet. It has been suggested by some one that the convicts at Waupun be put to work to dig out the Niagara limestone for the farmers. We ought to have a factory in northern Wisconsin to manufacture it and sell it to the farmers at cost price.

A Member: Is it a fact that dynamite is sold to the mining companies of the west 25 per cent cheaper than they sell to dealers here?

Mr. Delwiche: That is what is claimed, and I have good reason for believing it is true.

A Member: Isn't there some way that can be remedied?

Mr. Delwiche: I believe there ought to be.

A Member: I say let the state of Wisconsin take hold o this dynamite question so we can get hold of cheap dynamite Can you tell us if the Bayfield Association sells dynamite t to the mining companies of the west cheaper than we ar getting it?

Mr. Delwiche: No, I do not think so, I have quoted th price they will give us. The Bayfield Association sells at cos price to other people. It is selling at ten and a half from the car, and eleven cents from the magazine, as I understand it. It is certainly worth investigation.

Mr. Sanborn: When I was in the General Assembly in Madison, I tried to find some way by which the state could furnish cheap dynamite to the farmers in the northwest and northern part of the state. I ran against a mining man of high station in life and business and I considered his word perfectly reliable. He told me he could buy dynamite as a mining man, from 8½ to 9 cents a pound in 500 pound lots, if necessary. I asked him if he would put that in writing, so I could use it. I knew his situation and he was perfectly honest about it,—but he said his situation was such he could not do that, but if it ever came to the test he could get the bills showing he could buy dynamite at that time at from eight to nine cents in 500 pound lots, only he had to do it in the name of the mining company. Now, if that is the status of our dynamite trust, that they are selling cheaper to one man than to another, I think it is a crime and should be taken in hand by the state. The authorities should be able to get at that thing and root it out, and know for certain that that is the state of affairs, and if so, punish it. At that time we farmers were paying thirteen and one-half and fourteen cents for dynamite and we could not get it for less unless we bought a carload at twelve and a half cents. The dealers had to have their rake-off and in many cases they were in the combine with the manufacturers against the consumers. It is a fact with most all manufacturing institutions that the consumer as an individual cannot buy any wholesale lots at all; they will not sell to you. I know this to be a fact from individual experience. You must buy through the dealer, the jobber. They protect their jobbers and dealers all through the country and give them a rake-off in every way. We tried to buy in wholesale lots

and at wholesale prices, but that was impossible. Now, it seems to me that the manufacturer stands very much in his own light not to sell to the farmers as cheaply as any other man; that the development and the increase of business will not only develop the country but it will increase the business of the manufacturer of the dynamite, because there will be so much more of it used. I have cleared about 150 acres of land in the last few years and the cheapest way in the world is with dynamite if you can get the dynamite at a fair price. If I could buy dynamite at eight or nine cents a pound, I would sooner use it than any machinery that has ever been invented yet. I have seen steam power work in our district and it is a good machine, does the work, but it is not the thing for the small farmers to use unless they combine and buy one and use it in partnership, because they are too expensive. They cost from $2000 to $2500 a piece. Then again, after you get your stumps cleared with that kind of a machine, you have more work to get rid of these stumps and clean up than you have to pull them. You can pull stumps with fair expedition with an ordinary stump puller but you can't get rid of the stumps after you pull them. Now, with dynamite the stumps are blown into pieces and you can handle them with men and horses, easily. Another very important proposition is the tax question that Mr. Delwiche touched upon. The tax assessor comes along and he thinks that land is worth more than land with stumps and brush on,—and it is no doubt. But is it fair for the man who has done that work, to pay two or three times the amount of taxes that the man right alongside of him pays? Sometimes it simply puts him out of business. I believe cleared land should be taxed no more than uncleared land. In that way the taxes can be equalized, and each man, the one who owns the cleared land and the one who owns the stump land, can get along all right.

A Member: I suggest it would be a good plan to instruct our assemblyman, who is present, and our state senator, when they go to Madison, to use their influence in this dynamite matter, either by investigating the trust business or by voting to establish a dynamite plant the same as they do in some other places. I move that we instruct our assemblyman and senator to that effect. Motion seconded, put and carried.

The Chairman: I am not going to make a speech, but I want to thank the good citizens of Ashland first for writing us and asking us to come up here. I was not very highly impressed with the idea when I first got the letter, but it grew upon me, and it has been growing upon me so fast that I don't know that I want to go home at all. In behalf of myself and my coworkers, I want to say that we are highly pleased and gratified that we came to Ashland, and with the results of this meeting, and we shall go away feeling that we have done a little good,—at least hoping so.

THE FARMER AS A BUSINESS MANAGER.

D. H. Otis, Madison, Wis.

To be successful the farm must be properly equipped and properly organized and managed. It is not possible to systematize farm operations as completely and thoroughly as is possible with manufacturing enterprises. The farmer must necessarily deal with many forces and conditions over which he has no or only partial control. Nevertheless, the farm offers a big, broad and promising field for the man who will use his skill, judgment, and executive ability in studying and organizing his farm according to business practices.

At the present time, very few who engage in farming have a comprehension of the business side of the industry. For instance, how much capital does it take to run a farm, and how much of this capital is invested in land, in buildings, and other equipment. Is there any danger of putting too much capital into buildings or equipment, and if so, what is the limit? On the other hand, is there any danger of a man being unsuccessful in the handling of a farm because of lack of capital? Will it pay him to borrow at a fair rate of interest in order to increase the efficiency of his efforts on the farm? What distinction should be made between the borrowing of capital for production purposes as compared with borrowing for personal expenses?

The young man who enters into farming as a business should have some conception of what are the necessary expenses in running the farm, and what he may reasonably expect in receipts. Also what are the opportunities for growth and expansion and is his land and his live stock likely to increase in value?

In connection with the work in Farm Management at the University of Wisconsin, an effort is being made to answer some of these questions that come to the man who wishes to engage in farming. We have been visiting a number of Wisconsin farms and have gathered data from the actual conditions as to how much capital is invested in various phases of farm business and also the receipts and expenditures for one year. The work thus far performed has been with two sets of farmers; one with taking the farmers as they come regardless of any reputation that they have made in their business. The other has been by taking some of the best farmers that we could find anywhere in the state. The tables that follow give some of the results that we have found in connection with our investigations.

SERIES A. TABLE I.

FARM CAPITAL ON DAIRY FARMS TAKEN AT RANDOM.

Farm.		Capital Invested in					
No.	Acres.	Land.	Improvements.	Equipment.	Livestock.	Cash.	Total.
1	160	$8,895	$2,105	$500	$1,497	$50	$13,047
2	240	19,000	5,525	1,128	2,198	50	27,901
9	160	11,910	4,090	860	2,104	50	19,014
10	140	8,350	1,883	445	1,090	25	11,793
12	160	11,500	4,500	774	2,145	100	19,019
13	300	18,000	3,000	1,778.50	4,580	300	27,658.5
14	320	25,610	6,390	1,238	4,455	100	37,793
16	120	9,000	3,500	600	1,545.50	50	14,695.5
20	160	10,760	5,240	820	1,192	50	18,062
21	80	5,825	4,175	550	1,266	25	11,841
Average	184	$12,885	$4,040 80	$869.35	$2,267.25	$80	$20,082 4

SERIES B. TABLE II.

FARM CAPITAL ON SPECIAL DAIRY FARMS TAKEN AT RANDOM.

FARM.		CAPITAL INVESTED IN					
No.	Acres.	Land.	Improvements.	Equipment.	Livestock.	Cash.	Total.
1,004	115	$11,845	$5,405	$1,255	$2,760	$300	$21,565
1,006	244	21,200	8,800	3,190	17,925	400	51,515
1,007	160	10,400	9,600	1,090	11,225	400	32,715
1,008	89	12,075	4,925	900	7,655	200	25,755
1,011	253	24,470	13,480	1,805	12,510	2,000	54,365
1,012	163	11,590	5,410	875	11,863	350	30,088
1,015	143	8,800	5,700	652	10,340	500	25,992
1,017	160	12,750	7,250	800	5,694	1,500	27,994
1,018	158	13,161	3,839	530	7,137	100	24,767
1,020	87.5	7,670	5,455	425	7,815	200	21,565
Average	157.25	13,396.10	6,986.40	1,162.20	9,492.40	595	31,632.10

SERIES A, TABLE III.

FARM EXPENSES ON DAIRY FARMS TAKEN AT RANDOM.

FARM.		EXPENSES FOR							
No.	Acres.	Stock purchased	Feed.	Supplies.	Improvements and repairs.	Rent, taxes and insurance.	Labor.	Interest.	Miscellaneous.	Total expenses.
1	160	.....	.....	$43	$39	$115	$85	$652	$182	$1,116
2	240	2	.....	93	104	150	640	1,395	168	2,552
9	160	.....	590	107	486	108	381	951	84	2,707
10	140	11	50	41	448	71	136	588	.....	1,345
12	160	15	66	58	251	68	260	951	.....	1,669
13	300	70	130	558	165	110	1,561	1,383	527	4,504
14	320	120	200	490	115	182	1,051	1,890	15	4,027
16	120	8	273	167	68	75	318	735	212	1,856
20	160	532	.....	252	892	83	674	903	50	3,391
21	80	10	75	176	95	51	165	592	148	1,312
Aver'ge	184	76.8	138.4	198.5	266.3	101.8	523.5	1,004	138.6	2,447.9

SERIES B. TABLE IV.

FARM EXPENSES ON SPECIAL DAIRY FARMS.

FARM.		EXPENSES FOR								
No.	Acres	Stock purchased	Feed.	Supplies.	Improvements and repairs.	Rent, taxes and insurance.	Labor.	Interest.	Miscellaneous.	Total expenses.
1004....	115	$755	$75	$257	$663	$252	$1,520	$1,078	$50	$4,650
1006.....	244	300	381	1,080	280	175	2,186	2,591	300	7,293
1007.....	160	425	600	189	1,096	140	1,150	1,636	200	5,436
1008....	89	350	500	113	105	240	785	1,288	190	3,571
1011.....	253	.....	933	750	597	477	2,497	2,718	318	8,270
1012.....	163	955	556	117	428	193	1,024	1,504	298	5,075
1015.....	143	1,315	550	126	395	105	1,274	1,200	100	5,165
1017....	160	3,028	600	130	71	130	1,114	1,400	.....	6,473
1018.....	158	1,257	292	270	145	175	1,479	1,238	.....	4,856
1020.....	87.5	.....	408	121	103	119	845	1,078	338	3,012
Aver'ge	157.5	838.5	489.5	313.3	388.3	200 6	1,387.1	1,583.1	179.4	5,380 1

SERIES A. TABLE V.

FARM RECEIPTS ON DAIRY FARMS TAKEN AT RANDOM.

FARM.		RECEIPTS FROM						
No.	Acres.	Crops sold.	Live stock sold.	Live stock products	Increased inventory.	Other sources.	Total receipts.	Net profits.
1	160	$112	$770	$305	.....	.....	$1,187	$71 00
2	240	474	1,084	1,625	24	.....	3,207	655 00
9	160	.....	1,086	1,250	461	100	2,897	190 00
10	140	200	491	675	539	.....	1,905	560 00
12	160	.....	1,511	1,329	530	.....	3,370	1,701 00
13	300	570	1,198	2,476	458	10	4,712	208 00
14	320	48	2,444	1,930	1,500	.....	5,922	1,895 00
16	120	.....	1,259	850	150	45	2,304	448 00
20	160	.....	520	901	1,632	.....	3,053	—338 00
21	80	.....	776	257	221	.....	1,254	—58 00
Average	184	$140.4	$1,113.9	$1,159.8	$551.5	$15.5	$2,981.1	$532.8

SERIES B. TABLE VI.

FARM RECEIPTS ON SPECIAL DAIRY FARMS.

Farm.		Receipts from						
No.	Acres.	Crops sold.	Live stock sold.	Live stock products	Increased inventory.	Other sources.	Total receipts.	Net profits.
1004	115	$140	$498	$3,925	$1,089	$135	$5,787	$1,137 00
1006	244	.....	4,580	3,200	580	.....	8,360	1,067 00
1007	160	502	3,230	2,167	1,141	650	7,690	2,254 00
1008	89	270	2,929	2,500	695	.....	6,394	2,804 00
1011	253	1,249	5,155	5,546	1,042	187	13,129	4,859 00
1012	163	420	4,050	2,800	325	.....	7,595	2,520 00
1015	143	.....	4,672	3,200	3,175	.....	11,047	5,882 00
1017	160	115	3,435	2,403	4,092	.....	10,045	3,572 00
1018	158	605	2,519	4,006	605	10	7,745	2,889 00
1020	87.5	94	2,150	2,080	53	.....	4,377	1,365 00
Average	157.5	$339.5	$3,321 8	$3,182.7	$1,279.7	$93.2	8,216.9	2,834 90

In Series A the farms vary in size from 80 to 320 acres. It is interesting to note the amount and the distribution of capital on these farms.

CAPITAL INVESTED IN LAND.

This varies considerably with the amount and character of the land. Comparing the capital invested in land as recorded in Series A, Table 1, with the same items in Series B, Table II, it will be noticed that the value of the land is on the average, slightly higher in Series B, although the average difference is only about $11 per acre. The acreage, however, is some greater in Series B, the average difference being about 12 acres per farm and may be accounted for by the tendency of some farmers to buy larger areas of land and farm it perhaps less extensively.

CAPITAL INVESTED IN IMPROVEMENTS.

Under this head are included buildings, fences, and water systems. It will be noted that in Series A, the smallest amount invested in equipment is the same farm that has the smallest amount invested in land, viz. No. 10, 140 acres. The largest amount invested in improvements is also the farm that had the largest amount invested in land, viz. No. 14, a farm of

320 acres. There are several other farms as Nos. 2, 9, 12, 20 and 21, that have comparatively large amounts invested in improvements. By comparing these farms with the net profits obtained from them, Table III, it will be seen that large profits are not necessarily associated with those of the largest capital invested in improvements.

Comparing the capital invested in improvements, Series B has a much larger amount than Series A. The average for the ten farms being $6,986.40 as compared with $4,040.80 in Series A. In Series B as well as in Series A, the largest net profits are not necessarily associated with the largest investment in improvements, although the farm (No. 1011) showing next to the largest net profits is the farm that has $13,480 invested in improvements. The farm that gives the largest net profits (No. 1015) has only $5,700 invested in improvements. It will also be noticed that farm No. 1008 containing only 89 acres has an investment of only $4,925 in improvements and yet has a net income of $2,804, while the largest amount of capital invested in improvements is not necessarily associated with the largest net profit. It is interesting to note that those who have a large investment in improvements, are, as a rule, not only paying a good interest on that investment but they are also receiving good net returns from their farms.

INVESTMENT IN EQUIPMENT.

Under this head is included dairy supplies and utensils, farm machinery, tools, wagons, carriages, etc., harness and office equipment. From Series A. we notice that this equipment varies from $445 with farm No. 10, to $1,778.50 with farm No. 13. Here again it is impossible to associate the largest equipment with the largest net profits, (Table III) although the farm having next to the largest equipment (No. 14) is the farm that has the largest net profit. Farm No. 12 with a net profit of $1,701 has an equipment valued at $774. Farm No. 13, with an equipment of $1,778.50 shows a net profit of only $208. In comparing the two series, it will be noticed that the investment in equipment is considerably larger in Series B, the average investment being $1,162.20 against $369.35 or a difference of $2.65 per acre.

Farm No. 1006, with an equipment valued at $3,190 has a net profit of $1,067. The next largest farm in equipment is No. 1011 with an equipment of $1,905 with a handsome income of $4,859. Farm No. 1015, however, has an investment of only $652 in equipment and yet has an income of $5,882. In general, it will be noticed that the farms with a large amount of equipment are also farms that are producing good net profits.

INVESTMENT IN LIVE STOCK.

In Series A, this varies from 1090 with Farm No. 10 to $4,580 with Farm 13. In this instance the farm with the smaller equipment in live stock shows the larger net returns. A study of the factors entering into this show that Farm No. 13 this year had a large expense in the way of labor, supplies, and decreased inventory besides the rather large annual expense for interest on a comparatively large investment. Farm No. 14 with an investment of $4,455 in live stock shows a net profit of $1,895, the largest profit of any farm listed in Table I. It is also noticeable that Farm No. 1, with an investment of only $1,497 in live stock had a net profit of only $71.00 and that Farm No. 20 with an investment of only $1,192 in live stock fell behind after paying interest $338, and that Farm No. 21 with $1,266 invested in live stock, fell behind $58.00 after paying interest.

In comparing Table II, it will be noticed that the largest investment in live stock has the lowest returns for net profit. On the other hand, Farm 1008 has only 89 acres and yet has a total of $7,655 invested in live stock and has a net profit of $2,804. It will also be noted that Farm 1011 has a large capitalization in live stock and likewise has a large net profit. Farm 1015, however, has 10,340 invested in live stock and has the largest profit of any of those listed, viz. $5,882. It should be stated, however, in connection with this farm that this was an exceptionally good year and in running over the results with owner, he stated that he had a large crop of excellent calves and all did well and that his sales from live stock and his increase in inventory accounts for the large income, and it is a question whether he can keep up this record for the coming year. In spite of the exceptions mentioned the table seems to show that the large investments in cattle are associated with the large net profits.

CASH RESERVE.

Under this head is included the cash that is needed to meet any emergencies that may arise from the first of one month to the first of another month, such as buying a new cow or paying off a hired man. It is the amount that the farmer feels he must have in the bank after paying his monthly bills in order to meet any sudden and possibly unexpected bills that may arise. It really amounts to idle capital in the bank for which the farm should pay interest.

It will be noticed that in Series A, this amount varies from $25 to $300, the average being $80. In Series B, it will be noticed that the amount varies from $100 to $2,000. The average in this instance being $595. Eliminating No. 1011 which is exceptionally large, the average would be $405. It will be noticed that those farms with the largest investment in live stock, which are also the farms that usually have pure bred live stock, require a larger cash reserve. This is a factor of considerable importance. Not infrequently an opportunity presents itself to make purchases of live stock, feed and other things needed by the farm, at a bargain, provided a man has or can obtain the necessary cash to complete the deal. In some instances the farmers report that rather than keep a large cash balance they would prefer borrowing at the bank when needed, and perhaps make an arrangement with the banker whereby he can overdraw his account, but either cash or credit is almost as necessary in the conduct of the farm, the same as in other business enterprises.

TOTAL CAPITALIZATION.

In Series A, this varies from $11,793 to $37,793 with an average of $20,082.40 and in Series B it varies from $21,565 to $54,365 with an average of $1,632.10. We find here the same variation that we have found in land, improvements, equipment and in live stock. It is interesting, however, to see that as the farms improve and as the capital increases, as shown in Series B, the farms are not only able to pay for the increased investment in the form of interest but they are also able to return to the owner, handsome profits for his ability as a business manager.

In Series A, Table III, it will be noted that the expenses are comparatively small with the exception of Farms 13, 14, and 20. With the exception of Farm 20 very little was spent for live stock. Of what this farm spent, $200 was for a work horse. Only four of the ten farms spent over $100 for feed. When it comes to labor only two farms ran over $1,000, while the expense for interest, was of course, proportionate to the capital invested.

In Series B, Table IV, it will be noted that the expenses run much higher than in Table III. The average expense for the ten farms is $839 against $768 for stock. $490 against $138 for feed, $313 against $198.5 for supplies, $388 against $266 for improvements and repairs, $201 against $101 for rent, taxes and insurance, etc., $1,387 against $523 for labor and $1,583 against $1,004 for interest. The total expense per farm amounts to $5,380 against $2,448. This it will be seen is an expense of $3,201 more than the average expense recorded in Table III.

As the equipment increases, the volume of business also increases or vice versa, and this necessarily increases the items of expense, but it is gratifying to know that the farms are able to meet this expense and still make as much and in most cases more money than where the equipment is small. The total expenses do not vary exactly with the net profit, but it will be noted in most cases where there is a large expense, there is likewise a large net profit. There are some notable exceptions to this, however, particularly with Farm 1008, where the total expenses amount to $3,571 while the net income very nearly reaches this figure, viz. $2,804. In Table III, Farm No. 13 spent $4,504 while the net returns Table III, were $208. In a similar manner, Farm No. 20 spent $3,391 and showed a net loss of $338. While there is no question but that money wisely spent for productive property will, under good management, bring excellent results, it is also true that one must carefully consider the various items for which he is spending his money and satisfy his own mind that the conditions as they exist on his farm will justify the expenditures. Many a man with ample capital has jumped into farming and in order to get things started quickly has not hesitated to spend large sums of money, with the result that the farm is

either over-capitalized or not capitalized in the right direction and it is impossible for the owner and probably for anyone else to make the farm a paying proposition.

FARM RECEIPTS.

The receipts from the farm are grouped under: crops sold, live stock sold, live stock products sold, increased inventory, and other sources.

In Series A, Table V, it will be noticed that about one half of the farmers have an income from the sale of crops, while, in Series B, Table VI, it will be noted that all but two of the ten have an income from the sale of crops. All the farms in both series have considerable income from the sale of live stock. In both instances this amounts to about the same as was received for live stock products. In Series A, the live stock products slightly exceed and in Series B, the sales of live stock are a little more than live stock products. Of course, the amount received varies considerably; those in Series B, Table VI, receiving nearly three times as much from the sale of live stock as those in Series A, Table V.

Nearly every farm shows an increased inventory and here the amount varies greatly. On an average the farms in Series B, Table VI, show nearly two and a half times as much as those in Table V, Series A.

As is naturally to be expected, there is a great variation in the total receipts in both series. In Series B, Table VI the average is nearly three times greater than in Series A, Table V.

NET PROFITS OR LABOR INCOME.

In figuring the net profit, the farm has been charged with all the labor put on it except that of the farmer himself. It includes the work performed by other members of the family and also includes the board of the laborers. The net profits can very properly be called the labor income which goes to pay for the farmer's time and for his ability as a manager.

In Series A, Table V, it will be noted that the profits vary from a loss of $338 to a profit of $1,895. In Series B, Table VI, the net profits vary from $1,067 to $5,882; the average for

the ten being $2,835. In Series A, Table V, the average was only $533. In other words, those in Series B, made nearly six times as much net profit as those in Series A.

WHY THE DIFFERENCE?

When one undertakes to study the farm as a whole, he realizes that there are many factors that enter into the problem of why the farm pays or why it does not pay. And it is difficult if not impossible for anyone to point out all the causes that may contribute to the result.

One of the most prominent factors is the man himself, or what we sometimes call the personal equation. This is something that is difficult to measure and still harder to express. It is, however, indicated by the general appearance of the farm, the character of the live stock, and in the financial results that he obtains in handling the farm as a business proposition. But more than this, it is expressed particularly in the comprehension that the man himself has as to the possibilities that lie inherent in his soil, in his crops and in his live stock. If the man realizes what it means to maintain and even increase the fertility of his soil; if he understands how to select his seed; how to prepare the seed bed and cultivate his crops so as to get the largest yields; if he understands how to handle his cattle, whether pure bred or grades, so as to get the largest returns for feed and labor expended and at the same time so manages his herd that it is constantly increasing in quality as well as quantity, if his vision is broad enough so that he can comprehend all of these problems and coördinate them and bring them together so as to get the largest net results, though not necessarily financial results, we believe that he is to be considered as an up-to-date, thorough-going, progressive farmer.

In looking at the results obtained in these investigations one is struck first of all with the lack of appreciation of soil preservation or conservation. This is fundamental to all other farm operations.

The next factor that impresses one is the lack of ability or knowledge of how to select and improve the seeds used on the farm. By the proper selection of seed, it is possible to mater-

ially increase the yield of crops without adding any extra expense to the preparation of the soil, or the work in planting, cultivating and very little to the expense of harvesting.

Another potent cause of poor results is that of poor cows. And this point I wish to emphasize at this time. The results of carefully planned experiments as well as the experience of nearly every dairyman show that there are a large number of cows numbering perhaps 30 per cent with our average or common cows that do not respond to good feed and care sufficiently to pay expenses as milch cows. These cows are not only a drag to the dairyman but they are a hardship in that they make the good cows appear as though they also were not profitable animals.

These figures emphasize strongly the need of better cows, especially when we reflect that the average cow in the United States is producing less than 150 pounds of butter fat. All students of dairy husbandry recognize that if our dairy cattle are to be permanently improved it must come by good feeding and grading up with improved breeds that have had their dairy qualities fixed by long years of persistent breeding for dairy production.

By rising vote the Secretary was directed to send a telegram expressing the affection and great respect of the members of the association to Ex-Gov. W. D. Hoard.

Hon. A. W. Sanborn: I wish to speak in behalf of the farmers of this community and express our thanks to the Wisconsin Dairymen's Association for coming up here and holding this meeting for us. I feel, and I know they feel that you have done some good and we hope you will see some returns from this work.

A vote of thanks to the association was unanimously passed.

SECRETARY'S REPORT FOR 1912.

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 the period of adjournment of our convention at Beloit in November to the present time.

Convention expenses, Beloit		$368.86
H. C. Searles, Supt. Cow Testing Ass'ns, salary	$1,300.00	
Expenses	970.00	2,270.13
Creamery Package Mfg. Co., supplies		69.52
Postage stamps		40.00
Miscellaneous		6.54
W. D. Hoard Sons Co., printing		51.65
Secretary, salary	$250.00	
Office, expenses	33.76	283.76
Total expenses for 13 months		$3,090.46

Respectfully submitted,

A. J. GLOVER.

TREASURER'S REPORT FOR 1912.

Mr. President and Members of the Association:

The following itemized report is made showing the source from which all monies paid into the treasurer's hands were received and the disbursements made on orders from the secretary which I hold as vouchers.

1911				
Nov. 20.	Balance in hands of treasurer...	$440	31	
	Memberships	27	00	
Dec. 15.	From State Treasurer.....	1,000	00	
1912				
May 12.	From Secretary Glover, sale of books		90	
May 15.	From State Treasurer.....	1,000	00	
Nov. 21.	From State Treasurer.....	1,000	00	$3,468 21
	Disbursements.			
Nov. 23.	Wm. Kammer, convention expenses	5	87	
Nov. 23.	Waynes & Connony, convention expenses	5	00	
Nov. 23.	A. J. Glover, convention expenses	3	97	
Nov. 23.	C. P. Goodrich, convention expenses	1	87	
Nov. 23.	H. K. Loomis, convention expenses	110	26	
Nov. 23.	J. G. Westphal, convention expenses	2	20	
Nov. 23.	Frank Eddy, boys judging contest	15	00	
Nov. 23.	Robert Plumb, boys judging contest	10	00	
Nov. 23.	Henry Bird, boys judging contest	5	00	
Nov. 23.	Philip Bredson, boys judging contest	3	00	
Dec. 4.	H. C. Searles, November, salary and expenses	168	84	
Dec. 4.	F. W. Woll, convention expenses	3	22	
Dec. 4.	H. D. Griswold, convention expenses	9	28	
Dec. 4.	E. G. Hastings, convention expenses	3	00	
1912				
Jan. 4.	H. C. Searles, December, salary and expenses	164	04	
Jan. 22.	Mrs. A. L. Kelly, reporting convention	124	00	
Feb. 2.	H. C. Searles, January, salary and expenses	175	28	
Feb. 12.	A. J. Glover, stamps	40	00	
Feb. 12.	Harold Alrich, conducting	7	50	

Feb. 12.	Creamery Package Mfg. Co., supplies	4 22	
Feb. 27.	William Essmann, freight and express	5 39	
Mar. 5.	H. C. Searles, February, salary and expenses	183 80	
Mar. 5.	Jenkin Lloyd Jones, services rendered	50 00	
Apr. 3.	H. C. Searles, March, salary and expenses	172 11	
Apr. 17.	W. H. Clark, convention expenses	6 69	
Apr. 17.	Creamery Package Mfg. supplies	2 55	
Apr. 17.	Creamery Package Mfg. Co., supplies	7 05	
May 3.	H. C. Searles, April, salary and expenses	169 68	
May 3.	Creamery Package Mfg. Co., supplies	8 85	
June 4.	H. C. Searles, May, salary and expenses	173 45	
July 4.	H. C. Searles, June, salary and expenses	181 60	
July 4.	Creamery Package Mfg. Co., supplies	2 60	
Aug. 3.	H. C. Searles, July, salary and expenses	167 41	
Sept. 6.	H. C. Searles, August, salary and expenses	174 37	
Sept. 6.	Creamery Package Mfg. Co., supplies	8 61	
Oct. 3.	H. C. Searles, September, salary and expenses	175 01	
Oct. 3.	Creamery Package Mfg. Co., supplies	12 35	
Nov. 5.	H. C. Searles, October, salary and expenses	185 13	
Dec. 3.	Creamery Package Mfg. Co., supplies	23 29	
Dec. 3.	H. C. Searles, November, salary and expenses	179 41	
Dec. 3.	W. D. Hoard Sons Co., printing	51 65	
Dec. 21.	H. K. Loomis, postage stamps and exchange on draft	1 15	
Dec. 21.	A. D. De Land, expenses, Neenah convention	3 00	
Dec. 21.	A. J. Glover, salary and office expenses	283 76	
Dec. 21.	Balance in hands of treasurer	377 75	$3,468 21

H. K. LOOMIS.

FOURTH BIENNIAL REPORT

OF

State Board of Immigration

J. S. DONALD, CHAIRMAN
Secretary of State

H. L. RUSSELL,
Dean, College of Agriculture

O. G. REWEY,
President, State Board of Agriculture

B. G. PACKER,
Commissioner of Immigration

MADISON, WIS.
1914

REPORT OF STATE BOARD OF IMMIGRATION

Madison, Wisconsin, January 7, 1915.

TO THE LEGISLATURE OF THE STATE OF WISCONSIN:

No state gives so much personal service to the intending settler as does Wisconsin. No state makes the questions he asks, which are so all-important to the land seeker, a matter of personal concern, not only through the office of the Commissioner, but in all of the various coöperating branches of agricultural service in the state.

It is difficult to estimate the value of a new settler who comes into the state and purchases land for the development of a home and the means of a livelihood. It has been estimated by governmental authority that on the average such a settler is an asset that is worth at least a thousand dollars to the state. Not only does he purchase and pay for the land which he owns, but what is of more significance, he starts a home and spends a large portion of his energy in redeeming what is now unused and unoccupied land, making it a source of productive income to himself and family. In this capacity he becomes a revenue producer and his returns are spent in large measure for the sustenance of himself and family.

Likewise as a taxpayer he bears his share in the cost of government and so the state receives a direct benefit from the taxes which he pays, as well as an indirect benefit which comes from the expenditure of his earnings for the support of his family. The man who has hewed out a home for himself in the cut-over woods of the North, or has broken and put under cultivation a farm, may well be said to have done his duty to posterity and deserves to be well treated by the state.

The State Board of Immigration herewith submits the report of the Immigration Commissioner with reference to the work of

the Board during the past biennium. In summarizing the work of Commissioner Packer it is impossible to detail all evidence of the real and the total value of the work which has been performed during this period, but he is able to point to tangible results of a very definite character.

The legislature willingly granted two years ago an increase in the funds of the Board because they saw that results were being secured which then indicated that moneys were being wisely utilized. The Board believes that the work under way can be rendered of much greater value in the next biennium by a moderate increase in the funds that may be placed at its disposal. It believes that this expenditure can be made an investment for the state which will net most excellent returns for the money spent. Never was there a more propitious time at hand than now to push actively the opportunity for the development of the state.

J. S. DONALD, *Chairman,*
Secretary of State.
H. L. RUSSEL,
Dean College of Agriculture,
O. G. REWEY,
President State Board of Agriculture.

COMMISSIONER'S REPORT

To the State Board of Immigration.

Gentlemen:—If it were possible to incorporate into a report limited in length by statute, a digest of what the great body of homeseekers in touch with us wish to know, and what we are doing to help them, this would be no dry dusty document but one brimful of human interest. For no department of state deals with matters more closely related to home life. His attention once obtained and assured that the Board is impartial and not financially interested in the sale of lands, the inquirer proceeds to unfold in detail his present intentions and plans for further activity, in so doing hoping he may be saved from misdirected effort. Encouraged to believe that his welfare is the chief consideration of the department, and his making good at farm development a greater item than mere purchase of lands or removal from another state to Wisconsin—and such is the manner in which this work always has been conducted—a close personal relationship follows and he comes back with three and four pages to learn more about every phase of the situation.

Homeseekers appreciate this information and our facilities for supplying it should be multiplied. For such appreciation finds expression in definite action. In support of this the following brief extracts from letters endorsing the state are presented from some who have been given direct, personal assistance by the department in purchasing and locating.

F. A. H.—"I received another letter from you and you asked me to visit Wisconsin. I did and I liked it so well that I bought 179 acres, lying right along the St. Croix river. Have about 60 acres of good hardwood timber on the river and the rest is all good level land. I have rented some other land so I have in my control at present 640 acres. I have about 100 acres in crops, about 35 acres of corn. I sowed some red clover and alfalfa. I want to see what will do the best here. Everything looks nice now and pasture is good. Have 8 head of horses, six head of cattle and 15 hogs."

W. S.—"We bought 1500 acres near Benoit and had a carload of wire shipped there with which to fence in this land. We expect to sow clover and timothy seed and later buy sheep."

W. F. C.—"In reply to the within I have already taken your advice and have removed to above address, Foxboro."

W. A.—"I am glad to hear from you at all times in regard to Wisconsin. I have 160 acres between Hawkins and Ingram. I bought the land by reading the advertisements which you sent out. I am well pleased with Wisconsin. I gave all papers and advertising matter to my friends, and I know of two farmers that went to Ladysmith through the papers they got from me. They are doing well so you see all the writing you have done to me is not a loss. I intend to locate."

E. P.—"Your favors of the 16th and 22nd inst. have been duly received.

We have bought 280 acres of land two miles directly east of Glidden, have cleared 25 acres and seeded them all down with crops this spring.

We are very enthusiastic over our new undertaking."

F. N.—"I have bought 160 acres in Pepin county. This locality is one of the chunks of the original Paradise which broke off at the time of the flood and lodged here when the water went down."

H. D.—"Received your letter yesterday. I bought eighty acres in Juneau county in a German Township. You can now address me at New Lisbon."

J. S. F.—"I have purchased a farm of 328 acres of land in Sawyer County and expect to soon move upon it with the intention of making Wisconsin my future home.

After visiting your state I am convinced of the eminent possibilities for making good in Wisconsin and I feel safe in making this venture."

G. K. G.—"Many thanks for the kind and valuable information your department has furnished me. I have purchased eighty acres in Marinette County and expect to move there within the next year. I am located four miles east of Middle Inlet.

Any further information you may give me will be appreciated and also used in getting settlers in Wisconsin."

R. L. S.—"I have located in Douglas County. Will you please send what literature you have that you think would help convince a person that this is a desirable place to live? Send stuff that would convince a woman! As you know the farm is no place for a man when single."

H. C. A.—"I have just bought a tract of 40 acres near Rib Lake. in Taylor County. The land is uncleared. It is our intention to move there this fall, erect a house and stable, etc., clear such land as we can and start farming in the spring of 1915."

E. C. S.—"I am in receipt of your letter of May 13th addressed to me at Ft. Morgan, Colorado, although I am no longer in Colorado. I wish to thank you for the interest you are taking to try to induce settlers to come to our state and take advantage of the many opportunities of which our state offers, in the line of good cheap land.

While in Colorado I met and saw a great many people who were having a hard struggle to make a living or as you might say living from hand to mouth, and a great many of them are good people who would make good citizens, and who would if they could only be induced to come here and settle, soon have good comfortable homes with plenty to eat. My object in writing you last year was to get reliable information so as to try and convince people out there that our state was not one of ice and snow, as a good many think it is, but a state which produces good crops and plenty to eat for every one who is willing to work."

E. J. W.—"Both of your letters of recent date sent to my old address,—Easton, Illinois, have been forwarded to me at my present address,—Thorp, Wisconsin.

I have purchased a farm 5½ miles south of Thorp, in Clark County and am now located on it trying what can be done.

I should be glad to be placed in touch with the coöperative associations, etc., of which you speak in your letter of the 26th instant, especially live stock breeding, alfalfa, and potatoes."

A. O.—"I bought 80 acres of land this month in Oneida County. Can you give me some further information in regard to the soil and the county herein mentioned?"

L. D. E.—"I have bought land in Polk County and will get my mail through the Centuria post office after tomorrow."

V. S.—"I wish to let you know that I was in Wisconsin and bought 40 acres of land in Wood County, 11 miles from Marshfield. Please let me know what is the best thing to raise there. I would also like to know where I could get plans for buildings. I expect to start farming next year early in the spring."

A. M. T.—"Since making inquiry of your department I have purchased a farm two miles south of Medford. Kindly furnish information concerning varieties of corn best adapted to this section, also how to prepare the soil and cultivate crops, and whether vetch is good for stock. What about alfalfa for this section?"

W. Z.—"I received your letters and your maps but I did not have time to answer because I was traveling picking out farms. Please send the book and other information as the address is given below. I left Illinois the first of April, and now my address is Thorp, Wisconsin."

H. E. A.—"Wish to inform you that my brother who wrote you has bought a farm about ten miles from Turtle Lake, Wisconsin. He moved on his place April 1st."

G. M. P.—"Am already in Wisconsin and have purchased the land I was interested in near Superior."

L. A. H.—"You should write me at Cushing, Wisconsin, instead of New Hartford, Iowa.

I have bought another farm. So we have two farms in Polk county. I also sold another farm of 120 acres just 1½ miles from here to another man from Iowa. He is also living here now."

A. H. M.—"During last January I wrote this department from Regina, Saskatchewan, about the land conditions in Wisconsin. Some few days ago I went over into Wisconsin and found what I was looking for. I have been a prairie farmer for some years but wish to get back to the water and timber where crops are certain. I wish the department would please mail me any information on truck culture that you have on hand."

E. S. G.—"Received directory of Douglas county. We had some correspondence with you from Faith, S. Dakota. We are now at Solon Springs."

W. D.—"I received all your letters written this year and last year and I am not in Kansas any more. I have been in Wisconsin for 9 months. I like it fine and I am sorry that I stayed so long in Kansas, the land of hot winds, little rain and chinch bugs. People who come from those dry prairie states like Nebraska and Kansas and Oklahoma are bound to be pleased with this country, as it is so much better here in every way. I left Kansas last summer after we had a spell of dry weather that lasted for four months, from the first of May until the first of September. Everything in the line of vegetation was dead and chinch bugs besides, and when I got into Illinois and Wisconsin I thought that I had left a desert and gotten into Paradise. If you are anxious to get more settlers into this state, I wish you would send some descriptive matter to the following persons: . . . I am sure these people do not know how much better it is in this country or they would not be where they are now."

I. S. M.—"Your letter came to hand to-day and am pleased to say I am in the state and have been ever since November 5th last, in Washburn county."

J. O. E.—"I have adopted Wisconsin and start this spring to develop a farm in Vilas county. I would like any information and literature you may have on live stock—what dairy cow is best for that section?"

R. G., L. K.—"We have been in Merrill for five days now and have been traveling every day looking over farm land and will say it is just as good as you have represented it to us. Mr. Leo Kronek and myself are each negotiating a deal for a good farm. I am sure when we get back to Kansas there will be others coming here, after we move."

E. T.—"I have purchased 200 acres of land in Washburn county, and intend to farm it this year. The soil is sandy mixed with some clay. I would like to know if barley or flax would do well on this land for the first breaking. Please tell me what grains would do best and also send some soil bulletins."

T. S. D.—"Medford is my future home. Expect to settle there for good in the not distant future. Purchased a nice piece of land ten miles west of town last fall."

P. M.—"I am letting you know that I moved to Deerbrook, Wisconsin, where I bought 80 acres of good land. It is cut-over land and I will appreciate any advice about clearing this land."

C. J.—"In reply to your last letter I am writing to let you know that I have made two trips to Wisconsin and have selected a piece of land near Park Falls in Price county. Now, I would be very much obliged to you if you would write me concerning the best and cheapest way of removing stumps and the crops best adapted to that soil."

A. W. A.—"I received your letter of June 3rd this morning. As you see I am now in Wisconsin. We are about 4½ miles southwest of Veedum. If you have any advice for greenhorns, I will appreciate it."

W. T. L.—"I have been in Waupaca county since October last."

A. H.—"I received your letters and wish to say that I have already bought 60 acres of land for a farm near Antigo, Wisconsin."

R. A.—"Mr. Axel Anderson is already living in Wisconsin. He has eighty acres near Amberg. Has been there about two months."

L. M. B.—"We arrived here April 23rd and spent a week looking for a farm that would suit us and our means to do with. On April 30th we purchased a partly developed forty acres one and one-half miles north of Kennan."

C. J.—"I have purchased a tract of land in Vilas county near Eagle River. I can say for Wisconsin land, there is none better, nor any better place to live. Northern Wisconsin is coming to the front and will be a great agricultural country. I have been on the plains, but I find the wooded lands the best. I have lots of friends in Kansas whom I think would like some of your letters. And if you wish those names, I will send them."

J. W. N.—"I have 40 acres located in Langlade county nine miles northwest from the city of Antigo and any information that I can receive from the experiment stations will be appreciated."

M. A. R.—"Acting on your advice I have bought some land in Douglas county, Wisconsin, and have put a family on the land to prepare it for dairying and stock raising. If you will have sent to my address any information you may possess on the following subjects, I will greatly appreciate it: (1) The best methods of clearing. (2) Dairying and dairy cattle. (3) Sheep. (4) Beef cattle on cut-over lands."

L. C. M.—"Since making inquiry through your department. we have purchased 320 acres in Price county. We wish to develop this land, but may not be able to move for a year or more.

I would like to develop this land along the lines of cattle feeding, growing alfalfa to carry the cattle through the winter, and yielding fine pasture land for them to run on during the summer."

G. M. S.—"I wish to state that I have purchased land here and am making it my home. Am more than pleased with my investment. Have found opportunities even better than represented. Am sending you my father's address whom I believe will become interested in this country."

J. F. A.—"There are five of us each buying eighty acres. The land is located in the northeastern part of Polk county. We are all going in the stock and dairy business. There are four more parties going to look at the land where we bought, and I am doing all I can to get them there. The more the merrier."

A. C. B.—"I have visited Wisconsin twice and picked up a piece of ground 8 miles north of Chippewa Falls on Eagle Prairie so you see I realize that I want to live there."

A. B.—"I have been up in Wisconsin and bought some land in the Cutler Drainage District. Some of that marsh land right along that big ditch."

W. D.—"I have bought some cut-over land in Wisconsin. I would like to know what help you give to the settler. I have read about the credit system in the paper and would like to find out about this."

E. R. E.—"I bought a farm about five miles from Trego. Am more than pleased with Wisconsin."

G. F. F.—"My 'sentence' to the sheriff's office will expire in 1916. Will then locate in Clark county."

E. L. I.—"I moved to my eighty acre farm seven miles from Cumberland in the early spring. I have a small piece now under cultivation but not nearly as much as I expected to have the first season. The land is all right; in fact, it is very productive."

W. O. S.—"Have bought 80 acres at Brule, Wisconsin, and expect to clear part of it soon."

L. K. S.—"We moved on our farm at Frederic, Wisconsin, and intend to start improving the land and do some farming this year. I wish you would kindly send us any late bulletins that have been issued and kindly have my name put on the list. I would like to get a bulletin on barn ventilation."

E. A. S.—"I have 160 acres of brush land that could be quite easily cleared."

D. J. S.—"I came to Wisconsin and bought land and moved here to Ladysmith."

C. N. D.—"I have purchased land in Bayfield county near Washburn, and expect to move there with my family next spring. For dairying, fruit raising, etc., I believe there are wonderful possibilities in that district."

I. V. D.—"We have purchased one hundred and sixty acres of land in the Bayfield Peninsula. It has five acres cleared, planted to apple trees, four years ago."

C. G. C.—"I have bought seven hundred and sixty acres of land near Cayuga. Myself and two sons arrived on July 4th. We have quite a clearing, considering the fact that we have had to build a set of buildings. We hope ultimately to make this a stock farm and any suggestion along these lines will be gladly received."

B. C.—"I am now located in Wisconsin on my farm at Barronett, and wish to thank you for all the information you furnished me and now wish you would see that I get some of the circulars and bulletins published by the State School of Agriculture in regard to corn, potatoes, alfalfa and garden produce."

G. P. F.—"Some time ago I wrote you that I had purchased some land in Taylor county, and wish I had the means to take more."

W. R. F.—"Have investigated your state and bought 120 acres near

Humbird, with the intention of making it my home. Do my horses and cattle have to be inspected? My farm is in Jackson county."

P. G.—"I have bought a farm in Wisconsin and expect to move there in the fall."

T. G.—"I am here in Wisconsin near Mauston, and have been here for four months and do really think Wisconsin is good."

D. R. H.—"I have purchased 320 acres of land in Jackson county. Will be glad to hear of the best way of getting such soil under cultivation to yield an income."

J. M. G.—"I am pleased to say that after two weeks stay in Wisconsin I have purchased land in Chippewa county, where I expect to settle in the near future."

L. G.—"I have bought a nice farm in Wood county, and like it very much up here."

G. E. H.—"I will purchase a farm in Wisconsin this month, probably in Polk county. We propose keeping about seven good cows this fall and winter. Could you help me in getting pure or near-pure bred Guernsey cattle?"

N. H.—"On account of your information I finally decided to buy land in Douglas county. I would appreciate it if you would place me on your mailing list and keep me posted on matters of agriculture, horticulture, and fishing, etc., issued by the state."

J. H. H.—"I will tell you that I have had the pleasure of visiting Sawyer county. I have bought 280 acres. I have done a little clearing and broke a few acres. I am highly pleased with my proposition."

H. H.—"In reply to yours will say I left Dubuque, Iowa, and am now settled in Wood county, Wisconsin."

A. H.—"Last month I was in Vernon county, Wisconsin, and bought a 102 acre farm."

J. F. H.—"Replying to the attached, beg to advise that I bought a farm in Taylor county last May, and will say that I am well pleased with my purchase."

W. H.—"My brother and myself intend to locate in Adams county about the 15th of April. We are going to engage in poultry farming for this season until we get our bearings."

E. H.—"We now own 40 acres of land in Wisconsin near Tomah and would like to know about having our cows and horses examined as we intend to move there in October."

O. O. I.—"Since writing you last I have bought a farm in Marathon county, and now I am trying to get my friends interested. I am writing you for literature which may assist me in doing this."

H. C. C.—"I have purchased 120 acres in Clark county and any further information will be thankfully received."

C. H. F.—"I have purchased a piece of land in St. Croix county."

C. W. J.—"I was up there last fall and like it fine. I expect to make my home in Wisconsin soon, as I purchased some cut-over land in Marinette county."

F. W. K.—"Wish to thank you for the interest you have taken in me and the questions I have asked you from time to time. For your information will say that I together with several other parties from this section have purchased land near Bruce, Wisconsin, and we are very much pleased with same."

A. K.—"In regard to Bayfield county lands will say that I purchased 40 acres."

G. K.—"I have been riding in Wisconsin quite a bit and I found a place, just seven miles from Mauston."

A. K.—"What will a car of emigrant movables cost from Clear Brook, Minnesota, to Rice Lake, Wisconsin, over the Soo line? Please let me hear from you immediately as I intend to ship soon."

N. S. K.—"I have bought a piece of land in Taylor county and I want to come down there to live. Please let me know what that country is good for. What crops can be raised there, etc.? How is that yellow clay soil for lasting?"

A. G. L.—"Am negotiating now for a place at Lake Nebagamon, Wisconsin."

W. O. L.—"I have bought a tract of land near Solon Springs, Wisconsin. I think the opportunities there are good."

F. C. L.—"I am about ready to move to Wisconsin and intend to take some horses and cattle with me."

E. F. M.—"I have purchased some land in Burnett county, Wisconsin."

G. E. M.—"I am very much interested in Wisconsin land, as I have purchased a farm of 40 acres in Sawyer county. I ask your advice as to what you consider the best crop, that is the one most suitable for the land around Hayward."

C. A. N.—"I have been here since March 25th. We like it here (Columbia) pretty well although the weather has been rather against us this year in this section of the state."

B. L. P.—"I wish to advise you that I have bought 160 acres in Rusk county and expect to open up next year.

A. F. P.—"I wish to inform you that I purchased land in Wisconsin last June."

H. F. P.—I am located in Marinette county. Came in June and like the country and climate fine."

J. P.—"I am letting you know I have bought a farm in Langlade county."

D. C. P.—"I have 325 acres near Augusta. I had a fine log house built on it and stable. Sowed 26 bushels of grass seed on it and it grew well. I bought a car of yearling steers and shipped them out there."

R. D. R.—"I made an inspection trip through your state purchasing 80 acres in Langlade county, Wisconsin. I am planning to have same made ready and put into cultivation."

V. R.—"Well, sir, I bought 40 acres in Rusk county, and it looks good to me."

F. W.—"I will be a Wisconsin citizen soon. I have bought 160 acres in Clark county."

L. P.—"I have purchased a farm in the southern part of Langlade county. I would be pleased to receive any information you can give in regard to that section."

W. U.—"I have purchased a quarter section in Marathon county."

D. S.—"I made a visit to your country last August and was very much pleased with it, so much so that I purchased a piece of land."

F. W.—"I talked with you about Wisconsin at the North Iowa Fair at Mason City, August 19th. I bought an 80 acre piece of cut-over land in Barron county."

J. E. B.—"I am now living in Wisconsin and if at any time I desire any information from your office I shall not forget your kind offer of assistance."

A. T. B.—"Since writing you last I purchased a farm of 80 acres in Price county, and if nothing unforseen happens will go up next spring."

W. F. B.—"I visited Bayfield county in June of this year, and purchased 80 acres of land. I am very much pleased with what I saw of Wisconsin."

W. P. B.—"I have visited northeastern Wisconsin four times in the last year and bought 160 acres in Marinette county. I think the country is all O. K."

J. J. B.—"I was down at Stanley last spring and bought a nice 80 acre farm and am well pleased with the country."

C. B. B.—"We have bargained for a quarter section in western Marathon county which I believe to be a good piece of land."

C. E. C.—"I am not only convinced that Wisconsin is a great state, but I am the possessor of a 120 acre farm near the town of Medford here. I shall refer prospective settlers to your aid."

H. L. R.—"I bought 360 acres near Amberg, Wisconsin, and am well pleased with my purchase. I cleared eight acres and will clear some forty acres more this fall if nothing prevents. I will move on it as soon as I have enough in condition to farm properly."

L. K. S.—"I have just bought 160 acres in Bayfield county."

C. W. S.—"I have now 800 acres of land near Marshfield, which is all right for a starter."

D. S.—"I have already bought 80 acres of land in Taylor county, Wisconsin. It is all level and black soil, partly improved, 30 acres cleared. I expect to move in the spring. I expect to raise cattle and some hogs up there."

W. J. O.—"Located, thanks for further information and success."

F. E. M.—I have bought 320 acres of land in Wood county."

F. C. L.—"Your communication of some date ago was mislaid and has just come to light, and hasten to answer that I am now located at Stoughton."

S. M.—"I bought 83 acres in Juneau county."

M. L. M.—"I bought an 80 acre farm up in Marinette county. Am very much pleased with the country and think it has a great future."

O. J. M.—"Two families, friends of mine, bought land at Sister Bay. I showed them the literature you sent me last spring and they went at once and bought."

J. H. M.—"I have bought land in Clark county, Wisconsin, and expect to move there soon. I think we will engage in dairying."

J. E. M.—"I wish to inform you that I have located in Washburn county."

G. B. M.—"I am settled in the northern part of Taylor county and am well satisfied."

L. M.—"I am happy to inform you that I have purchased 120 acres in Wood county."

L. E. B.—"Will say my wife and I were in Wisconsin May first last, and have bought 160 acres. We intend to move there and carve out a home. One thing makes me feel good and hopeful for that country is that clover does well there."

D. R. B.—"I have purchased land in Taylor county. I am packing my things now and expect to leave Springfield about the 20th for Withee. I find Wisconsin to be a state of great opportunities and I am very much obliged to you for the information you gave me."

B. C.—"I am now located in Wisconsin, at Barronett."

C. N. D.—"I have purchased land in Bayfield county, near Washburn."

H. K.—"I bought some land in Wisconsin and would like the map of Barron county."

F. S. W.—"Yours received and in regard to buying land will say that I bought 80 acres in Price county.

A. B. W.—"Shortly after I wrote you, I purchased a quarter section of land in Washburn county and hope to either develop it myself or get some one on it who will do so before long."

A. T. S.—"I bought forty acres of land four and one-half miles from Cumberland."

J. T.—"I was through some parts of Wisconsin last fall and bought 40 acres of land in Oconto county."

A. W. W.—I have bought an uncultivated farm in Sawyer county, and would be greatly obliged for any information in regard to what crops would be advisable to plant the first year."

These are only short extracts and space forbids a more lengthy statement from others who have received assistance in purchasing, but to show the interest a single illustration will suffice: Of 3,856 receiving our entire series of follow-up, covering a period of several months, 190 reported purchasing, 77 picked out particular counties for further investigation, 28 had visited the state but not yet found just what was wanted and 203 were still interested. Only a partial check is possible for not all who locate inform us of their removal to the state and not all who purchase are able at once to begin development, but the above percentage will hold good with the 10,800 we are following.

Organization of the Work.

The budget covering the work embraces separate amounts for purposes of administeration, classified advertising, publications, exhibits and lectures.

We do not place inquirers in touch with owners of or dealers in land—only a few request it—for homeseekers are not inquiring so much "from whom shall I purchase" as about crop possibilities. The work develops more and more into a clearing house of information, and time, research and patience are necessary to furnish promptly and as completely as possible data about which the inquirer may be concerned, embracing in addition to the publications issued by this board much special material from the college of agriculture, geological survey, and from state and local organizations whose activities are connected with dairying, the production of field crops, live stock and fruits. To include in one volume the information sought would be impossible. For those writing are usually interested in certain soil types and specific subjects more fully covered by personal correspondence and separate publications. And of the thirty per cent who continue communicating the majority have a definite idea of the branch of farming to be undertaken. Four stenographers are employed and more are needed.

Administration.

On matters relating to immigration all the states are competitive. And to establish a system productive of results requires an understanding of what each is doing along similar lines, for many in touch with us also are seeking information from other states. Such data have been difficult to secure but we now possess a complete library showing precisely the method

by which other states conduct their activities in stimulating immigration; this material having been gathered first in 1911 and kept down to date. It is rather interesting to learn that the manner in which some of these states handle their inquiries has, unknown to them, been of direct assistance in pointing immigration toward Wisconsin. And while spending considerable sums of money to obtain the attention of homeseekers, very little has been done by state departments in following up the requests so obtained. In its administration the efforts of this department may be outlined as follows:

1. To secure the attention of those looking for homes.
2. To arouse an interest in the state.
3. To create a desire to locate.
4. The actual promotion of immigration.

Classified Advertising.

Direct, traceable returns are secured from classified advertising. During the past year the following card has been inserted in the classified columns of a limited number of farm journals, country newspapers, and metropolitan dailies:

> "For Official Publications concerning the soil, climate and crops of Wisconsin write the State Board of Immigration, Madison, Wisconsin."

Each notice is keyed to indicate the paper giving results. Journals have been used whose circulation covers the central states, the most profitable field, and this method is very effective in securing the homeseeker's attention. The possibilities of such advertising are limited only by the number of newspapers that exist. More should be used. It is the most modern way of getting in touch with those whose efforts will contribute toward development and one given almost unlimited use by the Canadian government. It can be made to cover any section, any state or the entire country and do it thoroughly. In short, it is efficient, rapid and valuable because it enables the state to secure attention instantly and get returns immediately.

How the State Helps.

To continue the interest of those responding to such classified notices a comprehensive system of follow-up is employed in the form of personal communications, as hereinafter discussed.

No proper presentation of Wisconsin's offering to the homeseeker can effectively be made without appreciating agricultural surroundings in sections whence the homeseeker is writing. To

assemble such information and to use it with profit has meant an analysis of federal reports describing agricultural conditions in every county in every state in the Union. This comprises the production of all crops per acre, the percentage of farm tenancy, increase or decrease in farms or improved land, and in farm property values including live stock, farm buildings, and the average worth of crops per acre. For inquirers determine values to a great extent by comparison and the department is constantly furnishing these statistics of crop production in Wisconsin counties and others throughout the United States.

And we have tried to avoid appealing to the imagination of homeseekers by refraining from publishing rosy stories showing unusual successes of Wisconsin farmers. While there are plenty of such illustrations showing what has been made in a single season, their widespread publication is unsafe even on the theory "what one man has done another can accomplish" because so far as obtaining results in the field are concerned, it has not yet been established that all men are equally competent. It is much safer to use averages and such comparisons are valuable: First, because they are impartial reports of the federal government; second, they are averages; third, they are as complete as can be expected; fourth, they convince. To illustrate: In response to an inquiry received from one residing in Illinois asking about a particular Wisconsin county, a personal letter is prepared showing first the yield per acre of cereal crops, hay and forage, and potatoes in the county where the prospect resides. A similar table is also presented showing the production of the Wisconsin county in which the inquirer has expressed an interest. The increase in farm property values is compared and further information furnished showing the total production of crops and their acreage, the rainfall and its distribution and the length of growing season; a short description of soil, number of rural free delivery routes, newspapers, telephone lines, public and private schools, and especially such recent seasonable data as are available. Every effort is made to persuade the inquirer that the department takes a definite interest in his undertaking.

In addition to a personal letter the inquirer writing the department receives a soil survey of the area in which he is interested—if one is published—with the statement that such is only a *general* survey—a bulletin devoted to climate, map, and additional publications discussing problems of interest to him.

The first letters received from homeseekers are less difficult to handle than their subsequent inquiries, yet those principles applicable to all business enterprises are applicable to the work of this department, and no successful commercial organization today would delay in following up the first response from advertising. It simply must do so to live. A single communication from this state however complete will not bring the traceable results desired, and it cannot be emphasized too strongly that there must be a further presentation to increase the interest expressed, to create a desire to locate, and to actually promote location. Hence, each inquirer receives five letters from this department whether he replies or not, and also six additional communications prepared in and sent out by our department in coöperation with the State Experiment Station, State Board of Health, Library Commission, Live Stock Breeders' Association, and the State Horticultural Society.

Coöperation With Experiment Stations.

The branch experiment stations throughout the state are fully informed about profitable methods of crop production and possess information of great value to those contemplating a removal to this state. And that period covering the opening up and development of the first ten acres is the most crucial in our new settler's entire experience. To Professor E. J. Delwiche, Superintendent in charge of the Branch Experiment Station work, and to county agricultural representatives belongs much credit for assisting those who locate and others who intend to do so, in outlining methods of opening up new land to secure as early a return as possible. To each homeseeker the department sends a personal letter calling attention to the assistance rendered by these branch experiment stations, and every opportunity is afforded to become acquainted with the latest and best being accomplished in land cultivation throughout the state. It is admittedly impossible for us to pass on matters relating to farm practice, but such problems are inseparably interwoven with immigration. The state through its College of Agriculture, however, possesses this information, and it is our duty to see that the homeseeker receives it at once.

Those in touch with the department are thus made to feel that the state takes a personal interest in their making good. No other state immigration department coöperates in this manner with experiment stations. To digress right here for just a mo-

ment: the Canadian government has transferred its immigration activities from the older sections of Wisconsin to the new portions. Their representative travels from town to town, placing bulletins in the settler's wagon while he is buying supplies for the house, and by other methods is urging him to cease his efforts at development in this state and trek to the Canadian frontier. The following from last year's report of the Canadian government agent for Wisconsin to the Canadian Superintendent of Immigration at Ottawa is suggestive:

"In the southern or older parts of Wisconsin I find less desire than formerly among the farmers to move west. This is accounted for by the fact that dairying, which is the chief business of this district, has been very profitable for the last two or three years and is getting better every year."

Again:

"The people from the northern part of the state will make first-class settlers for Canada, being energetic, resourceful and capable and having sufficient outfit and money to make a good start."

Yet in view of actual possibilities the dairy industry is really only nicely started. There is much good country still to be opened and I mention the work of the Canadian government at this point merely to show how advantageous it is that new settlers become acquainted with methods of development that will permit a rapid expansion of the farm.

Coöperation With the Geological and Natural History Survey.

The department is deeply indebted to the State Geological and Natural History Survey for descriptions of soil types and a generous supply of soil bulletins. Charged with the work of preparing this survey, it has assumed an active interest in settlement by contributing freely printed matter indispensable to an effective administration of our work, and such impartial reports have greatly assisted in riveting the homeseeker's attention on Wisconsin. For the first step is to induce folks to come and see for themselves—and all are advised that it is unsafe to purchase homes on the strength of any soil map—and to accomplish this purpose the reports of the survey have proven effective. Those receiving copies often loan them to neighbors and ask for more. Such reports are impartial. They show general types with reasonable accuracy. And better still, these bulletins are written in plain language. On this matter of soil reports, Wisconsin possesses a unique advantage over most states compet-

ing for immigration for few have accomplished much in survey work. This field of activity is one of great value to Wisconsin, and such reports need not necessarily be in detail to serve a high purpose so far as inviting settlement is concerned. Much of the state has been covered, and it is important that additional data gathered be reduced to map form as early as careful preparation will allow. Such maps are available for distribution, covering the counties of La Crosse, and parts of Monroe and Vernon, also Portage, Juneau, Waushara, Racine, Iowa, Marinette, and parts of Rock and Dane; Taylor, Clark, Wood, Marathon, Lincoln, and parts of Langlade and Price; Douglas, Bayfield, Burnett, Sawyer, Ashland, Polk, Barron, Rusk, St. Croix, Dunn, Chippewa, Pierce, Pepin and Eau Claire.

Access is now had to field notes describing other portions of the state, and when information is sought about particular townships not mapped, we are usually able to furnish something definite to those whose attention has been turned in that direction.

Additional Coöperative Methods.

It is the experience of those whom the department has assisted that the helpfulness of our work is much increased by further coöperation with the Board of Health, Free Library Commission, State Horticultural Society, and Live Stock Breeders' Association. The activities of these organizations are of interest to homeseekers—their work is in close contact with home life—and all nonresident inquirers receive personal communications outlining in full their efforts and how they can be of assistance to new settlers.

The Board of Health shows by comparison that Wisconsin has a low death rate from typhoid fever especially in rural sections, as compared with other states and that the death rate from tuberculosis is also lower; the Free Library Commission calls attention to what is being done in furnishing traveling libraries to groups of families, suggesting when the prospect locate that he interest himself in securing one for his own community; the Horticultural Society summarizes the fruit situation, naming varieties of apples, plums and cherries adapted to various parts of the state, describing opportunities for the production of small fruits and inviting further coöperation when the inquirer has established himself on the land. Similarly, the Live Stock Stock Breeders' Association shows what is being done by community breeders' societies in helping stockmen of the respective

counties in improving their herds and flocks, in purchase of breeding stock and cow testing activities. Such information takes the form of personal letters which are prepared on stationery furnished by those organizations but written and sent out by our department. This coöperation has brought results. And such results are becoming more and more manifest.

Publications.

From December 31, 1912 to December 31, 1914 the following printed matter has been published by the department:

"Making Good on New Soil"	**35,000**	**copies**
"Wisconsin the Great Dairy State"	**15,000**	"
"Wisconsin Opportunities"	**45,000**	"
Bulletin No. 196	**40,000**	"
Posters & Leaflets, "Wisconsin Compared"	**55,000**	"
Maps	**35,000**	"

During this period there also have been distributed four thousand copies of the soil survey covering north-central Wisconsin, three thousand five hundred of the survey of northwestern Wisconsin, and hundreds of soil reports describing separate counties; five thousand copies of a special bulletin issued by the college of agriculture, entitled, "The Climate of Wisconsin and Its Relation to Agriculture"; twenty-five hundred Farmers' Institute bulletins; twenty-five hundred copies "Commercial Potato Growing in Wisconsin; and, hundreds of other special bulletins relating to subjects about which homeseekers are inquiring.

Agricultural Exhibits.

No feature of this work is more potent in inviting settlement than the placing of exhibits of Wisconsin farm crops in those areas most interested in what our state has to offer homeseekers. Such expressions of visitors as: "I thought Wisconsin too far north to grow corn," "Were those crops produced without irrigation?", "Were they grown this year?", and similar remarks are commonly heard and indicate a widespread opinion among farmers of Illinois, Iowa and Indiana that Wisconsin is too far north for profitable crop production and especially corn. Now, to the reader this may appear to be rather a strong statement, but that it is true is the experience of those who have put on such displays. Development has been retarded by this impression, for the printed page alone does not always convince. And the field of endeavor most productive of results in this activity includes the states mentioned and Nebraska and Kansas. As a force for creating sentiment in favor of Wisconsin no better

medium could be found. Exhibits make more effective all other efforts of the department. Personal contact is had with farm tenants and others searching for new locations, opportunity is afforded for impartial discussion of subjects connected with their removal to this state, and one cannot portray the interest in any better manner than to say that hundreds of those with whom such conferences are had, show further desire to learn by registering for additional printed matter describing the state.

"After my visit with you at the Illinois State Fair in Springfield last summer I went up to Park Falls, Price county, Wisconsin, and purchased 200 acres of cut-over and fire burned over land on which the remaining trees are killed. I would like to have my name placed on the State Experimental Station mailing list for bulletins relative to the clearing of this kind of land, also on seeds best adapted to growing grasses, hay, small grains of all kinds, corn, small fruits and fruit trees."

Still, the labor connected with making an exhibit is not finished when the display has been removed to another point. Again this matter of keeping up the interest expressed must be considered, and the lists of names secured should receive further attention throughout the year. For here is only working material which should be moulded into something definite, and while it is apparent that direct returns may be more difficult to trace at once than from the use of classified notices, one is safe in asserting that ultimate results are equally as effective, because the repeated placing of displays at the same points is cumulative in increasing interest.

Added settlement also supports this statement. It is a method employed with good results by the Canadian government, and I believe experience has demonstrated that fully as satisfactory returns are possible by making these displays at smaller sectional and district fairs in the states mentioned as at state fairs. Only a certain number can view the exhibit and receive proper attention from those in charge, notwithstanding how many there may be on the grounds. As a rule better location can be secured and the array of products forms a greater attraction. During the period covered by this report the department has put on nineteen agricultural exhibits as follows: In 1913:

Illinois State Fair, Springfield
Indiana State Fair, Indianapolis
Michigan State Fair, Detroit
Iowa State Fair, Des Moines
Nebraska State Fair, Lincoln
Kansas State Fair, Topeka
Inter-State Live Stock Fair, St. Joseph, Mo.
Inter-State Live Stock Fair, Sioux City, Iowa

In 1914 displays were made at the same points with the exception of Detroit and Indianapolis, and in addition at,—

Northern Iowa Fair, Mason City
Northern Illinois Fair, Streator
Marshall County Fair, Marshalltown, Iowa
Bureau County Fair, Princeton, Illinois
International Farm Implement Exposition, Peoria, Ill.

In displaying products care is taken to avoid over-emphasis of any particular crop, but rather to make the exhibit representative of products grown throughout the state.

Our relations with officers in charge of these fairs have been pleasant and cordial, and not only in each instance have we been invited to return, but twice the price for space was reduced as encouragement to do so. The manner in which such efforts have been received is fairly illustrated by the following:

"The state of Wisconsin has set an example that can well be emulated by other states. At the fair this year that state has an exhibit under a large canvas, showing the resources of the state and giving it a great advertisement. The state pays the expenses of the exhibit and all other expenses incident to it, so that there is nothing for personal gain in the matter, only to the extent that every citizen of the state is a gainer by having immigration to that state.—Mason City Times, Aug. 20, 1914."

"A compliment has been paid the county fair by the Wisconsin State Board of Immigration, which has sent to the fair a large display of products of the Badger State.

The exhibit includes a complete list of small grains, and seed products grown in Wisconsin. There is also a fine display of apples, which includes most of the common and best-known varieties of the northwest. Of even greater variety and extent is the display of potatoes and garden products, including a great many varieties of root crops and vegetation. The exhibit is well arranged and makes a good appearance. It will be found in a large tent near the agricultural building."—Times-Republican, Marshalltown, Iowa, Sept. 18, 1914.

Lectures.

The department now owns a stereopticon outfit and has a limited equipment of lantern slides featuring subjects in connection with farm development. Coöperating with farmers clubs and civic bodies, the writer gave twenty lectures descriptive of Wisconsin's farm resources within and without the state during 1913. It has been impossible to continue such work this year because communications from homeseekers responding to classified notices require constant attention. This is a field, however, which should be developed, for the attendance and interest manifested clearly indicate it would contribute much toward creating sentiment in favor of the state.

Keeping in Touch With Settlers.

The prospective homeseeker needs the viewpoint of the man on the land, the fellow actively engaged in development, and such

information is best secured by personal visit. From time to time the writer has visited new communities and conferred with those opening up the land and getting started. Occasionally this has been done alone, and at other times in company with men connected with the soils department of the experiment station. We also endeavor to keep in touch with those we have assisted, and who have purchased, by personal correspondence. In this manner we are able more fully to appreciate the situation and to secure information of value in a further exposition of the state's possibilities.

Let it be understood that those writing us are not prompted to do so by a merely curious, inquiring spirit for numbered among them are hundreds of experienced corn-belt farmers, good folks, possessed of some means, a large measure of hope and a heap of determination.

B. G. PACKER,
Commissioner.

Dec. 31, 1914.

FINANCIAL STATEMENT

July 1, 1912 to July 1, 1913.

Packer, B. G., secretary, sal. and exp	$2,435.11
Berry, Rose, stenographer	900.00
Wadsworth-Gilbert Stenographic Office, services Chap. 609, Laws 1911	459.94
Girling, Geo., services per diem and expenses	159.70
American Express Co., express	285.31
Wells, Fargo & Co., express	75.59
Madison Post Office, postage and box rent	345.00
Western Union Telegraph Co., messages	4.80
Wisconsin Telephone Co., messages	142.40
Democrat Printing Co., printing	383.70
State Printing board, paper	585.61
Madison Engraving Co., cuts	10.80
The Print Shop, cuts	10.00
Piper Bros., supplies	26.12
Bayfield Fruit Growers Ass'n, apples	15.00
Ten Eyck, A. A., apples	17.00
Hildeman, E. S., apples	37.50
Ayers, E., photos	9.00
American Multigraph Sales Co., supplies	5.00
Burdick & Murray Co., supplies	1.20
Bonzelet, J. P., corn	14.00
Chicago Live Stock World, subscription	3.00
College Book Store, supplies	5.35
Chicago & Northwestern Ry. Co., freight	1.16
Flanders, O., drayage	10.63
Goodland Co., photos	9.50
Hansen Photo Co., photos	2.00
Haswell Furniture Co., supplies	50.19
Interstate Live Stock Fair Ass'n, rent of space	75.00
Keeley-Neckerman-Kessenich Co., supplies	28.71
Kramer, Henry F., supplies	1.25
Meyer News Service Co., clippings	18.00
Moseley, J. E., supplies	21.72
Sioux City Journal, advertising	5.88
Parsons Printing and Stationery Co., supplies	57.64
Snyder, John, supplies	3.00
Tribune Co., advertising	8.62
Union Transfer & Storage Co., storage	17.80
Van Cleave, H. L., photos	3.75
Milwaukee Lithographing Co., letterheads	29.96
Gribenow, Fred, per diem and expenses	97.28
Krueger, H. E., per diem and expenses	145.29
Streissguth-Petran Engraving Co., cuts	19.54
Sheffer, R. J., services	25.30
Underwood Typewriter Co., supplies	83.03
	$6,646.38

July 1, 1913 to July 1, 1914.

Packer, B. G., secretary, sal. and exp	$2,894.62
Berry, Rose, stenographer	1,035.00
Burke, M. E., stenographer	170.00
Burke, Florence, services	8.00
Bumbalek, J. L., services	31.55
Cobban, A. J., per diem and expenses	292.13
Donald, J. S., expenses	12.86
Dahmer, Francis, clerk	100.00
Engholm, George, services	3.00
Frey, M. C., services	11.00
Girling, George, per diem and expenses	268.69
Griebenow, Fred, per diem and expenses	161.73
Krueger, H. E., per diem and expenses	564.66
Munsell, G. A., stenographer	284.00
Micholski, Ben, services	6.00
Murphy, Lillian, services	62.00
Nevins, Nina, services	89.49
Nevins, Mrs. E. V., services	3.49
Rhea, A. O., sal. and exp	296.73
Rewey, O. G., expenses	6.37
Schroeder, Arlene, services	33.83
Stondall, Agnes, services	10.50
American Multigraph Sales Co., supplies	15.93
Ayres, E., photographs	20.00
American Express Co., express	986.66
Brown, L. W., supplies	20.60
Big Four Sign Co., supplies	5.00
Bates, W. L., photographs	12.50
Breeders' Gazette, advertising	84.00
Chicago Record Herald, advertising	103.88
Chicago Transparency Co., supplies	143.10
Chicago Calcium Light Co., supplies	13.41
Calumet Index, advertising	5.75
Curtis Publishing Co., advertising	81.48
Constitution Democrat Co., advertising	18.76
Collins, P. V., Publishing Co., advertising	27.54
Capper, Arthur, advertising	24.00
Chicago Examiner, advertising	67.80
Chicago Tribune Co., advertising	52.80
Chicago Packer Co., advertising	13.50
Chicago Daily News, advertising	9.60
Democrat Printing Co., printing	1,490.19
Daily Svornost, advertising	49.33
Des Moines News Co., advertising	13.60
Dispatch Printing Co., advertising	40.00
Englehardt, E., covering boxes	35.00
Fairbanks-Frey Engraving Co., halftones	8.81
Farmer & Breeder Co., advertising	18.63
Haswell Furniture Co., supplies	34.25
Hildebrand, R. T., supplies	1.00
Illinois State Board of Agriculture, exhibit space	60.00
Iowa State Board of Agriculture, exhibit space	300.00
Interstate Live Stock Fair, exhibit space	75.00
Interstate Fair Association, exhibit space	25.00
Illinois State Journal Co., advertising	9.00
Inter Ocean Newspaper Co., advertising	57.60
Johnson Livery, livery	1.00
Journal Co., The (Milwaukee) advertising	6.30
Journal Printing Co., (Minneapolis) advertising	20.70

Journal Printing Co., advertising	$9.72
Kansas State Fair, exhibit space	40.00
Keeley, Neckerman, Kessenich Co., supplies	132.31
Knauber Lithographing Co., letterheads	37.50
Kansas City Star, advertising	84.20
Kansas Farmer Co., advertising	54.06
Lorenz, E. H. J., map	140.00
Michalski. L. J., supplies	101.56
Meyer News Service Co., clippings	45.00
Morris, T. S., Co., supplies	3.86
Madison Post Office, postage	201.50
Michigan State Agricultural Society, exhibit space	325.00
Milwaukee Lithographing Co., letterheads	30.95
Madison Tent & Awning Co., supplies	31.25
Madison Leather Goods Co., supplies	5.00
Minneapolis Journal, advertising	87.36
Melville, J. W., show apples	210.00
Moseley, James E., Co., supplies	29.24
Minnesota Tribune Co. advertising	45.00
Minneapolis Tribune Co., advertising	25.92
Minneapolis Daily News Co., advertising	20.70
Nyberg, Ivan, pictures	4.90
Nebraska State Board of Agriculture, exhibit space	90.00
Nielson & Speckner, supplies	27.15
New Gazette Co., The, advertising	14.40
New Era Newspaper Co., The, advertising	3.20
News Publishing Co., advertising	4.90
Olds Seed Co., supplies	31.80
Oelivien Register, advertising	2.40
Olszewski, A., advertising	4.50
Parsons Printing & Stationery Co., supplies	14.45
Printing Board, paper	1,101.26
Piper Bros., supplies	45.50
Parker Press Leader, advertising	2.25
Polish Publishing Co., advertising	3.75
Perkins Bros. Co., advertising	47.50
Rand, McNally Co., maps and supplies	377.63
Streissguth-Petran Engraving Co., cuts	72.02
Superintendent of Public Property, postage, supplies, etc.	2,129.40
St. Joseph Tent & Awning Co., tent rental	35.75
State Journal, photographs	17.70
Sentinel Co., advertising	15.12
Sumner & Morris, supplies	7.30
Stark County News, advertising	10.35
Typewriter Speed Key Co., supplies	3.50
Tyrrell, Jos., supplies	3.60
Toole, W. A., supplies	22.00
Ten Eyck, A. A., apples	10.50
The Enquirer, advertising	33.93
Times Republican, advertising	6.24
Unifile Mfg. Co., supplies	54.72
Viedenburgh Peter, Lumber Co., lumber	1.75
Wehrmann, Chas., supplies	26.75
Wells, Fargo & Co., express	2.51
Wisconsin Telephone Co., messages	12.30
Wadsworth-Gilbert, Stenographic Office, services	448.92
Ward, Joseph, exhibits	175.00
Wolff, Kubly & Hirsig, supplies	8.45
Wisconsin Advancement Association, exhibit boxes	10.92
	$16,841.82

SUMMARY—JUNE 30. 1914, JAN. 1, 1915.

Pay roll	$2,043.30
Postage and supplies—Supt. P. P.	1,812.81
Exhibits	2,842.87
Printing	1,675.71
Advertising	679.16
Maps	671.25
Cuts and Engravings	127.33
Printing Board	421.03
Drayage and storage	24.10
Emergency help	38.00
Miscellaneous	77.66
	$10,413.22
Credit from sale of exhibits	140.75
	$10,272.47

ANNUAL REPORT

OF THE

Wisconsin State Horticultural Society

For the Year 1913

VOL. XLIII

PART I.

F. CRANEFIELD, Editor.

MADISON, WIS.

MADISON
DEMOCRAT PRINTING COMPANY, STATE PRINTER
1913

LETTER OF TRANSMITTAL

MADISON, WIS., MARCH 1, 1913

To His Excellency, FRANCIS E. McGOVERN,

Governor of Wisconsin.

DEAR SIR:—I have the honor to transmit to you herewith the Forty-third Annual Report of the Wisconsin State Horticultural Society.

Respectfully,

FREDERIC CRANEFIELD,

Secretary.

TABLE OF CONTENTS.

OFFICERS AND COMMITTEES, 1913.

OFFICERS.

J. S. Palmer, President ..... Baraboo
F. Kern, Vice President ..... Bayfield
L. G. Kellogg, Treasurer ..... Ripon
F. Cranefield, Secretary ..... Madison

EXECUTIVE COMMITTEE.

J. S. Palmer, Chairman ..... Ex Officio
F. Kern ..... Ex Officio
L. G. Kellogg ..... Ex Officio
F. Cranefield ..... Ex Officio
1st District, M. S. Kellogg ..... Janesville
2nd District, R. J. Coe ..... Ft. Atkinson
3rd District, Lewis Post ..... Madison
4th District, C. D. MacGilfrey ..... Milwaukee
5th District, Henry Wilke ..... Milwaukee
6th District, N. A. Rasmussen ..... Oshkosh
7th District, Wm. Toole ..... Baraboo
8th District, A. D. Barnes ..... Waupaca
9th District, A. W. Lawrence ..... Sturgeon Bay
10th District, J. Ewald ..... Cumberland
11th District, G. F. Morgan ..... Washburn

BOARD OF MANAGERS.

J. S. Palmer L. G. Kellogg F. Cranefield

COMMITTEE ON TRIAL ORCHARDS.

J. A. Hays, term expires .....Jan. 1916.
N. A. Rasmussen, term expires .....Jan. 1915.
A. W. Lawrence, term expires .....Jan. 1914.

LOCATION OF TRIAL AND DEMONSTRATION 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.
Manitowoc, Manitowoc county, 6 acres .....Established 1907.
Gays Mills, Crawford county, 8 acres, (1 A Grapes)..Established 1907.
Whitehall, Trempealeau county, 5 acres .....Established 1908.
Lake Geneva, Walworth county, 8 acres .....Established 1908.
Sparta, Monroe county, 1 acre (Grape Station) .....Established 1908.
Pewaukee, Waukesha county, 3 acres .....Established 1912.
Baraboo, Sauk county, 3 acres .....Established 1912.

The Improvement of Rural School Grounds.

Dist. No. 6. Town of Baraboo, Sauk county.
Dist. No. 5. Town of South Lancaster, Grant county.
Dist. No. 10. Town of Manitowoc Rapids, Manitowoc county.
Dist. No. 3. Town of Sevastopol, Door county.
Dist. No. 2. Town of Fond du Lac, Fond du Lac county.
Dist. No. 1. Town of Genesee, Waukesha, county.

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 southern part of the state in the counties bordering on Lake Michigan, **Baldwin Eureka, Fallawater, Gano, King, Northern Spy, Pewaukee, Willow Twig, York Imperial, Bellflower.**

APPLES (Commercial Orchard List).

It is generally conceded that a commercial orchard should consist of but few varieties; the following are suggested: **Dudley, Fameuse, Longfield, McMahan, McIntosh, Northwestern Greening, Oldenburg, Scott, Utter, Wealthy, Yellow Transparent.**

APPLES (Five Varieties for Farm Orchard).

Northwestern Greening, Oldenburg (Duchess), Talman (Sweet), Wealthy, Astrachan.

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.**

JAPAN 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.

Aroma, Bederwood, *Crescent, Clyde, Dunlap, Enhance, Gandy, Glen Mary, *Haverland, Lovett, *Sample, Splendid, *Warfield.

TWO VARIETIES SRAWBERRIES FOR FARM GARDEN.

Dunlap, *Warfield.

RASPBERRIES.

Black: **Conrath, Cumberland, Gregg, Older.**
Red: **Cuthbert, Loudon, Marlboro.**
Purple: **Columbian.**

CURRANTS.

Red: **Red Cross, Red Dutch, Long Branch 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 south-eastern 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.*

Common Name.	Scientific Name.
Thunberg's Barberry	Berberis Thunbergii
Common Barberry	Berberids vulgaris
Purple-leaved Barberry	Barberis vulgaris var. atropurpurea
Purple Filbert	Corylus maxima var. purpurea
Weigela (rose)	Diervilla florida
Weigela (white)	Diervilla candida
Weigela (Eva Rathke)	Diervilla hybrida
Desbois Weigela	Diervilla hybridia var. Desboisii
Silver Berry	Eleagnus argenta

Strawberry Tree .....Euonymus Europaeus
Althea .....Hibiscus Syriacus
Sea Buckthorn .....Hippophae rhamnoides
Garden Hydrangea .....Hydrangea paniculata gr.
Ruprecht's Honeysuckle .....Lonicera Ruprechtiana
Tartarian Honeysuckle .....Lonicera Tartarica
Tea's Weeping Mulberry .....Morus Alba var.
Mock Orange .....Philadelphus coronarius
Golden Mock Orange .....Philadelphus coronarius var. aurea
Mock Orange, large fl .....Philadelphus inodorus
Shrubby Cinque Foil .....Pontentilla fruticosa
Russian Almond .....Prunus nana
Rhodotypos .....Rhodotypos kerrioides
Smoke Bush .....Rhus Cotinus
Missouri Flowering Currant .....Ribes aureum
Rose Acacia .....Robinia hispida
Japanese Rose .....Rosa rugosa
Golden Elder .....Sambucus nigra var. aurea
Buffalo Berry .....Shepherdia argentea
Bumalda Spiraea .....Spiraea Bumalda
Anthony Waterer Spiraea .....Spiraea Bumalda var.
Billard's Spiraea.....Spiraea Billardii
Douglas' Spiraea .....Spiraea Douglassi
Japanese Spiraea .....Spiraea Japonica
Meadow Sweet Spiraea .....Spiraea salicifolia
Van Houten's Spiraea .....Spiraea Van Houtte
Persian Lilac .....Syringa Persica
Chinese Lilac .....Syringa villosa
Common Lilac .....Syringa vulgaris
Amur. Tamarix..Tamarix Pallassi Desv. (Tamarix Amurense Hort.)
Snowball .....Viburnum Opulus vr. sterile

* 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, Russell's Cottage, Seven Sisters, Gem of the Prairies, Crimson Rambler, Dorothy Perkins.

Five hybrid perpetual roses for the garden: Gen. Jacqueminot, Magna Charta, Margaret Dixon, Mrs. John Laing, Paul Neyron.

COMPARATIVE HEIGHT AT MATURITY OF DIFFERENT SHRURS.

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
Lilac, Persian
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.

Common Name.	Scientific Name.
Bearberry	Arctostaphylos Uva-ursi
New Jersey Tea	Ceanothus Americanus
Button Bush	Cephalanthus occidentalis
Prince's Pine	Cimaphila umbellata
Round-leaved Dogwood	Comptonia asplenifiora
Red Oiser Dogwood	Cornus stolinifera
Leatherwood (Wickopy)	Dirca palustris
Trailing Arbutus	Epigaea repens
Wahoo	Euonymus atropurpureus
St. John's Wort	Hypericum pyramidatum
Winterberry (Holly)	Ilex verticillata
Trailing Juniper	Juniperus procumbens
Sweet Gale	Myrica Gale
Ninebark	Physocarpos' opulifolia
Buckthorn	Rhamnus catharticus
Staghorn Sumac	Rhus Typhina
Smooth Sumac	Rhus Glabra
Dwarf Sumac	Rhus copallina
Wild Red Currant	Ribes Rubrum

Wild Black Currant .....Ribes floridum
Wild Rose (tall) .....Rosa lucida
Wild Rose (dwarf) .....Rosa blanda
Purple-flowered Raspberry .....Rubus odoratus
White-Flowered Raspberry .....Rubus Nutkanus
Common Elder .....Sambucus Canadensis
Scarlet Elder.....Sambucus pubens
Snowberry .....Symphoricarpus racemosus
Coral Berry .....Symphoricarpus vulgaris
[illegible] Hemlock .....Taxus baccata
[illegible]berry ..... Viburnum lentago
Black Haw .....Viburnum dentatum
_____.....Viburnum acerifolium
Bush Cranberry .....Viburnum opulus
Prickly Ash .....Zantoxylum Americanum

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.

SPRING FLOWERING BULBS.

Tulips, Single dwarf; Duc van Tholl pink, scarlet, white.
Tulip medium; red Artus, yellow Chrysolora pink Cottage Maid.
Hyacinth single: pink Charles Dickens, white Baroness von Thuyll, blue Baron von Thuyll.
Narcissus (daffodil), Von Lion.
Crocus: Mixed.
Tulips and other Holland bulbs must be planted in September or October and bloom early in spring.

BLACK LIST

A LIST OF SHRUBS ALL OF WHICH HAVE BEEN TESTED ON THE GROUNDS OF THE EXPERIMENT STATION AT MADISON AND FOUND UNSATISFACTORY.

Common Name.	Scientific Name.
Rhododendron	Azalea arborescens
Rhododendron	Azalea viscosa
Azalea	Azalea nudiflora
Azalea	Azalea mollis
Sweet-scented shrub	Calycanthus floridus
Blue Spiraea	Caryopteris Mastacanthus
White Fringe	Chionanthus Virginica
Sweet Pepperbush	Clethra alnifolia
Bladder Senna	Colutea arborescens
Flowering Dogwood	Cornus florida
Janapese Quince	Cydonia Japonica
Daphne	Daphne Cneorum
Daphne	Daphne Mezereum
Slender Deutzia	Deutzia gracilis
Goumi	Eleagnus longipes
Pearl Bush	Exochorda grandiflora
Golden Bell	Forsythia suspensa
Snowdrop tree	Halesia tetraptera
Virginia Willow	Itea Virginica
Kerria	Kerria Japonica
Common privet	Ligustrum vulgare
Paulownia	Paulownia imperialis
Purple leaved Plum	Prunus cerasifera var. (Prunus pissardi Hort.)
Flowering Almond	Prunus Japonica
Flowering plum (double)	Prunus triloba
Arguta Spiraea	Spiraea Arguta
Thunberg's Spiraea	Spiraea Thunbergii

The plants of certain of the above named varieties made a good growth each year but have not blossomed unless given thorough winter protection. In this class are Bladder Senna, Flowering Almond, Flowering Plum and Golden Bell.

The Japanese Quince is hardy of bush but has not borne flowers except when given winter protection. The Goumi will only bear fruit when protected in winter. The double-flowered Almond will blossom freely if given thorough winter protection, otherwise it will kill back severely. The double-flowered Plum grows well and after a mild winter will bear flowers in advance of the leaves; unreliable, however, four years out of five if unprotected.

The others of this list have either died outright or else barely survived.

TRANSACTIONS

OF THE

Wisconsin State Horticultural Society

SUMMER MEETING

BAYFIELD, AUGUST 21–22, 1912.

MORNING SESSION—August 21.

The meeting was called to order at 9:30 a. m. by Vice President C. L. Richardson, who introduced the Mayor of Bayfield, Mr. William Knight, as the man who, while others were caviling and arguing as to whether or not the northern rim of Wisconsin could grow apples, dared to set forty acres of apple trees.

Mr. Knight: I extend to you the hand of fellowship on behalf of the people of the Bayfield Peninsula. We are pleased to have you here, for we feel that we are going to be benefited a great deal from the experience and knowledge that you can impart to us. Remember that we are only just beginning the development of the fruit proposition in the Bayfield Peninsula. It is only about six years ago since commercial planting commenced, but in the home orchard we have from 25 to 30 years' experience. It is not necessary for me to say much, but we want to prove to you by our acts that we appreciate your coming and that our welcome is sincere.

TRANSPLANTING HERBACEOUS PLANTS.

MR. W. A. TOOLE, Baraboo.

Transplanting is the process of removing a plant from a place where you do not want it to grow, to a place where you do want it to grow.

With many herbaceous plants it is a saving of time and space if seedlings or small plants may be planted on a small area of well prepared and well tended soil, later to be transplanted to a more permanent location.

This talk might well be prefaced by some remarks on the preparation of the seed bed, and seed sowing. I will only say: when it is known that the small plants or seedlings are to be transplanted later, a better root system will be formed if the soil is not too rich, and contains a moderate amount of sand. It should also be well worked up so as to be in the best of condition or tilth.

Before transplanting, the soil to which the plants are to be removed should be thoroughly prepared. Experience in transplanting several millions of plants has taught me that this previous preparation of the soil is very important, not only for the better future growth of the plants but also for greater speed of transplanting. For small or delicate plants that are to be transplanted into flats or greenhouse benches the soil should be sifted through a sieve with a medium sized mesh. With outdoor planting if the area is not large, or the plants are small, the soil should be well spaded or forked over, raked, firmed with a roller or by tramping, and if necessary to obtain results, again forked, rolled and raked. In field planting, trashy stuff or manure should be plowed under, or well disked in. After plowing the soil should be well disked, harrowed and rolled or planked as may be required to put it in the best condition. If the planting is to be done some time later, the ground should be harrowed weekly to conserve the moisture and preserve the texture of the soil.

If the ground is in ideal condition for planting it will be moist enough to hold its form when squeezed in the hand but not wet enough to pack or bake. During dry weather this may be accomplished on small areas by watering and stirring the soil until the right condition is reached. On larger plots of ground where it is not practical to water the whole surface it may be possible to water the rows or hills that are to be planted. If only the surface soil is dry, with plenty of moisture beneath, there is danger that the dry dust will drop into the opening and absorb the moisture from the roots. If not practical to water along the row the dry soil may be scraped aside before making the hole for the roots.

The plants to be transplanted should be thoroughly watered some hours before being dug so that they will be well filled with water when moved, and so that they will separate with better roots. We find it a great help with most plants to lay them out in a row on the ground, as they are dug, and sprinkle the roots with a Scollay sprinkler or small force pump and then scatter soil over them. The soil sticks to the roots and holds the surplus moisture that will keep them from drying out as quickly. We prefer this method of puddling as it leaves the roots spread out and in a better condition to handle.

If the plants have become drawn from crowding, or if the tops are out of proportion to the size of the roots the tops should be cut back.

If the roots are too large to handle easily it may be well to trim them back.

Plants that have been received from a distance should be unpacked at once. Lay them out in rows and sprinkle the roots with water and soil as described before. In case they cannot be planted out at once, heel them in until they can be planted. If the plants come with the roots encased in a hard ball of earth, as small potted plants are often received, loosen the soil somewhat by squeezing with the fingers, and then sprinkle the roots thoroughly several times, or set them to soak in water before potting up or planting out. If this dry ball of earth is not thoroughly moistened before planting, new roots will be very slow to form and the plants will be slow to start into active growth. The following rules should be observed with plants that are to be packed for shipping. Pack so as to keep the tops dry and the roots moist. In warm weather allow access of light and air to the tops if possible. Pack tightly enough that the plants cannot shake about in the package.

There are a few general principles to be observed in the process of transplanting: The soil should be pressed firmly enough about the roots that they are in close contact with the soil and soil moisture; the hole should be of such size and shape that the roots are not doubled up or bunched in a wad. Most plants should be set to about the same depth that they were before being moved.

Most of my experience in transplanting has been with a trowel. This should be strong enough at the neck to prevent breaking or bending in hard ground. I also flatten out a new trowel and change the "hang" or angle between the blade and handle, to suit my own ideas. Be sure that the edge is sharp and the blade well polished, as this makes a very great difference in the speed and ease of planting. In making the hole, drive the trowel well into the soil, slanting it but slightly. Do not pry the trowel over to make the opening, but draw tre whole blade toward you so that the bottom of the opening will be nearly as wide as the top. This allows the roots to drop their full length in the opening. Then take up a plant with the other hand, holding it just above the neck or place where the root and top join, drop the roots into the opening and hold the plant at the right height while the trowel is being withdrawn. Then with the handle of the trowel or knuckles press the soil up firmly about the roots, giving a slanting pressure that will close the opening the whole depth. If the pressure is placed too close to the plant, only the surface will be firmed and the plant may be snapped off at the neck by the downward pressure. The amount of pressure necessary depends very much on the variety of plant and the condition of the soil.

Many planters prefer the dibber or some modification. A dibber is of a heavier build than a trowel. Instead of a thin blade, as with a

trowel, the dibber is round and pointed, or flat and much thickened at the center. The size varies with the plants, and they may be made of wood or polished steel or iron. This is thrust into the ground to the proper depth, given a twist to firm the soil about the opening, enough to prevent loose soil filling the hole, and the plant inserted as the dibber is removed. The soil is then firmed about the roots of the plant by thrusting the dibber into the ground a short distance from the plant and prying the soil over against the roots. I have not used a dibber much except when transplanting small seedling lettuce plants into flats. For this purpose we use a round blunt pointed stick a little larger than a lead pencil. Our secretary, Mr. Cranefield, taught me this method of planting while he was at the College of Agriculture.

A market gardener near Baraboo uses another way of planting large quantities of seedling plants. When planting into flats a furrow is made with a straight edged piece of metal of convenient length. The plants are laid against the edge of this furrow the proper distance apart and the roots covered by pressing over the soil with the straight edge, which partially makes the furrow for a new row. He uses the same idea in planting onions, early beets, etc., in the field. The furrow is here made with a plow attachment to a hand cultivator. The furrow is run partly full of water and then the plants are laid against one side of the furrow and soil thrown back against the roots with the hand plow. I have tried this method and it works well but I have not had enough experience to do either very rapid or very smooth work.

Every planter has some special way of doing some of the processes, and methods differ largely with different sections and with the character of the plant. Often in loose soil, the fingers are the only tools used to make the opening for the roots. For larger plants a spade is often used. Practice and common sense are most needed if large quantities of plants are to be set by hand.

Planting machines are often used to transplant strawberries, cabbage, tobacco, and tomatoes when method and extent of culture make their use possible. They seem entirely practical under certain conditions and are a great labor saver. I cannot give detailed information about their use because I have never had experience with them.

After transplanting, further care is necessary to insure a good start. Where it is possible to do so, watering and shading help to establish the plants, unless cloudy or rainy weather prevails. If watering is done at all it should be enough to really reach the roots. A light sprinkle does little but form a crust on the surface of the ground which allows more rapid drying out of the soil. If watering is done, stir the soil well as soon as dry enough. When the plant is once established, cultivation is much more important than watering except in times of extreme drought.

I should like to call attention to an implement to be used in transplanting that I have found very convenient and that is the point of a lead pencil. Perhaps some of you like to experiment with some of the very small seeds like begonia, and after you have had success in starting them, it may become necessary to transfer them to boxes of fresh soil. In such case having put the soil in good shape, take them up with the point of a lead pencil and press them carefully into the loose soil, and it is surprising how they will improve after being removed.

The Chairman: I think Mr. Toole raised one very good point in his paper when he spoke of transplanting at the time the roots were sufficiently moist so that the ground does not cling too tightly to them, causing the tearing off of all the fine fibrous roots that there are on the plants. Under those conditions you can leave the main root system of one of these small plants apparently, to the view of the naked eye, almost intact and yet you can have it so stripped of the minute, fine fibers of roots that you have cut down the root surface of the plant immensely.

The Chairman: Have any members ever used the sharp-pointed, so-called mason's trowel with success in setting strawberry plants?

Mr. Sullivan: I have used the trowel for the last ten years in preference to any other tool. It is the best tool I can get hold of. A thin blade, worn-out trowel is better than a thick one. If you get a new one it had better be cut off an inch and rounded a little at the sides and sharpened, and it makes a very nice tool.

The Chairman: I had very good success setting 5,000 strawberry plants using one of the old-fashioned mason's trowels.

Mr. Irving Smith: What is commonly known as the garden trowel is, to my notion, a great deal too much curved for most plant setting. If you can get one of them that is only a little curved, it adds very materially to the strength of the trowel. It will not bend like the brick-layer's trowel and at the same time is not sufficiently curved to make the dirt stick to it much. If you can get that kind of a trowel, which is not very common on the market, I admit, though we find them sometimes, I think it is very good in that line.

Mr. W. A. Toole: The kind of trowel that you are apt to find in the hardware store is not suited for the purpose, but in one of our local hardware stores I noticed, looking over the catalog, they had what I thought would just about suit me and had them send for some. They cost about ten to fiftfeen cents apiece, made of a pressed steel, and the handle is driven into the curve. They are in such shape that they are almost straight as far as length is concerned and curved more than one needs. Possibly it is very easy to hammer them into the shape you wish and grind them sharp. They make an ideal tool for the

purpose. I am going to ask Mr. Longland how many leaves a plant ought to have when transplanted.

Mr. Longland: Plant them when the third leaf shows, that is, the first leaf that shows after the two seedling leaves.

The Chairman: What rule would you lay down as to the amount of moisture?

Mr. Irving Smith: Give them what they want. When you water them, water them good, and then stop.

The Chairman: What would your rule be as to the amount of water in the soil for best transplanting condition, how wet should the ground be from which you take a plant?

Mr. Smith: I would just as soon take them from dry soil, so that the soil would drop from it. If the soil is heavy you might break the roots. Of course you water them after transplanting, and in 24 hours, almost, the seedling will start again in fair shape.

Mr. Hildeman: At what time should strawberry plants be set out, after they start growing, or as early as possible?

Mr. Smith: We have set out strawberries for a good many years, and we notice habitually, we might say, unless there are some counteracting circumstances, that the plants that were set earliest were the best. I set out some plants this year the latest that I ever set them out for any bed at all, it was in June, owing to excessive rainfall the ground was simply mud, we could not get at them any sooner. Quite a good many of them died and for no apparent reason other than that they were too far along to set. When they start the first new growth, let it be in their new location, then there is no disturbing of the growth. That has been the experience of a good many this year.

BIRDS.

PROF. A. C. BURRILL, Dept. of Entomology.

I have been considerably interested in my trips about the state in the great problem of the fruit and grain growers as to how much the birds eat or injure the small fruits and the grain. However much we may deplore this loss, we are bound to take note and contrast with this loss, the examination of more than 35,000 bird stomachs by the experts of the United States Biological Survey and others. We need to remember that this very taste for seed-bearing fruits as the raspberry and cherry, has caused these same bird-species to eat the mulberry, nut, ash and juniper berries and later in dropping their excrement, scatter their seeds in barren places, doing incalculable good in reforesting areas old and new. Greater than this good is their power to check insect pests. How many of you have become sufficiently im-

pressed with the enormity of this insect menace? In these later years of farm decline, the annual loss seems to increase, despite many efforts to reduce it. The danger is made worse by a great decrease in the number of our insectivorous birds just when we need them most.

I believe the annual loss is now over a billion and a half dollars, and as far as entomologists are concerned, we should add the loss through insects spreading diseases about $400,000,000. So the whole insect problem with which birds have much to do approaches the two billion dollar limit. Against this I must array the best obtainable figures, that in the last forty years our native birds have decreased in numbers from 20 to 40 per cent, and during the same time that miserable English sparrow has increased nearly 40 per cent of the total bird population, ousting our native birds from our farms and gardens, and does not do the job of insect destruction half as well as the birds he has displaced. I do not say that he does not eat insects, he does, he feeds his young the first two weeks almost entirely on insects.

Let me remind you that birds are only one of the five chief checks to this insect loss, and, as I will try to show you, are by all odds the one most easily controlled and that at the least expense. These five checks are the weather conditions, fungous or bacterial diseases, parasites, predators and good farm management, especially clean cultivation. Of these five great checks to insect pests the bird is the only one which offers relief at least expense.

The English sparrow, which was introduced into North America in 1850, refused to do the work for which he was imported. He is an unmitigated pest. After Michigan and Illinois have spent $100,000 in one-cent-a-head bounties, they have just as many sparrows left at the end of that time as before. The pugnacious little scamp drives out our native birds, pitches their young out of the nest, preëmpts our bird houses and musses up our eaves.

To protect birds by law, to tolerate them, merely, and reduce hunting and unnecessary disturbance of their nests, to muzzle our cats or otherwise dispose of our feline peril (for each cat catches on the average 50 birds a year) is not nearly enough. We must wage active warfare against their enemies, especially the tramp cats and English sparrows. It is a case of conservation; we have to do definite things to make the birds come back. Where people are willing it is more easy to take care of the English sparrow in some country towns than in the big cities where it is hard to get coöperation over large areas. There is one formula of one dr. strychnine dissolved in three quarts of water, put in native wheat to soak it up, dry it and save it for the winter, then make some feeding station in a back yard or town grove, or some good place to collect birds, feed them good grain for a little while during the winter season; then you ought to have somebody in-

terested in the work who knows something about birds to make sure that the birds that come to the banquet at the time are not our native birds, then after some snow storm put out the banquet of poisoned grain, and you will get a large share of the local population of sparrows. That is the only way that the present offers of controlling the English sparrows at little expense.

But we must attract our native birds by choice nesting sites, food and building materials. One of the nicest ways of attracting birds is to plant on your town property, or about your farms, such fruit trees and wild berry bushes as you know the birds like. Then I am sure all of you enjoy building bird houses and taking care of them. You have to show the wild birds where they can come, have the apartments ready for them, and then you have to be on the watch that the English sparrow does not come first.

The bluebird can be attracted, if you have no natural cavity in your orchard or shade trees, by putting up a little bark box beside an orchard tree. Arrange the box so the whole side will come off when we want to clean it annually, or drive out sparrow nests. The bluebird is one of the birds whose food is mostly insects, 76 per cent, of which 28 per cent is beetles and 22 per cent is grasshoppers. Of beetles he often gets the flat-headed apple tree borer which does so much harm to orchards and shade trees, killing hundreds of trees every year, and that, with the horned beetle, causes more loss to the trees of this state than any other one insect. I do not say loss to the fruit, but the tree itself. We are glad to have the bluebird with us then, because he eats such things. He comes earliest on the job and he sticks through the season.

The robin is another early arrival which every grower is more interested in from the damage standpoint than the bluebird. For instance, one-half of all that he eats is made up of insects, and the other half of grain and fruits. I can talk about the robin all morning, because there are a great many things we know about Mr. Robin, and most of them are good things. It is an interesting thing to remember that a young robin will eat 20 feet of cutworms a day, that he eats his own weight every twenty-four hours, and it is fortunate for us that we have such a bird as the robin to be here at spring plowing to clean those things up. The only people who can do anything better than to have the robins and blackbirds to follow the plow are those who train the chickens to follow the plow. The robin is death on cutworms and also death on raspberries. One of the growers at Baraboo told me that during that heavy rain that we had one Saturday the end of July, when it was said over two inches fell in eight hours, that the picking of their raspberries had to be postponed until Monday morning. They started bright and early, but the robins had been there first, and they

reckoned they had lost between six and eight crates on account of stopping and letting the robins get their innings first. That meant a loss, probably, of twenty dollars, but I think where you may lose one dollar a day from the birds during the ripening season, they have been giving you five dollars a day in the process of cleaning up. It is still an open question how many sound cherries the robin eats. Dr. Hodge, of Clark University, Worcester, Mass., thinks they peck largely the wormy cherries. Of course, the robins steal many of the earliest to ripen, but these ripen ahead of time frequently just because worms and decay have started in them. Unfortunately the robin is not holding his own, despite protective laws throughout the northern tier of states, for he is slaughtered in numbers and by methods similar to those by which we lost our famous passenger pigeons. It is only about three years ago that Mrs. Russell Sage gave $15,000 for a campaign of education to see if they would not enact protective laws, but without avail, so we must try to get Congress to pass a national law for the protection of our useful migratory birds. We must not only use our local influence, but the state and national influence in the protection of some of these birds. What applies to the robin applies to many other birds that go south.

The Baltimore oriole, with the orange body and black wings, is another bird that needs greater consideration. He lives largely in the tree tops, eating the worms that defoliate trees. He, with few others, is willing to eat the hairy caterpillars which make large nests in trees in spring, and the tent worm, making tents in trees in the autumn. When you see rents have been made in the web worm's nest, you can feel sure that the Baltimore oriole has been there.

Another bird that destroys the same insects is the cuckoo. That bird is such a glutton on the hairy caterpillars that if he starts on a web he usually does not stop until the whole nest is finished. Every farmer on the edge of a forest should see that he keeps Baltimore orioles and cuckoos on his farm. Set out strings of colored worsted; do not make the mistake of putting out a long strand of it, because the bird often gets tied up in it. If you put it in short lengths the bird may have to do a little more weaving, but he will not get tangled up. The red headed woodpecker with the black and white body, sometimes called the tri-colored bird, is often blamed for stealing fruit, and he often does, but he likes nothing better than to take a June bug, the one that lays the eggs that make the white grub, and crack him open like a nut. We need to have the red-headed woodpecker, the crow and the blackbird on hand to look after the white grub, and the June-bug stage is where the red-headed woodpecker comes in.

The downy woodpecker is perhaps the most common one. The U. S. Government has just completed a survey in Virginia, published in this

year's book of the Department of Agriculture, showing that the downy woodpecker is responsible for killing 50 per cent of the codling moth or apple worm as it rests over winter under the bark, sometimes even 85 per cent of the orchards were cleaned out by the downy woodpecker. The worm makes a little cell for itself under the scales of the bark. Downy does not always stop to rip off the bark, but sometimes pierces right through and catches the fellow inside.

Some people, including some good entomologists, still say that the power of insects to multiply is so great that we never can expect to get the birds to be an important check in holding them down. The late Prof. Smith, of New Jersey, published such a statement. But here is one point on the parasite business, you cannot have parasites enough without pests enough for them to live on. The pest, or host, is a necessity. And you cannot have predators like ladybird beetles and lacewing flies without the pests on which they live. On the contrary, the birds are ready for attack without having necessarily to feed on the given pest in the past in order to grow to a stage where they are ready for attack. The birds are always ready. The predators and pests come in after the pest is becoming epidemic. The birds are the "minute men," the predators and parasites the reserve forces for support in the last attack.

Of all birds which belong rightfully in the home orchard or the home grounds I can think of none to whom I would yield the palm sooner than to little "Bob White." Some of us looking at the beautiful colored birds often forget that birds in plain colors, drab or white, are frequently the best home birds to have, they do not have to wear fancy clothes, it does not cost them much to be kept up. "Bob White" eats 5 lbs. insect matter per year and 8¾ lbs. weed seeds. He will eat 10,000 weed seeds at one clip, he will eat 5,000 plant lice at one meal. They are today raised by hand from the egg, can be kept as chickens around the place, and if they have a proper breeding place, away from cat and dog, can be kept around the house. Chickens or "Bob Whites" are among the best ways to keep your plums from being stung by the plum curculio, unless you want to go through the daily process of jarring them off.

We need to have small houses in greater numbers; we should leave some holes in the barn where the barn swallows can come in, and purple martins must be given colonial houses, you cannot keep a single pair very long, they are very sociable. We must suit the birds according to the type of birds involved. At Warrensburg, Pa., they have two martin houses set by a tree, and that tree has never been sprayed and has no wormy apples, where other trees that have not been sprayed have been wormy, so it appears that birds have an important part to play.

Another useful bird of the air for whom we should provide room by open barn gables or shelves under the eaves is the barn swallow, who protects the horses and cattle from horse flies, eating stable flies and the botfly, whose eggs an animal licks off and swallows, and the eggs hatch and canker in the poor beast's stomach with hundreds of maggots.

The brown thrasher, like the robin, also steals fruit, but 63 per cent of all its food is insects. If we would plant more wild fruits they would forget our cultivated ones to a large extent. In laying out estates or landscape effects, more attention could be given to combining bird fruit trees with highly ornamental effects. Thus the mountain ash tree and sumachs, especially the stag horn, will tide birds through the unexpected and heavy late spring snows. Wild cherries and raspberries are all good, and the birds clean up all fruit tree pests while they eat.

Both man and bird can occupy the same territory without much difficulty. The ancient law forbade a muzzle to the ox that threshed out the grain. Some of the birds will demand toll for their work and this should cheerfully be paid. Others will demand more toll than their work is worth, and these must give way.

WEDNESDAY EVENING.

The meeting was called to order by President Bingham at 8 P. M., the members having spent the afternoon on an excursion to the Bayfield fruit farms, guests of the Bayfield Horticultural Society.

The President announced the following judges: Fruit, L. G. Kellogg and A. W. Lawrence. Vegetables, Mr. Irving Smith. Flowers, Mr. William Toole and Mr. Longland.

WHY WE SHOULD BEAUTIFY OUR HOME SURROUNDINGS.

MRS. E. C. CARVER, BAYFIELD.

Thirty years ago a small town in Southern Wisconsin was in need of thorough renovation. Its lawns were surrounded by the old-fashioned fences of the day; they were grown up with grass and tangles of shrubbery. Trees were untrimmed and the town though beautifully located presented a dilapidated appearance. This was the condition of things when a patriotic citizen, the pastor of the Congregational church, determined to appeal to public pride and awaken the citizens if possible to the necessity and advantages of beautifying their homes and

the town generally. He therefore secured the town hall and called a public meeting of the citizens of the town to discuss its improvement. Since he was an influential man, the citizens attended this meeting in large numbers and listened to an address on town improvement. As a result of this meeting a day was set apart for tearing down the old fences, cleaning lawns and streets, trimming trees and shrubbery.

This practice was kept up for a number of years until the desire for cleanliness and for beautiful surroundings became a habit with the people of this town.

The town became, and is today, famous in its region for its fine homes, its oiled and paved streets and its beautiful trees and lawns. Any one who has visited Delavan, Wisconsin, in recent years and who saw it thirty years ago will realize what can be done when public pride is once awakened to the importance of beautiful surroundings for its people and especially its children.

I speak of this town in particular as it was my home town for several years. What is true of this town, can be made true of Bayfield.

Our schools and public libraries are endeavoring to create in our children love for literature and nature and our churches a love for religion and spiritual things. A town or a city should see to it that its streets, its homes and its public buildings aid and not hinder this education which is being worked out for the children of our generation. In this matter the citizens and the public school must work together.

Professor Bailey, the well known horticulturalist and lecturer said once that the farmer of the future must be educated, and that his education would furnish a background for his appreciation of the natural objects by which he was surrounded. He must know the botany of his grain, grass and trees. He must know the science of his animals, and then he would understand and appreciate his surroundings. This is true of all men and women and must be true of our children in the cities and towns of Wisconsin. They are the builders of the cities and towns of this new north Wisconsin for the next generation. How are they to build them? What shall be their model? The public schools of Bayfield, its fathers, mothers and the citizens must start them along the right path by furnishing education and beautiful surroundings which will create habits of pride and an appreciation of beautiful things.

It is only necessary for the citizens and parents to aid and foster the principles instilled in the schools to secure results from the children.

Interest the children in the home grounds and garden. Give them a little patch of ground and some flower or garden seeds and let them

have it for their own. They will enjoy it immensely and it will help to keep them interested. The interest and even affection which children acquire for trees and animals is a striking illustration of what may be done toward their education in these matters.

A little girl who had been trained in the public schools and at home to love natural objects and to study their habits came home from school and found a tree cut down in her father's lawn. She burst into tears and said she liked that tree and thought it was beautiful and she liked to see it on the lawn. This particular tree was not a very beautiful one, and was not properly placed in the lawn, but the little girl had invested it with beauty and interest, because she had been taught to appreciate and love natural things.

The child was asked if she would not like to make a collection of butterflies. "Shall I collect dead butterflies?" she said. When it was explained how she could collect and kill the live butterflies, she said she wanted them to live and would not kill one of them any more than she would her pet cat or dog. This is an illustration of the fact that the school and the home education and surroundings are wonderful forces in training the sympathies and ideas of children with reference to the natural objects which go to make up their surroundings.

It is the business of every community to see to it that the streets and roads along which their children go to school shall aid the schools in their attempt to educate the children to be town and city builders of the right kind, for the future.

No region of our country has more natural beauty than northern Wisconsin. Nature has done her best for us. We must do what we can as citizens to educate our children to an appreciation for, and an intelligent interest in this, their favorable environment.

THE CHERRY TREE.

MR. R. J. COE.

A few years ago there was very little interest taken in the cherry tree, we find that true in most parts of the state even to-day, but with the crops they have had in Sturgeon Bay the last few years, and the wonderful crops they are bound to get the next two years in Bayfield, an awakened interest in cherry-growing is apparent, and if we grow cherries, of course we must have trees to grow them on.

A good many of us have an idea that cherry trees are grown as apple trees are grown. They differ in this way, that apple trees are usually planted from root grafts planted in the spring and taken care of two or three years, as the case may be. Cherry trees are grown

from buds. Little seedling trees are planted in the spring and along in July they are budded. Now, I suppose some of us do not know just exactly what budded trees are, or just exactly how trees are grown by budding. Seedlings are planted in the spring and when they start to get a nice growth the trees that we want to propagate from the branches that are grown this year, are cut off and the buds taken from them. The little buds that grow in the angle of each leaf are the ones that are used for propagating. The budder takes the bud sticks from the leaf and before they go into the field the leaves are cut off, leaving a little stem about a quarter of an inch long. When the bark will loosen from the tree is the time to insert the buds, and these bud sticks are taken into the field and cut as they are used. In a short time this bud will grow to the body of the tree. Of course that bud does not grow this year, it just simply grows on to the tree. We do not know exactly why it does this, but it is one of nature's processes of healing. It will grow to the tree and next year is when it starts to grow. These trees usually grow in the first season, two, three, four or five feet high and from ⅝ to ¾ inch in diameter. This is the one year old tree, and that is the one that is planted very largely. I think that is all that is necessary to say about the tree and I shall be glad to have questions asked.

A Member: Does the budded tree branch the first year?

Mr. Coe: Yes, considerably.

Mr. Toole: Does it make any difference on which side the stock is inserted, whether next to the sun or not?

Mr. Coe: It does not make any difference with reference to the sun, but you will find you had better bud it on the side toward the prevailing wind. In other words, in Wisconsin, in our part of the state, the prevailing winds are from the southwest, it is better to bud on the south or southwest side, they are not so likely to break off by the wind.

A Member: Something was said just now about the appearance of a tree seven or eight years old. I noticed in the state orchard to-day some of the trees seemed to have long splits down the side of the tree. I am sure those trees are going to die. I lost over 100 trees that same way. I should like to know something about the cause of that split.

Mr. Coe: There might be two or three causes. Probably the greatest cause is the severe freezing last winter. The freezing of the sap in the tree expands it and splits the tree open. Probably that is the cause.

A Member: Is there any way of preventing it?

Mr. Coe: Last summer we had a very dry summer and a very wet fall, and the trees went into winter green. In other words, the growth cells of the tree were not well filled with starch or plant food.

The trees were green with sap and with plenty of moisture for the cold weather to expand.

A Member: Would you cut as large a limb off a cherry as an apple?

Mr. Coe: I think I would rather risk the apple in cutting off large limbs. However, you will find cherry trees heal over almost as rapidly as the apple.

A Member: What size do you prefer for the stock?

Mr. Coe: One that would be about 3/16 of an inch.

A Member: What stock?

Mr. Coe: I think I would prefer the Mahaleb. There has been a great deal said of late years about the Mazzard stock, but I have made quite a little inquiry, and the general opinion is that Mahaleb stock is much better.

A Member: In planting the tree, would you plant it below where it was budded?

Mr. Coe: I would plant it pretty deep, but that depends on your soil. If you have a heavy soil, likely to be tamped down well, I would not plant the tree much below the bud.

CULTIVATION AND COVER CROPS.

THOS. W. BOYCE, MILWAUKEE.

The speaker does not pretend to be a horticulturalist. He was born and brought up a common farmer, but deserted the farm before he attained his majority to enter one of the professions. But the call of the land has been insistent and he has finally returned as part owner of a young cherry and apple orchard. Charged with the responsibility of overseeing the planting and care of some 17,000 trees, he has been busy during the last two years learning the A B C's of orchard care. The remarks that follow are prompted by his experiences, costly and bitter as some of them necessarily were.

CULTIVATION.

The proper cultivation of your cherry orchard will begin some time before the trees are planted. Land must be in good tilth to grow trees successfully. Trees will live and sometimes grow in sod or in hard, lumpy or baked soil; but a passing glance at any two trees or lots of trees—the one planted in well worked land, the other in soil equally suitable for orchard purposes, but in poor physical condition—will convince even the beginner that trees will not prosper in any old place and that it pays to get your land in good condition before planting.

If possible, raise a cultivated crop on the area you intend to plant to trees the following spring and then see that this crop gets cultivated. If this is not possible, deep plowing with thorough cross disking and harrowing will probably secure the required fineness and depth of soil.

This preliminary preparation of the soil will show results in the orchard as the years go by. One effect will be to deepen the soil, thereby creating greater foraging and roothold area for the trees. The roots of a tree will follow the lines of least resistance. If the soil is shallow, the roots will radiate close to the surface of the ground where every passing of plow and harrow will injure them and where drought first affects the soil. If the soil is in good tilth the roots get started right at the proper depth, forever out of the way of injury from plow, cultivator or drought.

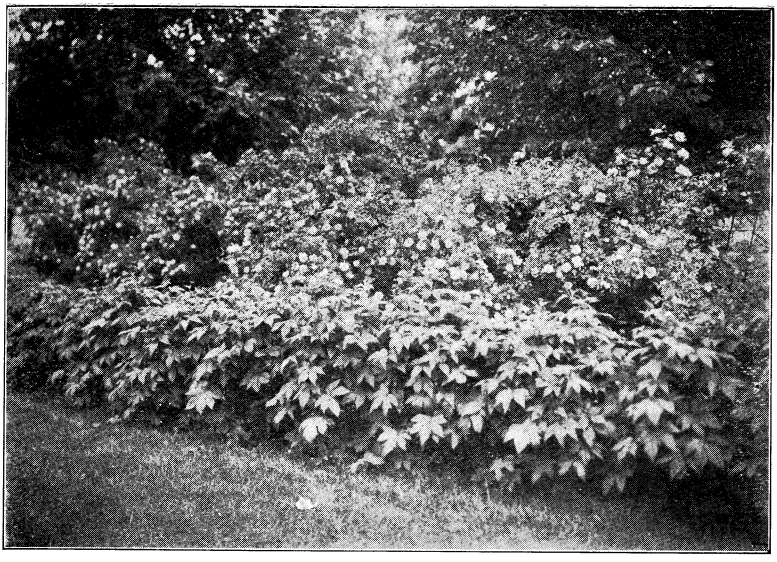
Another result of this preliminary preparation will be to fine the soil, thus presenting greater feeding surface for the roots and creating greater moisture holding capacity. All practical moisture in this state comes from the rains and snows of the seasons. The soil must act as a sponge to absorb this moisture when it falls and hold it until needed. A soil in poor physical condition absorbs but little moisture as it falls, is soon streaked with cuts and gullies from the wash, and soon suffers from lack of moisture, even if a dust mulch is secured at once. It is surprising how much water a soil in good tilth will absorb before it becomes saturated. This difference in moisture holding capacity of the two soils may nicely be illustrated as follows:

Take two pails—bore a hole in the bottom of each—fill one with sand, the other with good sized pebbles—pour slowly a gallon of water into each pail—then measure the amount of water that runs from the bottom of each. There will be precious little in the one instance and almost the entire gallon in the other. Yet a particle of sand does not absorb moisture in a greater degree than a pebble.

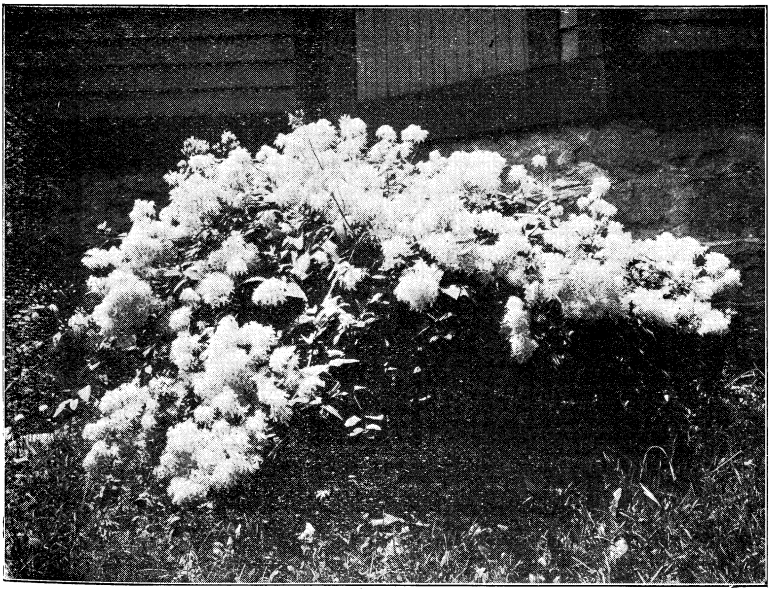
The rains and snows provide ample moisture for the orchard. The business of the orchardist is to prepare his soil so that the moisture may be conserved for use as needed.

Now that your preliminary cultivation has received attention and your orchard planted, *what follows?* Cultivate. Begin as soon as the orchard is planted. Cultivate to improve the texture of the soil. Rocks may contain abundant plant food, yet very few plants are able to get their food from rocks. Hard, lumpy soil certainly contains the chemical elements necessary to support trees, yet the physical condition of the soil is such that trees will not thrive there. Cultivate to fine the soil, to keep it mellow so that your trees, through their roots, may avail themselves of the quantities of plant food stored there.

Cultivate the entire surface of the orchard. At first, of course, the roots extend through but a small area. If the entire soil between the trees is kept in good physical condition the extension of the roots is fa-



Rosa Rubifolia with border of Rubus Oderatus



Clematis recta

cilitated. In any healthy cherry tree the area of the root system is as great or even greater than the area of the top. A fine root system is essential to the success of the tree. A glance at the tops of the trees in any healthy cherry orchard a few years old will indicate that the roots penetrate to all parts of the area between the trees. Keep all the soil in good condition to accommodate the roots and nourish the tree.

Cultivate to conserve the moisture with which the snows of winter and rains of spring have saturated the ground. Remember, there is sufficient moisture in the soil to last the tree the entire growing season, if this moisture is properly husbanded for use as the tree needs it. Every child of the farm knows or should know that the dry, soft soil on the top of the ground created by the passage of harrow or cultivator acts as a nonconductor of moisture and thus prevents the evaporation of the moisture already in the soil.

Do not wait until the ground is dry and baked before you start your harrow or cultivator. It will do no good at that time. Cultivation never puts a drop of moisture into the soil—it merely conserves what is there. When once the soil becomes dry, rains must supply moisture. If there is a season of drought the trees are sure to suffer.

Cultivate about every ten days, so as to preserve this dry mulch on the surface of the ground. Cultivate also after every rain so as to renew this mulch. Never let the surface of the ground in your orchard become hard or crusty during the growing season.

Continue this cultivation as long as you wish the trees to grow, or as long as they may safely be permitted to grow. If the season is unusually moist, July 1 should mark the end of active operations. In an average or dry season cultivation may continue with safety to July 15 or even August 1. Watch the growth of your trees and your season and govern yourself accordingly.

This growing season has been unusually rainy in the Door county region. Trees planted in sod or among uncultivated crop, such as peas or rye, have apparently prospered this year. They do not look as thrifty as trees that received clean cultivation, but they have maintained themselves. This exception, however, does not invalidate the rule that *cultivate, cultivate, cultivate* spells success in a cherry orchard. A tree may maintain itself for a time in sod or among uncultivated crops if moisture conditions happen to be favorable; some one may point to an odd tree growing under such conditions and bearing fruit; but the wise orchardist will not be misled by these exceptions. He will bear in mind that a modern commercial orchard is an artificial product in that he is endeavoring to secure an abnormal product in the way of fruit. He will maintain the artificial condition of the orchard, not the natural conditions of the forest.

COVER CROPS.

Before going into this important topic it may be well to answer the question, "What crops, if any, may properly be grown in the young cherry orchard?" The answer will depend upon the condition of the soil in your orchard. If the soil is not mellow, keep to clean cultivation, followed by a cover crop which will eventually be worked into the soil to add humus. If the physical condition of the soil is good any crop requiring clean and thorough cultivation may safely be grown for a few years, providing the plants are not placed too close to the young trees. Hay, grain or strawberries should never be grown, for cultivation will surely be omitted and then these crops make great demands upon the moisture in the soil that should go to the trees. Potatoes, beans, sugar beets or other low growing crops that begin to demand moisture from the soil *after* the trees have made their growth have been successfully grown between the tree rows and the trees have also thrived because of the intense cultivation necessarily given. A three foot space should be left around each tree the first year. It should be increased at least a foot each succeeding year. After the third year the root system will have become so extended that no crop is advised where trees are planted twenty feet apart.

The danger in growing a cultivated crop lies in the likelihood of the orchardist to neglect the sowing of a cover crop in the spaces around the trees. In our region cultivated crops are the rule in young orchards and cover crops are rarely sown in the tree spaces. Last winter's severity levied a heavy toll upon the young orchards and hundreds of dead trees this spring bore silent testimony to the necessity for cover crops.

A cover crop may be defined as any sown crop used in an orchard between the normal periods of cultivation, not for the purpose of the crop itself, but to secure mulching and maintain proper physical conditions. The ends to be attained may briefly be stated as follows:

First.—A cover crop hastens the ripening of late wood growth and thus prevents top-killing.

Trees should have made their growth by July 15—they need the balance of the season to ripen the wood. Climatic conditions, however, may be such that growth may tend to continue after that date. If this be permitted, the wood will not ripen and will be killed back during the winter. As stated previously, any crop grown among the trees will use moisture that would otherwise go to the tree. Take the moisture away from the tree by growing a cover crop and the growth will discontinue and the wood ripen into condition to withstand the cold of winter.

A remarkable illustration of injury to late growth occurred with us last year. About July 15 a severe hailstorm visited one of our or-

chards, stripping the major portion of the foliage from the trees. Nature set to work at once to renew the foliage and the trees continued to put forth new growth until early fall. A casual observer would have thought that the trees would survive the effects of the hailstorm. But we were obliged this spring to replace about 4,700 of the 5,000 damaged trees. Mute testimony to the futility of late growth.

Second.—A cover crop prevents deep freezing of the ground, thus preventing root injury.

If the orchard has been properly cultivated during the growing, there will be few weeds to catch and hold the snow. Snow is a great protection to the ground, keeping the cold from penetrating to any great depth. If snow would only fall gently upon the earth in early winter and lie there until spring, possibly a cover crop would not be necessary. But the blizzards of winter sweep the snow from the open stretches and pile drifts in the roads and along the fences. A mat of vegetation is of inestimable value to catch and hold some covering of snow.

Third.—Where land is at all hilly the rains of fall and spring will tend to wash the soil down to the lower levels, leaving the hillside streaked with gullies. It is surprising how little washing will be found upon this same hillside if a good cover crop is upon the ground.

Fourth.—There is more or less sap movement in trees during the winter. If the ground has little or no cover of snow, the cold dry winds of winter will subtract much moisture from the soil. When the ground is dry the tree top does not get sufficient moisture and top-killing results. A good cover crop will afford some protection to the soil during such a season.

Fifth.—A cover crop will add vegetable matter to the soil. It is well known that orcharding is a method of cropping that returns little to the soil. Only the leaves fall to the ground. Any rank vegetation grown during the late summer and fall and plowed under the succeeding spring will add humus and tend to keep the soil in good physical condition.

Sixth.—A cover crop will keep down weeds. Weeds are of little value for cover. One of the objects of cultivation is to eradicate them. When cultivation ceases, as it should, in July, the weeds will surely grow unless there is some stronger and better crop to take their place.

The proper time to sow your cover crop will depend upon the amount of moisture in the soil. If your trees have made their normal growth by July 10, your cover crop may be sown at once. If the season has been dry, August 15 will not be too late. Bear in mind that one of the objects of your cover crop is to discourage further growth and thus ripen new wood by diverting the moisture to this crop, that would otherwise go to the tree.

Your choice of a cover crop will depend somewhat upon the physical condition of the soil. Where young trees are making all the wood growth they should, some crop like rye, oats or buckwheat for cover purposes only will answer very well. On the other hand, it may be necessary to add fertility to the soil so that proper growth may be secured; in which event a crop of field peas, vetch or clover may be grown and plowed under.

Rye will grow in poor soil and can be used when a proper stand of some better fertility adding crop might not be secured.

Oats, if sown thickly, cover the ground well.

Buckwheat produces a rank growth for cover, but should not be used persistently.

Field peas and oats are a good combination for cover and for humus.

Buckwheat and vetch seem to be ideal for the young orchard. The buckwheat makes a rank growth for cover. The vetch grows until late in the fall. In the spring it forms a green mat which, plowed under around June 1, adds unmeasured fertility to the soil.

Clover is the ideal crop for increasing fertility. When sown, however, at this time, a cover crop should be sown. The catch is not at all certain. If sown in the spring, cultivation must be omitted in order to secure a catch, and for this reason its use is not recommended.

In closing, permit this statement: It requires good sense, intense care, unlimited patience, time and money to grow cherry trees. A successful cherry orchard is not an accident.

THURSDAY MORNING.

PLANTING AND PRUNING THE FIRST SEASON.

A. W. LAWRENCE.

I am going to presume in this paper that the tree has been selected, age, size, variety, etc., so that all there is to do is to begin planting. The ground being prepared for me, which ought to be free from roots, stumps or stones as far as possible, so that the planting can be done right.

There are many theories and ideas about tree planting, in order to get a good stand, but after superintending the work of planting a good many hundred acres, I find that there are a good many theories that are only theories, and that tree planting is only the exercise of good clear common sense, well applied.

The getting down on your knees and working the dirt among the roots of a tree, as shown in illustrations, looks all right on paper, but doesn't work out in the field, with the busy man. He must plant right, he must plant in season, and if he has much to do, he must accomplish

something. Therefore he begins to use his head, and we find that when he begins to think that something is going to be done, unless he is naturally careless—in that case, he will never have an orchard any way.

I have seen people let trees lay around exposed to the sun and wind for several hours, then spend five times the amount of labor necessary to plant a tree and the tree would die. Perhaps in the time he spent planting the tree by his methods he killed it. Trees are like all other plants that are transplanted, a little neglect here, and a little there, is what causes their death.

Of course this sometimes happens before we get the trees, but never in our experience have trees, that were in good condition when received and that did not get some unavoidable injury, shown anything but a very slight loss, oftentimes planting thousands of cherry trees and not losing 1 per cent, while the same trees grown by the same man, packed by same party, loaded in same car and handled the same, until getting into the hands of the planter, show a loss of 20 per cent.

Now how do we plant a tree? We simply dig a hole large enough to receive the roots and deep enough to place the tree down to the bud union, throw in some good surface dirt, then fill the hole half full or more and tramp it firmly. If the ground will permit thorough tramping, otherwise we are careful about tramping too much on wet soil. The hole is filled up and tramped again, then a shovel full put over the tramped surface.

Now when I say tramped, I mean tramped down firm, using your heel instead of a little pressure with your flat foot. Often we find trees are not tramped firm enough when planted and they do not live—proving the work of a careless planter. This we usually watch for when pruning, which is done after planting, and all such trees are tramped firm again.

Now I have the tree planted without pruning the roots, but I will let it go, it will live anyway, and besides it was a fall dug tree and I didn't intend to prune the roots. If it had been a spring dug tree, I would have pruned the bruised ends some, providing it had not been dug long enough for the healing or callousing to start. Pruning the roots can be done in several ways. If you have lots to do, and many to prune, I find a good sharp hand axe and good block makes quick work, otherwise you could use a sharp knife.

Pruning of the top is a small job and ten, twenty or forty acres should be accomplished in short order and done well.

Here is where the mistakes are made. Some prune while others only cut back. The cutting back method, without doing much pruning, may not be so bad, if followed up in after years with some system of pruning. However, it is better at the start to prune with reference

to placing or establishing a form to the tree, relieving as much as possible close clustering of limbs, and giving some care as to location of buds.

About three-fourths of the top should be removed on the average one and two year tree.

For example, take a well grown, well branched one year tree, as it comes from the nursery. This tree usually has too many branches, and too many heavy branches, several of the lower ones being nearly as large as the body of the tree. The head of the tree ought to be started about 16 or 18 inches from the ground, and in pruning for this two or three of these large branches will usually have to be removed.

We leave a leader on our trees, and as the one year tree is generally pretty well shaped, there is not very much pruning to be done.

The two-year-old tree is usually a different proposition, it will invariably be found with two or three limbs of about the same size at the top of the tree. One or two of these must be removed so as to add strength and vigor to the one most upright, which should be cut back and left as a leader. Every limb on a transplanted tree should be cut back, the heavier ones from one to three buds and even those which are very small and short, though left for their desirable position, should have the terminal bud removed.

DISCUSSION.

A Member: What objection do you have to pruning?

Mr. Lawrence: We have no objection if the tree is small, if you do not make too much of a scar. There would be no advantage in cutting if the limbs were evenly divided on the tree, I do not think there would be any advantage in pruning them all off. In the care of the one year tree, the limbs are small, light, come out very uniformly, make nice shaped heads.

A Member: Will you treat all varieties of cherry trees of different habits of growth the same way with reference to leaving the leader? Take the Morello and some other varieties that naturally have a higher habit of growth, do you treat them the same way?

Mr. Lawrence: I think I would. We have had little experience with the Morello. I know of no reason why they should be bobbed off. We find in pruning the cherry we have a different proposition than we have with the apple. In the cherry the limbs come out in clusters, to form the head. If cut off abruptly it would tend to weaken that head. We find they decay much more rapidly with the head or cluster trim than they do with the limbs more evenly distribut-

ed with a larger trunk. We strive to get a longer trunk, the limbs more evenly distributed.

A Member: Do you ever cut the leader from the tree?

Mr. Lawrence: We do not now, we used to, in former years. We find on the older trees we have a great deal of trouble where the leader has been cut out.

A Member: Do you not cut the leader back at all?

Mr. Lawrence: Certainly we cut it back but leave it longer than the side branches.

A Member: Do you advise trimming apples the same way?

Mr. Bingham: On most varieties of apples we cut them back more severely than the cherry.

A Member: You mean the second year?

Mr. Lawrence: No, the first year. Never cut them back after the first year. Cut out limbs, but never cut back the growth.

A Member. Do you cut any off at all after the first year?

Mr. Lawrence: Not unless it happens to be growing in the wrong direction, unless too many side branches come out. We might cut out some of the new growth, but not if it is in the right direction. In our locality we do not get too much growth. I hardly think, from anything I have seen here, you will get too much growth. There are sections of very rich soil where possibly there is more growth than should be left.

Mr. Smith: In pruning, do you leave just two buds on the leader?

Mr. Lawrence: That would be plenty,

PRUNING THE SECOND SEASON.

PRESIDENT D. E. BINGHAM.

Pruning the second season is a short job. After pruning the first year, as Mr. Lawrence has told you, heading back and thinning out, then the tree is left to grow that season. The next year you will find that all the buds that were left on the tree do not start. Perhaps you have not been careful enough in pruning, because it is necessary to go over your work rapidly and you do not get the limbs cut back to the best buds, therefore perhaps the tree is a little bit out of shape after growing one season; the terminal bud may not start; or may have been brushed off by your sleeve in pruning, all those things have to be watched. In pruning the tree the first year it is necessary to watch that you do not knock off the end bud that you have cut back to, because if you do it is the next bud that is going to make the growth. If that bud is an outside bud, or running in the side direction, it will make a growth in that direction, but it may be that the

last bud that you left on that tree would be a bud making a shoot upward or toward the center of the tree. Going over the second season we attempt to cut out those limbs in the center that are not in position to make the proper form of tree. It is a small matter, under the supervision of a man who knows what to cut out, to do the pruning for the second season, giving the top an outward spread rather than allowing it to cluster in towards the body and making a dense top. The tendency of all cherry trees is toward a dense head and naturally the pruning the second year is to avoid that clustering at the center, and of course, remedying defects we have overlooked the year before, taking out some more of the limbs that we find have a tendency to throw the tree out of balance and to get them properly distributed around the tree. We like to have limbs alternating around the tree, so our pruning the second year is merely to give the tree good form, cutting out the little branches that grow through the center.

DISCUSSION.

A Member: At what time of the year would you prune the second season?

Mr. Bingham: This pruning is all done in the spring of the year. We figure on pruning before any growth starts, say along in March or April. All this work is done with a good pruning knife. We may use a saw on the cherry after about the fourth year, before that time all the pruning can be done with a knife. I do not like shears, they are too slow. You cannot get down close to the body without bruising more or less, and a curved blade pruning knife is best. You take hold of the limb, bend the limb just a little, and when you get used to cutting, cut at the proper point and never cut into the limb above or hack into the body of the tree, and the limb heals over much better and does not leave a crushed stub, like the pruning shear does.

A Member: Do you advise cutting back any after two years?

Mr. Bingham: No, we do not cut after we get them pruned and headed back. You can head back an apple tree, but not a cherry with good results. If a tree is growing very rank, long and sprawly, it will be advisable to cut back, but usually we have plenty of thick top, so we do not have to cut back to form the dense head. We aim to get an outside bud, or a bud on the bottom side of the limb, or a side bud, and avoid as much as possible the buds on the top of the limb that will grow toward the center of the tree, or spread out.

A Member: You aim to cut close to that bud?

Mr. Bingham: Yes, if you do not you will have a long stub that looks dead the second year.

A Member: What effect would it have on the cherry tree to trim now?

Mr. Bingham: Well, you would remove some of the leaf surface which is helping to build up the root system at this time, and I hardly think it would be advisable to cut off many of the leaves now. I cannot see any advantage in doing it now. Then, of course, the scars are not properly healed over, and you will perhaps have more winter-killing with fall pruning.

A Member: Would you trim in June?

Mr. Bingham: No, I would not, unless I had a reason for it. If I had a tree I wanted to experiment with to produce fruit buds, I would perhaps do a little summer pruning to remove some of the leaf surface, but I would not prune a bearing tree in June, because at that time the fruit is on the tree, there would be no object in pruning at that season of the year.

Mr. Richardson: You spoke of four large limbs below intercepting the flow of sap to the leader. Do you find in the same way that they intercept the flow to other limbs above?

Mr. Bingham: Yes, directly above. In pruning we avoid two limbs coming out on the body of the tree, one directly above the other, because the bottom limb is going to take the growth and the other will be dwarfed. That is why the spiral arrangement of the branches when one is not directly above another, is better.

A Member: Three limbs, as a rule, would not affect the leader?

Mr. Bingham: Well no, not usually, if they are evenly distributed. We have very good trees of that type now. The first one year trees that I planted are of that type. I did not cut them all off, and I found I had trouble in those limbs getting so large, one season's limb would be almost as large as the balance of the tree and split down with the heavy load of fruit later on. I left those limbs too closely clustered at one point. We are avoiding that and seeing much better results.

PRUNING THE BEARING TREE.

MR. A. L. HATCH. (Read by Mr. Ulsberger).

Bearing fruit modifies a cherry tree very materially. The most important modification, is in the vigor of different branches, as well as that of the entire tree. Those branches bearing the most fruit may become less vigorous than those bearing none. Sometimes excessive cropping produces complete exhaustion of a branch and it may fail to grow at all the next season. In the early spring pruning, these exhausted limbs should be removed.

Cherry trees now planted for commercial purposes in Wisconsin produce fruit upon spurs borne upon branches of one or more years growth. Hence it is easy at pruning time to see the probable crop of the coming season. This gives opportunity to thin or lessen the crop of the tree by pruning away the fruiting branches when they appear in excess.

Bearing trees produce many small lateral or side branches of but one or two season's growth. These often die because poorly nourished, because the larger branch from which they emanate monopolizes the growth. These slender branches usually show no enlargement or swelling of bark at their base, while vigorous laterals always do. The removal of these slender limbs is desirable.

The tendency of growth in a fruit tree is upward and outward, along and through the most direct and thrifty limbs. This tendency often causes one part of a branch to absorb more than its share of strength, very much to the disadvantage of the other part. These over vigorous limbs sometimes need removal, cutting back or shortening in, and surely so if much in excess of the average vigor of the entire tree.

While neglected and weak trees can be made more vigorous by pruning the important thing in managing bearing trees is to maintain an even growth of all branches, and this can be done by pruning along the lines already indicated. Properly done, at the right time, pruning tends to develop fruit buds the following season. The right time is early spring before the sap flows and after severe cold occurs.

THE SEASON OF 1912 IN BUGLAND.

PROFESSOR J. G. SANDERS.

Possibly some of you know that I have charge of state orchard inspection in addition to the entomological work of the station, and in that connection I want to call your attention to a few things which apply locally and to conditions which I think you ought to take to heart as much as possible.

This is a new country from a horticultural standpoint and naturally you have few fruit insect pests; less than are found in old orchard localities. You have that advantage, as well as some disadvantages that confront one in planting in a new country, but certainly a distinct advantage exists and there is an opportunity for you to exercise great caution in the stock that you bring in here. You should be very careful where you buy young trees which are produced in various parts of the country, and be sure that they bear inspection tags, which in a cer-

tain measure will insure that they are free from insect diseases and pests.

As I said, there are many insect pests in various parts of the country which are not represented here and which will be introduced if you do not use great caution.

Prof. L. R. Jones, from the College of Agriculture, is our plant pathologist; he unfortunately is not able to be here this morning. His line of work is the study of fungous diseases, and he coöperates very effectively with me in this inspection work.

I think it has been pretty thoroughly instilled into the minds of all of you that spraying is an absolute necessity if you wish to produce perfect fruit. The orchardists and fruit growers here are of a progressive type who have made it their business to read up on these problems and put them into practice. There are a few things I want to mention this morning in regard to spraying. I have heard here and there several say that they spray while the tree is in full bloom. That is a mistake. Do not under any circumstances spray a tree for insect pests while it is in full bloom, because you are very likely to ruin your setting fruit. Wait until the petals have fallen, it does not matter even if five or eight days elapse, so you do not go beyond the twelve-day limit, you can spray with any arsenical poison, preferably arsenate of lead. That insecticide s not so well known to you as Paris green, but it is a far better material, because it will not burn the foliage, and you can apply it even stronger than the formula calls for without danger. It has another side in its favor, and that is, that it will adhere to the foliage much longer than Paris green in case of heavy rains, in fact, it will remain on for a month or six weeks, if rightly applied.

The all-important thing in controlling the apple worm is getting arsenate of lead down into the calyx cup of the apple. If you will examine an apple flower carefully, you will find five large petals, and within a bunch of yellow stamens, in the center of which are long filaments and those filaments form a roof over the calyx cup; almost a solid roof when the flower is young. Now, if you wait till the petals fall and then wait another three or four days, you will find those stamen filaments which cover up the calyx cup have dried and opened up, so the poison can be forced into the calyx cup. Here is the important thing to remember in controlling the apple worm. Eighty-five to ninety per cent of the codling moth larvae enter the apple through that calyx cup; if you have that cup filled with poison, you will kill them as they take their first meal. The second brood, which come out the last week in July in this country, I should judge, depending upon the season, will enter the apple just as well from the side or stem end and also at the blossom end; where two apples are joined; or where the apple is against a leaf or limb of any kind. About the 25th

to the 31st of July you should spray your apple trees again for the second brood of codling moth, for this second brood really does the greatest damage to the marketable crop. The first brood causes what we call the June drop, but frequently they do not do as much damage as one would think, because they frequently prevent the overloading of the tree. The second brood infests the apple that we want to put upon the market, therefore we should be on our guard against it about the 25th or 31st of July.

The plum curculio will do some damage, but I have not seen effects of very serious injury in the orchards so far. A thorough spraying of arsenate of lead just as the buds are swelling in early spring, in conjunction with lime sulphur which will control fungous diseases, is very desirable. This will kill the plum curculio which hibernate around fences, under grass, in debris of various kinds, around forests, or wherever there is a large gathering of leaves. They come out in the early spring and feed on the green bark of the twigs, and if you have them coated with arsenate of lead you will kill many hundreds.

Right now you have in your midst a quite serious pest, the apple aphis, which is very abundant in some places and which curls the leaves. The best remedy is some contact wash like kerosene emulsion, nicotine spray or tobacco wash, but you will get better results in using the nicotine spray and tobacco wash if you will use it combined with whale oil soap suds. It seems to do more efficient work and is more effective. Somebody asked me about making a tobacco decoction. They said they had been told by some tree agent that had come in recently to make it by taking a pound of tobacco stems and putting it in two gallons of water and boiling it for two hours. The fact is that if you allow your tobacco stems to boil you lose the nicotine. Never allow tobacco stems to boil, just let them simmer and steep in a covered vessel, because the nicotine passes out with the steam and you lose the strength. Use one pound to two gallons of water, then dilute it and use it in connection with whale oil soap.

The cutworm has been abundant in various parts of the state, but I understand has not been very abundant here, nor very destructive.

The white grub has been with you at various points. We know of no remedy for this pest but we have to use preventive measures against it. Thorough cultivation of a field in the late fall, or summer plowing; continued cultivation of infested fields will check it by simple starvation methods.

The house fly I want to speak of, although no horticultural pest, yet it is necessary to call attention to it on account of the great danger in permitting the house fly to enter your house and attack the food. It has been thoroughly established that the house fly carries a multitude of diseases, especially those affecting the alimentary

tracts, including typhoid fever, dysentery, summer complaint, cholera infantum and many other children's diseases. House flies will breed in various kinds of matter which is allowed to decay, particularly in horse manure about the stables. That is one thing that should be removed and spread out on land at least once a week. It is perfectly obnoxious to see the amount of various kinds of stable manure that is allowed to lie around and decay and attract house flies. Not four blocks from this building are at least forty loads of manure decaying, and I venture to say that as high as 100,000 flies may breed out of that place every week. The fly is the filthiest insect that we have, throughout its entire life history, and I want to impress upon you the importance of keeping that fellow out of the house by means of traps and poisons, more particularly by cleaning up all kinds of filthy places. When we know that typhoid fever is carried quickly and rapidly by the house fly, we should be extremely careful. You have had a great deal of typhoid fever in this city in the past, and I am quite sure that it does not all come from the water, but if there is one case of typhoid fever in the town and the offal of that place is not taken care of properly, the house fly will visit it and carry it to other homes at some distance.

Coming to another important point; I know of several land companies, not only in this state but in other states, that are selling a great deal of your land around here that is not fit for horticultural purposes. Many of you know, as well as I, that not all of the land in this county or in some adjoining counties, is fit for horticultural purposes. Four or five miles from the lake is the limit. If you permit companies to advertise and sell a lot of that land as Bayfield fruit land to people who invest a lot of money and make a total failure, your country will get a "black eye." The best thing you can do is to publish in your papers and spread broadcast the fact that there are certain lands being advertised that are not horticultural lands. I know of certain companies that are advertising land 10, 15 to 20 miles from the lake, representing it as Bayfield land, which is not Bayfield land in the true sense of the word.

There are at various times during the season various agents coming in here making misrepresentations of their stock. That is the very thing we have been trying to drive out of this state. We have succeeded to a remarkable degree, even beyond our fondest hopes, yet here and there some fellow creeps in and causes some mischief. You had an agent here during the last few months who made some remarkable representations in regard to his stock, and induced people to buy stock at two or three times the normal price. He represented to many people that he was selling cherry trees grafted on pin cherry roots; said they were hardier than any other, and you should buy only of him. That statement was entirely erroneous. I wrote

to his company to determine whether they used any pin cherry in cherry growing. They informed me that they used the Mahaleb stock that other nurserymen use. If any one is dissatisfied with the contracts made with that agent through misrepresentation, the contract is null and void and you are not required to take the stock at all; he cannot force you to take it if he has misrepresented the stock to you in any way, particularly with reference to cherry trees. His cherry trees are no different from any others, and representations that they were grafted on pin cherry roots are entirely wrong. One of the duties that I have been trying to perform in the state is to eliminate those concerns and agents that are trying to impose upon the grower. We are trying to keep out the insect pests as far as possible, including the dangerous San Jose scale. We are also inspecting all importations of stock from Europe, because we are afraid of introducing browntail moth and gypsy moth, and many other insect pests known in Europe that have not yet been imported here. If there are any questions along these lines, I shall be glad to answer them.

The President: I should like to have you give the formula for fifty gallons of tobacco and whale oil soap for the aphis.

Professor Sanders: In using the nicotine preparations I think it is generally advisable to purchase that which is prepared by the companies in commercial quantities, although you can prepare it from tobacco stems, but so frequently failure follows efforts on the part of people to use the tobacco stem decoction, I think it is better to use the commercial nicotine preparations and make a reasonably strong whale oil soap solution, perhaps using three or four pounds of whale oil soap to a barrel of water, rainwater or soft water, and then use about a pint of "Black Leaf 40," or perhaps a quart of some of the weaker decoctions. Follow the formulas on the different preparations, some are stronger than others, but about one part of nicotine to 500 parts of the soapsuds solution is advisable. You must be governed by the strength of the nicotine, or directions on the can.

Mr. Richardson: How do you fight strawberry leaf roller?

Professor Sanders: That has been a serious pest in some localities and is best fought by spraying. Arsenate of lead has been very successfully used this year, and is the generally advisable method of fighting the pest but you must start early in the spring and keep at it, if the infestation is at all serious. Spray every new set of leaves that comes up, every ten to twelve days until the leaf roller has been eliminated from the field.

Mr. Richardson: You would have to follow up until the second crop matures.

Professor Sanders: Yes, you have to follow right along, because every new set of leaves affords an opportunity for the leaf roller to

work, and after he has gotten in his work to a certain degree and folded the leaf over, it is hopeless to try to reach it, because they fold the edge of the leaf and fasten it down with silk so you cannot get the poison inside. They never come outside of that folded leaf but feed from the inside.

Mr. Richardson: Is it not true that there is only a period of 48 to 70 hours from the time they come out until they have that leaf sufficiently folded to be protected?

Professor Sanders: I am not certain as to the exact time, but they are pretty fair sized before they fold the leaf over, four to six days old.

Mr. Richardson: If a man has four or five days, he can get at it with the arsenate.

Professor Sanders: Yes, he has fully that time, even after the egg is laid, I think a week elapses after the egg is laid and the larva turns the leaf over, you will find most of the larva as large as a knitting needle or perhaps as large as the lead in the pencil before it turns the leaf over.

A Member: What strength of arsenate solution do you find advisable?

Professor Sanders: Not less than 3 lbs. to 50 gallons, four is better on any of the low growing crops. I think four pounds of arsenate to 50 gallons is more satisfactory than weaker solutions.

A Member: Then do you run your Bordeaux mixture right in with it?

Prof. Sanders: Well, you could do that, but those two do not work so well together as Paris green and Bordeaux.

Mr. Richardson: Is there any chemical reaction that you can see?

Prof. Sanders: Sometimes there is and sometimes there is not; sometimes good results have been obtained and again it has turned to a dark solution. I have seen it both ways.

Mr. Richardson: Normally, should there be any chemical reaction?

Professor Sanders: Generally there is some chemical reaction, but it is seldom sufficient to cause any harm.

Mr. Richardson: If you are going to mix the two, do you use the attenuated solution instead of the concentrated?

Prof. Sanders: Always. It is better to mix anything like that in the attenuated form. You should not mix arsenicals with the stock solution of Bordeaux.

A Member: Would arsenate of lead, four pounds to fifty gallons of water, burn the leaves without lime?

Prof. Sanders: No, that is one of the advantages of arsenate of lead; it will not burn the foliage if it is a good brand. If it con-

forms to the state law passed a couple of years ago, arsenate of lead will not burn foliage. Paris green has a certain portion of soluble acid which will burn the foliage if you do not use lime with it.

Mr. Holstein: Has it been your observation that the bull wasp, or hornet, plays upon the aphis?

Professor Sanders: I do not know the exact one to which you refer, but there are a number of smaller bees which do kill aphids and store them away. Sometimes you will find on the common sumac twigs cells filled with fifteen to twenty aphids and an egg of the bee, that will be capped over with cut leaves, then there will be another cell, until you have ten or a dozen frequently, and perhaps 500 or 1,000 aphids collected in one twig.

The President: Is there some chemical action in mixing lime-sulphur with arsenate?

Professor Sanders: There is sometimes chemical action.

The President: Is it considered a good mixture to use? Is it not almost impossible to keep the mixture sufficiently agitated to spray it out on the tree? We find considerable trouble.

Professor Sanders: Sometimes a precipitate forms which may prevent your getting the best results in the use of the combined spray of lead arsenate and lime-sulphur unless severe agitation of the material is kept up and that is not always prepared for in the manufacture of many pumps.

A Member: Would it be possible to find an insect enemy that would control any of these pests?

Professor Sanders: No, I do not think that is a feasible plan with any of our insects.

A Member: Can the beetle that produces the white grub be attracted to the light and destroyed?

Professor Sanders: Yes, it can be attracted to the light quite readily, and I do not know but finally we may have to resort to some such plan to control the white grub, but it is not best to try any such method on our leaf rollers or any small moths, because they can be controlled with spraying and the spraying is efficient, not only for those, but any other leaf eating insects. There are two or three weevils that affect the strawberry that can be controlled by spraying. I think it is always safer to spray the crops; it controls a number of insects, and prevents them from multiplying.

A Member: Are strawberry plants inspected before selling?

Professor Sanders: Our state laws require that all strawberry plants offered for sale must be officially inspected for insects and diseases. There is a root louse introduced into our state at various points from Michigan, Illinois and adjoining states. We have found it in a number of places, and in several places we have been able to eliminate it entirely by plowing up the old beds and starting new

Pink Lady Slipper

A Daisy Field

beds. The presence of the root louse is best indicated by many ants which work around the base of the plant, attracted by the aphids, and often carry the plant lice from plant to plant and take care of them. We find the infested plants by watching the ants, then by pulling up the plants we will frequently find the roots of the plant covered with dark green plant lice. They are most abundant and do the greatest damage in sandy soil. We rarely find them in any quantity in clay soil.

A Member: How would you protect trees against the rabbits?

Professor Sanders: The best plan would be to repeal the present state law protecting them. The best protection is to cover the trunks of your trees with wood veneer or something of that sort. Corn stalks can be tied around. There is nothing that has been found which is a thorough protection in the way of a wash that can be applied to the trees, although many companies advertise some bitter preparation that they will sell you at a good profit.

A Member: How do you protect against mice?

Professor Sanders: I wish I knew. Mulching the trees with any kind of grass or hay or straw is more likely to cause damage by mice than with clean cultivation. The old method of whitewashing trees is not as foolish as it seems to many people. It protects the trees from borers to a certain degree. It does not hurt the trees at all.

A Member: Does tramping the snow help against mice?

Professor Sanders: Yes, that will help to a considerable degree if the snow is damp, piled around the base of the tree. That would be a considerable job with a large orchard, but would be worth while if you found damage was being done.

The President: Last night we had a paper here on the absolute necessity of cover crops in the orchard. Now the question comes up here about the mice and you say mice are not very apt to affect an orchard that is in clean cultivation. Those two do not work together.

Professor Sanders: They do not work well together.

The President: We have heard a great many people advocate mounding trees to protect them from mice. Usually it is alright. Once in a while the mice will work up in the snow.

Mrs. Howlett: In case the trees are girdled, is there any way of saving them?

Professor Sanders: There is a method by which you can save them known as bridge grafting. It is rather tedious, but if the tree is valuable and is not too severely girdled, it may be worth while. Make a clean cut around the girdled place; take small twigs, cut them down to a knife edge and insert them above and below the wound, carefully bringing the bark in contact at the end of each twig. You could put in a number of those and perhaps whitewash

over the spot, or give it a coat of paint, covering up the exposed wood and wrap it. Sometimes the trees will recover and the bark grow over it, but it is rather tedious to go over a lot of trees that way. Sometimes it may be worth while.

The question is asked why only a portion of this Bayfield peninsula land is available for horticultural purposes. If it were not for Lake Superior you would not be able to grow fruit up here at all, that is, many of our larger fruits. It is the influence of the water controlling the frost in both spring and fall which enables you to grow fruit here. Now, the influence of the water which is strong enough to affect apple growing or larger fruit growing does not extend very far back from the lake. In some places the area that is affected is broader than in other places and that must be taken into account. For instance, you may find a place where it extends only a mile or two up some high ridge and back of that sharp ridge you may get frost a week earlier than on the water front. In other places that region may extend back six or eight miles, but rarely. It is not safe to count on any more than five or six miles at best in many places. Of course when you get out on one of the islands about here, where you are surrounded by water, then you have a tremendous influence exerted by the water both in the spring and fall. Many people cannot understand why water has influence on fruit growing. As I came up from Marshfield the other day I saw many places where they have had heavy frosts many miles south of Ashland but there has not been any frost here and perhaps will not be for three or four weeks. That is the controlling influence of the proximity of water.

A Member: Can you get too close?

Professor Sanders: No, you cannot get too close to the water. If you are reasonably close to the water, on soil that is adaptable to fruit growing, you will be perfectly safe.

A Member: On low land, too?

Professor Sanders: No, not exactly low land. You must choose your soil every time for fruit growing, and good air drainage is highly desirable.

A Member: Going back to the subject of mice, would lime-sulphur applied heavily to the base of a tree have a tendency to discourage the mice?

Professor Sanders: I think lime-sulphur used pretty strong in connection with a heavy whitewash would be more effective than whitewash alone. It could be painted on the trees and would have a tendency to discourage the mice. But when mice get very hungry in the winter they will attack almost any tree or plant.

A Member: How would heavy tar paper do for protecting the tree body in the winter?

Professor Sanders: I would never apply tar paper to a tree, especially closely to the tree. There seem to be chemicals in tarred papers that frequently cause burning of the bark. If you take the common felt paper something like that used for deadening floors under carpets, it might be applicable, but I would not put a tar paper immediately against a tree, because sometimes serious injury results.

Mr. Richardson: Then the untarred building paper would be all right?

Professor Sanders: That would be all right to a certain degree, but I like wood veener, or something like that that will not apply tightly to the bark. We do not want anything that will lie absolutely against the bark. Better have it loose.

A Lady: We have had good success with burlap, tying it rather loosely, spraying over the burlap, leaving it there till the burlap decays.

Professor Sanders: It is possible that the burlap permeated with the spray has been a protection to a large degree.

A Member: Do you injure the tree by leaving the wood veneer for several years?

Professor Sanders: Not unless you get it too tight, so that it cuts into the tree.

A Member: What about the flat-headed borer?

Professor Sanders: You can protect your trees from the flat-headed borer, which is perhaps your most dangerous enemy to young trees in this country, by a thorough application of thick whitewash in spring and keep it well whitewashed each year.

A Lady: We have had good success in killing mice by soaking wheat in strychnine and placing it around the trees where the mice will get it.

A Member: Do mice bother cherry trees very much in the winter?

Professor Sanders: They do not seem to bother cherries as much as apples, on account of the bitter bark of the cherry.

TRANSACTIONS

OF THE

Wisconsin State Horticultural Society

WINTER MEETING

January 8, 9 and 10, 1913.

WEDNESDAY MORNING, January 8.

The meeting was called to order by President Bingham at 2.p. m. in the Madison Free Library, Madison, Wisconsin. The President introduced C. P. Cary, State Supt. of Public Instruction.

ADDRESS BY MR. CARY.

Mr. President, Ladies and Gentlemen:—I do not know why I have been called upon to-day, unless it is for one of two or three reasons. One is, my ignorance of the subject, so that those who come after me may appear more brilliant. Another is the general good will of the people who are kind enough to wish to do me an honor now and then.

While I know very little about the subject that you people are chiefly interested in, I do know something about its results, something about its outcome. I no not know a great deal about the process, but it is the outcome that a great many people are interested in, in other words, the fruits, both figuratively and literally, that come from your study and labor.

I am especially under obligation to your society and the officers for the attempt in the last few years to help us in the matter of decorating school grounds. It was very kind indeed of you to undertake to do something in that line. We have been trying in Wisconsin

for a long time to improve the school grounds of our country schools. In the first place, those grounds are entirely too small as a rule. Every year we send out an Arbor Day Annual, as it is called, indicating how trees may be planted, and what kind of trees and shrubs and various kinds of plants are good for school grounds, and yet the thing moves very, very slowly.

You will agree with me, I am sure, that most country school grounds are exceedingly barren and uninviting places. I speak of your interest in this because I am more familiar with this perhaps than any other phases of the work which you have undertaken, although I am aware that this is just a minor and side issue with you. It is not so with us. But the grounds in our country schools are anything but beautiful at present and anything you can do to help will be appreciated.

There is a county superintendent over the state line, by the way, who has done a great deal in the way of stirring up his people to look after the planting of trees. He has an illustrated lecture, stereopticon, and as he goes about and delivers that lecture he throws upon the screen the school grounds, and then alongside of that he often throws on a screen the yards of some of the more prosperous and thrifty and painstaking farmers and the contrast is really something very painful, something very much to the discredit of the school grounds. He will take a stretch of road with some beautiful trees, perhaps, or a little grove and, throw that on the screen for the admiration of everybody, and then he will throw on the screen another school ground barren of trees, or an old scrub of a tree, perhaps, not a thing growing on the ground, and in that way he has been able to educate his people. To some extent we have been doing some such things in this state. We have in that particular a rather difficult problem, which I think your experience and your ability in tree growing will help us a great deal in solving. Our children ought to have the beautiful around them.

One thing a child goes to school for is to come in contact with superior personalities. I say, "superior personalities," you understand what I mean, I do not mean that the teacher is superior, necessarily, to the parent. Many times the teacher is sadly inferior to the parent. But on the whole, according to our theory of the way things ought to be, the teacher is more thoroughly trained in the use of language, she is more careful in her personal appearance, she is more courteous than the average run of people. If she is not, she is scarcely the sort of person that ought to be brought in contact with pupils. You will understand, of course, that I do not mean a teacher should be an extremest in fashion, or a man should be a fop, anything of that sort at all. I believe in womanliness and manliness and character.

If we could make our surroundings of the school grounds beautiful, it will remain in the minds of our children as long as they live as one of the pleasant things in their early childhood, the school with all its beautiful surroundings and its appropriate setting. But the memory that many of our children are likely to bear about their country schools is very different from that.

Now, coming a little closer to this subject in which you are immediately concerned, I am telling you nothing that you are not aware of when I say that the people of this state credit to this Society a great deal of excellent work in the way of increasing the amount of fruit grown, and improving the quality of the fruit grown in the state. I think your Society began some fifty years ago and with various ups and downs it has continued up to this time, perhaps never very large, but none the less efficient.

There is one respect in which we are reaping the reward or benefit of your labors. As time goes by, more and more the medical profession is going to say to people that it is necessary for them to put into their diet more and more fruit. They are coming to that point of view, that the acids of the fruit, the various juices of the fruit are excellent for the health. It is becoming a necessity, not merely a luxury, to have an abundance of excellent fruit. Your labors, I suppose, are largely in the direction of showing people what can be done in the way of growing fruit here commercially, and of course your labors in that direction are not over. You have a great work, it seems to me, to get the average farmer who does not grow fruit for profit, but merely for his own use, to do more and more in the direction of having proper fruit trees and small fruits than has been done up to date. I am very sure that the great majority of farmers are not doing what they might do in the way of raising choice fruits for their own table use.

There is another phase of this question that I think perhaps your Society has not yet given any great amount of attention to, but I think as time goes on you probably will, and that is the growth of vegetables. You may have given more attention to that than I am aware of, but there is a great field here, both in the direction of profit and use, more particularly in the direction of the farm gardens and the gardens around the smaller towns and cities. Many people might raise a splendid little garden patch in Madison, for instance, which they fail to do. They might derive health and profit by reason of producing their own supply of garden vegetables.

Another thing is the flower side, all three things come under horticulture, but I think, with the exception of the gentleman who sits before me, who is known the country over as a raiser of pansies of the most splendid varieties, and a few others like him, I think the matter of careful growing of flowers is rather neglected in our

state. It seems to me that those two features of horticultural work should be in future much emphasized by your Society.

You know far better than I that we have in the main here a splendid state for the raising of fruits. I think one of the things that becomes evident as we think about the products of the soil, one of the things that must impress us all is this fact, and I will explain what I have to say by a little story of an actual occurrence. Down near the Atlantic shore there was a tract of ground that was quite level and very fertile, but just back of it on the bench or upland there was a tract of land that was unfertile, nobody could do anything with it to amount to anything. One day a man came along and he saw that soil and he said to himself, "I think that we could raise the kind of melons here that they raise out at Rocky Ford in Colorado." You remember what a splendid melon was developed out there that was found in our first-class cafes all over the United States a few years ago, sold at high price and was an excellent article. So, this gentleman started on this piece of land that never had been able to produce anything and raised Rocky Ford melons of the same kind. It was close to the East, no end of market, he was able to make splendid money out of that land, and that became more or less of an industry there.

Take our own state, here around Chequamegon Bay they are beginning to raise splendid strawberries, and they are going to ripen at a time of year when strawberries elsewhere are passing away, an excellent quality they are raising there, and around Ashland they are developing lands for the purpose of raising strawberries. You know how it is in Door county; land regarded as practically worthless in many cases makes the best cherry orchards, and as time goes on I think we shall find that all over the face of this earth there are to be found spots that up to this time are considered practically worthless that will be of splendid usefulness in some one direction when we learn what that direction is, something that is immediately marketable and profitable. We do not know yet what to do with old Mother Earth. We know in a way, that is, within certain limitations but we do not know fully.

I will close my remarks by just one illustration, and what was true in this particular thing is true in fruits, no doubt. I lived for some years in Nebraska, and while living in that place along about 1890, I had as one of my best friends a physician who had a great deal of practice out in the country, and when I was not teaching school, that is, on Saturdays and sometimes on Sundays, sometimes at night, he would invite me to drive out with him into the country while on his professional trips. I was very glad to do it, fresh air, good company, and so on, but there was one thing that was a distressing fact to me, namely, that the farmers were exceedingly poor,

they had seemingly very little to live on. They could not pay their debts, could not pay their doctor's bills, could not pay their grocery bills, they had poor stock and poor houses, their children were ragged and their schools were poor, everything was in a run-down condition. Now, that was not because the country was old and had been worn out, or anything of that kind. It was a comparatively dry climate and they did not know what to raise out there with success. Some years they would have very good crops, some years they would not. When I left there about 1893 they had had several years of exceedingly bad luck and everybody nearly starved to death. Some people moved away, could not stand it at all, but those who remained started in very soon after that to raise alfalfa, and they found they could produce several crops a year—splendid, heavy crops, and the hay sold at a high price. A few years ago I was back in that same community, and I went with that same doctor on a drive out in the country again, and I was amazed at the change. The farms were in the finest shape; here was a barn that had the most modern improvements, here were fine cows and good stock of all sorts, and these men had their automobiles and they had their bank accounts and they were sending their children to college and they were doing all sorts of things that they never could have dreamed of doing before, and the whole secret was that they had learned what they could bring forth out of their soil. That was the whole story.

Now, you people have done a great deal of that sort of thing, and I have no doubt you could do much more of it. I suppose if I were to ask you; you would tell me there are portions of Wisconsin that will never produce fruit to any great extent. I presume you would tell me that, and yet it may be that in ten years from now you would laugh at that idea. I cannot tell what may happen, you cannot tell what may happen, but when we come to this matter of raising fruit, or whatever it may be, that the soil is adapted to and that the climate is adapted to, we shall be successfully producing crops. Until we do do this, until we do find out what is the crop that is suited, or the fruit that is suited, we are going to fall short of the largest success.

Now, there is one thing about this fruit production that a famous gentleman in California has pointed out to us, that is; that we can rapidly change our fruits and various kinds of vegetables, any kind of growth, for that matter, we can change it almost at will. We can change, as time goes on, our fruits just as they are changing the corn and just as they are changing their various farm crops, we can change it to suit our climate, our soil and all these matters. I am sure in this respect the people of the state regard you as public benefactors when you are working largely unselfishly, incidentally getting profit out of it yourselves, but you show the spirit

of caring for the welfare of the state; and you have accomplished an immense amount of good. The state is helping you, and I hope it will help you as liberally as your needs may be, and I know of nothing that is of more benefit to the state than this work that you are doing.

REMARKS BY DELEGATES FROM OTHER STATES.

Mr. R. A. Wright, (Minnesota).—I am pleased to be here, and I am free to say that I hope to receive some good from this meeting. If you people have the start of us in Minnesota, if you have got ahead of us in any way in raising fruits or marketing the same, I am here to gain on those points and take them home to our Society, and yet I trust that I will be able to do something that will help to make these meetings pleasant and beneficial to all present.

Mr. H. G. Street, (Northern Illinois).—I do not feel as if I needed very much introduction to this Society. This is the first Society I ever belonged to, I live only a mile and a half from your southern line, just south of Lake Geneva, and being chiefly interested in securing hardiness in fruit trees, I joined your society before I did our own, also the Minnesota Society. I always like to come up and see you people up this way, especially after a hard winter like last winter. We suffered quite severely down there, not having very much snow on the ground, and the frost getting three and a half to five and a half feet deep, according to exposure. Consequently this spring the tops started out in nice shape and when the roots followed up they were dead on many trees, consequently it showed root killing. So I wrote up to your Secretary before our northern meeting and tried to get some man that he thought would do us as much good as any one could, so he arranged for Professor Moore to come down. I was surprised in reading over your last Wisconsin Horticulture that so many apparently thought that one root was as hardy as another, and it was not necessary to secure hardy roots, but I found that in the southern part of the state they had the same experience. I expect before we leave we will hear some one that will solve the question of hardy roots.

BY-PRODUCT OF THE APPLE ORCHARD—EVAPORATED APPLES.

MR. E. W. CATCHPOLE, North Rose, N. Y.

I bring you the greetings of the fruit organizations of the Empire State. While some of our organizations are somewhat larger than this, possibly they are not doing any better work. I myself feel that

our very best work has been done under adverse conditions, when our membership was very much smaller than at the present time. Conditions have favored us. Some of the members have been making money in large quantities in very short periods of time, and they are spending it very freely indeed and indulging in some of the luxuries and are not devoting as much time to the development of the fruit industry. I think there is danger of failing to realize our position in regard to competition in certain quarters. For instance, the Northwest with its enormous production of box fruit, the greater competition from Southern Pennsylvania and the Virginias, which are strong competitors in the line of exportation.

Taking up the topic assigned me, I think it just as well to analyze some conditions in the apple-growing industry before going into the by-products. Many of you know the enormous plantings in the Northwest, with only 10 or 12 per cent of the plantings now in bearing. You have a general idea of what that crop is worth now, there is hardly money enough left after paying all charges f. o. b. This great expansion is true of Western New York, it is true of Southern Pennsylvania, it is true of the Virginias, way down through to the Western Carolinas. Fruit trees are worth more money in North Carolina than they are in the Virginias or New York State. Then too, the sections referred to, especially those from New York State south, I think are giving better care to their orchards than are the people in Western New York. They are giving more attention to packing, the states themselves are spending more money, sending out more men to instruct in the profitable growing and packing of fruits than is New York State or any of the Mid-West States at the present time. These things must be considered in the very near future. To-day the price of barrel apples is very close to the cost of production under the present methods as adopted by the up-to-date apple growers in Western New York and the sections referred to further south. These things are valuable to you people here in this state, as I understand your conditions where your orchards are comparatively small, where there is comparatively little commercial growing, where your overhead charges are not as great as in these specialized sections and chances to produce a fair grade of apples for less money than some others perhaps are producing them. This is one viewpoint, the opposite viewpoint, the argument generally used in regard to growing better fruit, being able to grow more fruit of which a large per cent will go into the barrel. (As to methods there is quite a difference of opinion among prominent growers, one very large grower in New Jersey taking the view that weeds are nothing more than a cover crop and it does not cost $15 a bushel for seed as is the case with clover. With high prices for barrel apples, the argument that one should use the very best care, the best

orchard methods, liberal fertilizing, spraying, proper pruning, cultivation, if necessary, and the growing of this high grade fruit followed up in many cases now in the orchard sections with hand-thinning, removing of the lower grade of fruit, that would otherwise be used up in the evaporator or cider mill many feel that that is the ideal method of growing apples at the present day. Personally, I feel that hand-picking should be considered as a regular orchard operation. I think it is a good investment, that is, if you are going to play the game, play it to the limit. But we have men in Western New York, as there are in other sections, who are growing just a fair grade of fruit which is not good enough to barrel, which goes to the canning factory, or the surplus goes to the cider mill or evaporator. Some of those men I must admit, although I am a large grower, have been making a fair amount of money upon their investment and not doing any worrying over it. They do not feel a hail storm, it only means a little less money to them out of their money invested there.

Now, in regard to the amount of the product of the evaporator, the value of the fruit handled in Western New York by the Western New York Fruit Dealers' Association was, in round numbers, $9,000,000. A large part of this was exported, 50 per cent of the exportation goes to Germany, about 33 per cent to the Netherlands and the remainder is scattered widely. The price of evaporator fruit has its cycles of ups and downs. Unfortunately just at this time we are on the down cycle, the cost going down to four cents per pound. The last period of low prices occurred in 1896, when the lowest price went down to three cents per pound. During the intervening period prices have been such as to warrant a fair product and sometimes a large one. Last year the price jumped to an advance of over two cents per pound. The unfortunate condition right now is this, the product of the evaporator has been used as is the stock market in New York City, for gambling. The fever started in a small way among local producers and growers back in the early '90s, and they had a lot of fun out of this game, it extended to the large dealers, to the jobbers of New York, and last year our German friends took up this form of amusement, with the result that at the end of the season there were 300 cars of evaporated fruit in Germany beyond their needs, quality none too good, they were carried over in improper storage, and a very small portion of them fit for human food when the spring campaign opened, leaving a surplus there and our German friends very much prejudiced against the entire business of evaporation. Naturally, in the course of trade these conditions will right themselves, the element of speculation is being eliminated to a large extent in this country, and the influence of the organizations is toward a better grade and increased consumption. In 1896 and a few years following, the product was very low in grade and consumption was materially less-

ened which resulted in the state of New York passing a law decreasing the amount of moisture which was permitted in the evaporated product, 27 per cent, which at that time was supposed to be low enough so that the product would keep reasonably well through one season, and other conditions were also changed somewhat to improve the product to the end that consumption was again stimulated and the trade was going along very nicely until this unexpected drop in prices occurred last fall. I think those who have been in the industry longest, especially the dealers, believe that there is still a fairly good future for the process of evaporation.

The matter of evaporating should be considered in relation to the disposal of other products of the orchard, or the other methods, the first and easiest of course being the cider mill; next in order the evaporator, and the canning factory and the barrel. To give you an idea of the range of prices in the commercial sections in Western New York in the past fall, the bulk of the cider apples were sold from the orchard at 25 cents per 100 pounds, the product of the evaporators, 25 and 30 cents per 100 pounds, and the canning factory paid from 40 to 60 or 70 cents per 100 pounds, the highest price being for big apples. In grading the cider apples, there were to be no knots, but no limit on the size. The evaporators and the canning factories are both insisting on nothing less than 2 inches in diameter. This will give you a rough idea of commercial values under the existing conditions of the past season. I think the safer way where the product is sufficient, is to combine either a cider mill with an evaporator, or with the canning factory. The canning factory people, as far as grade is concerned, have lowered their grade, so that there is very little difference between the grade of the canning factory and the evaporators. While the drop in the canning factory has been greater than the drop in dried fruit, yet I think the greater surplus will be carried over from the canned goods. You will naturally infer from the lower price conditions in Germany, that the tendency has been to reduce this season the total amount of the evaporated product. Evaporators were very slow starting at the beginning of the fall campaign, bought very conservatively and in some cases closed early, made a very short run as against the old plan of making heavy contracts, selling futures and buying freely. The labor problem I think is fully more serious with canning factories than it is with evaporators. Conditions in the canning factory are not as desirable for the operators as in the evaporator. Perhaps some of you may know that those matters have been stirred up lately in our own state in the way of legislation during the past four months, articles have appeared in the magazines as to the condition of the canning industry in the state on account of the canning factories being exempt from the law passed a year ago as to the employment of women oper-

ators for more than sixty hours per week, and allowing the employment of child labor with no restriction clause.

Taking up the matter of the process of evaporation first, it dates to my early boyhood. I happened to live in one of the fruit countries of Western New York between Rochester and Syracuse. So far as history goes, the first commercial transaction in this product occurred by sending on a wagonload of dried fruit from my own county eastward into Jefferson county, a dairy section, a distance of something like sixty miles, and a team bringing back a load of cheese, purely a barter proposition in those early days. That fruit probably was a sun-dried proposition, stringing those apples in quarters around the kitchen stove. Then soon followed the making of those very small evaporators with a capacity of from 5 to 15 bushels per day, which was usually operated out-of-doors, occasionally in the summer kitchen or woodshed, the labor performed as a rule by members of the household for probably twelve to sixteen hours; each farm perhaps had one of those and the members of the household as time permitted kept these driers going and brought in some extra money for buying a winter supply of clothing and some of the pleasures of life. This style of evaporator was used for some little time, but was gradually replaced by two distinct types of plants. The one a long horizontal box, four feet in width on the inside by six feet in height and from 16 to 20 feet in length, a furnace underneath one end, a very large furnace with the pipes running back through the entire length. The fruit was placed upon wire racks upon horizontal runs in this box, first placing this rack, the width probably two and one-half feet, on the lower run directly over the furnace, thus getting a high heat at the start, and each rack was inserted and these were pulled along and each one in turn was exposed to the heat and came back and the racks were kept going back and forth on these runs until sufficiently dry for the racks to be removed. That was called the box drier. It was cheaply built and quite easily operated. Its great drawback was that under certain damp conditions of the air, the entire apparatus would be just one mass of super-saturated air, and it was practically impossible to do anything, only keep the racks moving. The other type which came in about the same time was the brick tower, composed entirely of brick four feet square on the inside, with the furnace at the bottom. Into this, racks were introduced at the bottom directly over the furnace and raised and room made for the introduction of another rack by the system of either a ratchet wheel or long lever and the fruit taken off when it got dry enough further up in the tower. The tower plan was far more expensive, it was necessary to have a building two stories in height and all that brick work and it was really harder to manage in this damp weather than the box.

Then shortly after came the third type of evaporator, the hop kiln. I have here, if you are able to see them, a plan of the hop kiln. The hop kiln plants are made in units, in the kiln itself the unit being 16 by 16 feet, 18 by 18, or 20 by 20, or certain modifications. The 20 by 20 square is now considered to be the best type. These plans represent the three-kiln outfit which has now been standardized for being the best of its size when worked down. This represents on the left the three kilns in the row, with a large furnace in the center below in the cellar ten feet at least from the bottom. The floor on which the fruit is placed consists of a series of slats, V-shaped, one-half inch on top, one-quarter inch below, which allows the hot air to come up through the slatted floor, up through the ventilator and out through the opening. This represents the three furnaces in a row and this side arrangement represents the furnace with the pipe.

DISCUSSION.

Mr. Toole: I take it for granted that whether any particular locality engages in disposing of its products in this way depends on the amount of products which they have that they wish to work up in such way, making cider or drying apples. I should like to ask in regard to one of these commercial concerns, what is the smallest amount in bushels that they can make use of and they think it worth while.

Mr. Catchpole. There is a very wide range there, because it depends largely upon how the furnace is fired and how fast apples are placed in there, how much it is crowded. The maximum capacity of an 18-foot box drier I think is about 60 bushels, a 60-foot box, old style box. Of course we regard that as a little bit out of date now. In the power driers, under favorable conditions they were able to put 200 bushels through one of those 4x4 driers, with crowding, under very favorable weather conditions. Coming to the matter of the hop kiln, the standard outfit as diagramed here, the capacity of a four-machine plant is about 250 bushels per day. I would not build anything smaller than that, 50 bushels. As to the cost, the diagram represents a cost of about $2,000. That can be increased to four kilns with only an additional expenditure of $500. The gasoline engine runs it, the same working room is sufficient, it is only necessary to have a longer working table and two extra paring machines and the one extra kiln. But the best thing for you would be the single kiln, 16x16x20; that would be the easiest for your conditions here in certain localities. Some localities might take two kilns, hop kiln style, some three. There have been more evaporator fires in Western New

York this year than ever before, simply have been cleaning them out in a wholesale way. Up until about three years ago very few reliable companies would carry that insurance. After a lot of losses and unable to get insurance, two or three companies were found which were reliable and responsible and would pay losses, but there is a general feeling among evaporator men that it would be absolutely impossible to get more insurance unless it be on an up-to-date construction with either hollow tiles or cement block construction.

A Member: You speak of evaporated parings; what becomes of that product?

Mr. Catchpole: Those have been exported to France in very large quantities. As we understand, those are manufactured into a high grade, high-toned champagne, returned here and some one pays a good price for it. During the past three years, with the very high price for the lower grade apples, quite a quantity of waste products have been used for vinegar, but at the present time we have a state law passed, possibly a federal law, against the using of that for that purpose.

A Member: What is the weight of the evaporated fruit from a bushel of apples?

Mr. Catchpole: With the winter fruit in Western New York, a conservative estimate would be 6½ pounds of the white apples, and about three pounds of the waste product. That would be an average for a season's run. Different varieties vary somewhat. It was supposed for a long time that the Ben Davis would not make as many pounds per bushel by weight as some other varieties. Now the evaporator men are eager to get Ben Davis for two reasons; they really think they get as many pounds per bushel, it is a better keeping variety, makes whiter stock and is liked very much by the dealers.

Mr. Rasmussen: Are the evaporators used for any other fruits than apples?

Mr. Catchpole: Not commercially. The large plant referred to, the De-hydrator, is said to evaporate any product heard of almost without exception. I saw their exhibit at New York four weeks ago. It was a very comprehensive exhibit of fruits, pineapples and all sorts of products. Their argument is that their plants are available for other commodities, other things are available. It might be possible to operate it twelve months in the year as against the few weeks in a year under the old plan of evaporator.

Mr. Toole: I think we are all very sorry that we could not have a man to talk to us about cider and cider products. My neighbor insists that there is no market for vinegar, and they say they do not dare to make it and sell it, because some day some inspector will come along and, no matter how good it was, so far as being good

cider is concerned, if it does not meet some acid test they are liable to a fine. I should like to ask Mr. Bassett if he knows of any such difficulty, that we are likely not to find any market for good cider vinegar unless it is up to standard?

Mr. Bassett: The law requires 40 per cent test. I find a little money on the cider the way I make it. I have got to peddle it to get rid of it. No storekeeper will buy any in our locality, but that is just an excuse that they will send their money somewhere else for other stock. I have no trouble with it. I test all mine, a test only costs three dollars, you can soon test it if you have 15 to 20 barrels, and sell it to the farmers in very little time.

Mr. Toole: Is the test required just a test of strength?

Mr. Bassett: Just a test of strength. The evaporation on the cider is too great where they make it commercially, they have one-third water, have the same strength that we get with the pure stuff.

OUR IDEALS AND AIMS.

WILLIAM TOOLE, Baraboo.

If we would reach to any high standard of attainment, whether as individuals, organized communities, or associations, we need to have definite ideals of conceptions of what we would reach up to. The name Horticultural—adopted by our society—covers much broader ground than the mere definition of garden culture. In looking over the published proceedings of our society we realize that in the past we have given attention to all the various phases of horticultural knowledge, whether in fruit culture, raising culinary vegetables, or decorative horticulture—including indoor planting—and also the broader work of landscape art. We have striven for the preservation of Nature's beauties and encouraged the establishing and beautifying of drives and parks. In recollection we do not forget that our society has looked for men of character and high ideals to lead in our work. In one respect we have improved on our ways of the past. Some of our older members remember the time when discussions were not always courteous. Some in their earnestness to debate were not always considerate of others. Perhaps the removal of business discussions from the general proceedings of the society has been some cause for improvement, but we note that business, in these days is carried on in executive meetings, without jar, or friction, at any time.

Some changes have been made in our methods that may be for the better but time has not fully proven such to be the case. The time was when we thought we were doing much to promote the interests of horticulture by encouraging the formation of local societies. The

Yellow Lady Slipper

Trillium

strength of our parent society seemed, at one time, very much sustained by the membership of these local societies, now the older societies seem to be passing away, but we have many of the workers that were derived from them, yet we miss their delegates to our meetings. There are so many organizations of various sorts in rural communities that perhaps it would be more difficult now than formerly to find localities where any considerable number of persons would care to give leading thought to considerations of horticulture.

Perhaps what is now needed to adapt our useful activities to changed conditions, is the establishment of auxiliary societies, in special lines of horticulture, as was indicated in last year's discussions following the charge that some special interests have not received fair attention by our State Horticultural Society. Might we not with advantage have a state society, which would give special attention to the culture and disposal of culinary vegetables? Ornamental Horticulture is of great interest to our state, and a society for its promotion might include both professional and amateur lovers of flowers and ornamental planting. I am sure that the fruit men do not receive as much consideration as their interests need, even though they are so prominent in the affairs of the society. A fruit growers' association might give closer consideration than can be afforded by the state society, to questions of distribution of products, form of fruit packages, and purchase of supplies, with many other subjects of vital interest to fruit growers. These several societies might receive assistance from the state society, through speakers furnished, with even more beneficial results than are accomplished by presenting fruit talks at the Farmers' Institutes. I would not, by any means, wish to withdraw the good work done at Farmers' Institutes by our society, as by this means many are given new light on Wisconsin's fruit growing possibilities. These special societies would strengthen the interest of those who have become awakened.

It has taken many years of struggle in testing varieties, aspects, locations, and methods to prove, as has been done, that apples can be successfully and profitably grown in Wisconsin. We are glad to be able to say to the world, that Wisconsin's fruit possibilities are so good that they should be a strong attraction to home makers in our state. We are proud to be able to say that Wisconsin's fruit products materially save and add to the wealth of the state. Our society proclaims this to the world, has indicated the conditions required for success, and has sought out the localities where conditions show adaptation to orcharding. From these circumstances have arisen problems that must be carefully considered by the society. The question arises as to what extent a promoter has the right to demand the endorsement of our society for such claims as they may set up for their locality. We believe in spraying and the use of

spraying machinery and the officers of the society may have individual preferences, yet they would not think, for a moment of giving out any opinions which could be rightfully construed as the society's endorsement of any particular line of manufacture. In like manner we must have it plainly understood that as a State Horticultural Society we do not endorse the claims of any commercial enterprise, whether of lands, nurseries or manufactures.

Our members of the Executive Committee should feel that it is due from them to do something in return for the honors and emoluments of their office. Each should come to the executive meeting prepared to present ideas for the good of the society, thus helping our Secretary and the Board of Managers, that they also may do the best that can be for the general good. Time was when we had reports from delegates to other State Societies. Who were the delegates for 1911? I have seen no record of them either in the annual report of the society or of our magazine, "Wisconsin Horticulture." I think that the sending of delegates to neighbor states, and receiving delegates from them, is of great benefit to the cause of horticulture, and their reports in the past have been well worthy of being placed on record. For various reasons it has seemed as if our annual reports are not large enough. Cannot our legislature committee which we will probably have, see to it that we will have space granted by legislative enactment for the cream of the discussion? We value our horticultural paper for its usefulness in presenting subjects timely, and giving space for overflow. Being as good as it is, we feel that it is not large enough. We can afford more space by paying expenses with increasing quantity and rates of advertising. It is for us, as members, to so increase the circulation of the paper that advertising space will be more valuable, and to cause increase in use of space even to the extent of doing a little advertising ourselves. We can afford to offset each increased page of advertising with a like amount of reading matter, and when we have our greater paper, let us see to it that the editor is not short of copy.

Like the veterans of the Civil War, the old pioneers in Wisconsin horticulture are passing away. Soon such work as they have done will be forgotten unless it is placed on record. Could we not have space in our paper for local horticultural history? These records, in time, would furnish material for a general history of horticultural progress in Wisconsin.

HARDY STOCKS.

J. G. MOORE, Associate Horticulturist, U. W.

Ever since fruit growing began in the middle northwestern states one of the questions which has been foremost in the minds of the growers is the matter of hardiness. The fact that most of the varieties which were grown in the former homes of the pioneers were unable to withstand the more rigorous climate of their new location made it necessary to develop varieties which would endure these conditions. The early fruit growers of these states are to be complimented for the success which they attained in this direction, for through their efforts they have not only given the middle northwest a fruit list, but have added varieties to our pomology which have become important in other sections of the country as well.

Although much has been accomplished in bringing out hardy varieties there is another phase of the question of hardiness which has been largely neglected in the past and has not therefore advanced as rapidly toward a solution. This is the matter of hardiness of the stock. The importance of this factor in fruit growing in those regions where climatic conditions are unfavorable is brought forcibly to the attention of the fruit grower at less frequent intervals than hardiness of trunk and branches. When a season with particularly unfavorable conditions has passed, however, its devastating effects become apparent in the death of many trees which have seemingly been hardy. While this may at times be attributed to variety characteristics, not infrequently such an explanation does not conform to the facts in the case. Let me illustrate. The winter of 1911—1912 will stand out in the history of fruit growing of the section mentioned as one particularly disastrous to fruit trees. In orchards in which but one variety was grown and in which all the conditions were seemingly the same, one tree in a row would be killed while the one next to it might not even be injured. Surely variety characteristics could not be given as the cause of this condition. Neither could the environmental conditions have produced such an effect as the environmental conditions were the same for both trees.

An examination of the trees which died showed clearly that in the majority of these cases death was due to injury of the roots which had occurred during the previously winter. That root injury and not top injury was responsible for death was evident from the fact that leaf and twig growth started in the spring, but later stopped, the amount of growth being inversely proportional to the extent of injury found upon the roots. What then, could account for the facts that with the same variety, under the same environmental conditions

one tree was killed, while the other was uninjured? To the writer's mind there is but one answer—the difference in hardiness of the roots upon which the two trees were growing. Root hardiness then becomes as important as trunk and top hardiness if we are to have hardy trees in the broadest sense of the term, for no tree is hardy unless it be on a hardy stock.

Our problem, therefore, is to investigate the methods and conditions under which our trees are furnished with their root systems and devise means, if possible, which will not give us a lot of 100 trees propagated on 100 roots of varying degrees of hardiness, but on roots of approximately the same degree of hardiness. Let us observe the methods by which our trees are now propagated in an endeavor to determine how much chance we have of getting trees on roots of equal hardiness at the present time. Owing to the fact that our cultivated fruit trees do not come true to the variety when propagated from seed, it is necessary that they be propagated artificially. In doing this one of two methods is commonly used; budding, or root grafting. The principles upon which these operations are based are the same, the difference in the two being merely one of manipulation. In either case the operation consists in placing a cion of the desired variety on another plant in such a way that the two unite, forming a new individual. In budding, the plant is not moved from its original position and the cion is always dependent upon the roots produced by the stock. In root grafting the stock plants are moved and later replaced. The depth to which the grafts are set is of great importance in the future development of the tree. If planted with only the root or stock portion below the surface, the plant is dependent upon the stock for the development of the root system. If, however, the graft is set so that a considerable portion of the cion is below the surface the cion throws out roots and the tree becomes what is known as an "own" or "self-rooted" tree.

Occasionally another method is used to secure hardiness. This is known as stem or top grafting. It consists in first propagating a hardy variety in the usual way and then later on removing the top and grafting on to it the desired variety. By this method we may have either of two sets of conditions. (1) A top of the desired variety growing on the trunk of a known hardy variety which is dependent upon an unknown stock the hardiness of whose roots is not known. Or (2), the desired variety growing on a trunk of a known hardy variety which has become "own-rooted" and therefore has part of its root system from a known source, and part of it from an unknown source. It is necessary that we should get these methods of propagation of our fruits in mind so as to be able to understand the relation which the roots of our trees bear to their tops.

If the roots of our trees bear so important a relation to the tree's ability to withstand unfavorable climatic conditions, is it not desirable that we should know something about the hardiness of the roots upon which they are growing? Do we at the present time know much about the hardiness of the root system of our trees or are we possessed of the knowledge which will help us to secure uniformity in the hardiness of their root systems? I believe that a study of propagation methods will show that we are following for the most part very slipshod methods in this respect.

Let us consider first the two most common methods of propagation,—budding and root grafting; the latter developing roots only from the stock. What is the source of the root-producing portion of the plant so propagated? An investigation shows three sources of stocks for the apple, imported or French seed, Vermont seed, and home seed. These are named in the order of their importance as judged by the extent of their use. How is the imported or French seed secured? The best information available states that it is secured for the most part as a by-product of cider manufacture and the seeds therefore, of any lot may be widely variable in character. This seed has been grown in a country where the factor of hardiness as regarding cold does not enter into consideration; in a country where the pear and other tender fruits thrive, yet probably three-fourths of the trees which we grow in our rigorous climate are propagated on this kind of stock. A large proportion of stocks produced from such seed may be capable of producing hardy roots, but there is no way of foretelling how many or what stocks will prove so when the test comes.

A few of our trees, but a rapidly decreasing number, may be propagated on stocks grown from Vermont seed. Some claims of superiority might be made for such stocks, but we do not know any more about them than we do about stocks from imported seed? The Vermont seed is secured in much the same way as the French seed, while there may be some which will produce stocks of suitable root hardiness, we never know until it is too late whether the stock is hardy or not.

Does our home produced seed, which is practically a negligible factor give us a stock of known hardiness? It does not for we have yet to determine what varieties will produce hardy roots and even if we did know the fact that we allow our plants to cross pollinate freely would practically eliminate any definite data relative to the character of the stock produced. Evidently there is nothing in these methods which argues for improvement in uniformity of hardiness of root in our trees for future use.

Of the common methods of propagation in the northwest we have only that of the "own-rooted" tree left to consider. At first thought it would seem that here we have the solution of the problem. Fur-

ther consideration of the matter, however, makes us doubt whether this be true. In the usual way of handling "own-rooted" trees only part of the root system arises from the cion. We have already found that the hardiness of any root system arising from the stock is problematical. If this portion is not hardy, then it is evident that severe climatic conditions may materially reduce the root area of the tree, and must therefore, effect vitally the vigor of the tree if it does not render it unable to recover and finally result in its death. Our tree is not safe therefore if part of its root system is of questionable hardiness. It may be argued that this difficulty may be overcome by reducing, or even removing at planting time, the portion of the root system arising from the stock so that practically the whole root system is produced by the cion. Would this obviate the difficulty? Some will say that it does, but when called upon to give reliable data in substantiation of such a statement, I believe none will be available which will tell us just which of our common varieties of apples produce hardy roots and which do not. We have been working upon the assumption that because a variety is hardy above the surface, therefore the roots which it produces are hardy, but so far as the writer has been able to determine there is no body of facts to warrant this assertion, as applying in all cases or possibly even in a majority of them. Manifestly we have been jumping at conclusions and not basing our claims upon experimental or authentic data.

In recent years we have heard much about the practice of top-working or stem grafting trees to insure hardiness. The effect that such a practice may have upon the hardiness of the stem lies outside this discussion, but we are concerned with the effect it may have upon the hardiness of the roots. We have already seen that by this method either one of two sets of conditions may obtain. The first of these is a desired variety on a known hardy variety which was propagated on an unknown root. Certainly we have gained nothing for hardiness by this method as we know nothing about the hardiness of the root. The other is a desired variety on a known variety which has produced a greater or lesser portion of the root system, but this does not solve the problem for we have yet to determine the ability of the variety used as a stock to produce hardy roots. Even were the roots hardy we encounter other difficulties in this method of propagation as we find that even our hardy varieties do not always make good stocks because of their inability to make a good union with the cion, because of inadaptibility to the section where the tree is to be grown or because the cion outgrows the stock or the stock the cion.

One grower tells us that Virginia crab is the only stock which gives satisfaction and another says that Virginia is worthless, but that Hibernal is the panacea of all ills due to lack of hardiness. Probably

both are right but is it not quite as likely that a third grower will find that both are wrong and that for his conditions some other variety is preferable?

If you have followed this discussion closely and believe that the arguments presented are correct, then you will agree that instead of solving the matter of hardy stocks I have only knocked out the props by which we have been supporting ourselves, but is it not time we were discovering the flimsy structure upon which we have been building our horticulture relative to hardiness and attempt to do something to solve this most important problem?

What remedy can be offered to correct these difficulties? I regret to say that our Experiment Station men are unable to give you any immediate remedy. Some years ago the Siberian crab or Malus baccata was suggested as a remedy, but it has not gained in favor and is now little used for stocks. Evidently it has not met the demands of the nurseryman and so has fallen into disrepute.

Experiment Station men would not be living up to their opportunity or duty if they were not doing something to solve this problem. The solution gives promise of requiring considerable time so the fruit grower must not be too impatient for the answer. Two possible solutions present themselves for consideration. The first step in each is the same. We must investigate the hardiness of the root systems produced by our hardiest varieties so as to determine which may be depended upon to give us hardy stocks. A method whereby these stocks may be propagated commercially must then be found. Either vegetative propagation or propagation by means of seed must be employed and both present difficulties. The ability of these stocks to form good unions with the cions and their effect upon their growth must be determined. It is no light task that the fruit grower has placed upon his servant, the Experiment Station worker, in asking him to solve this problem.

What is the grower to do while the solution is being found? There is but one course open,—follow the best approved methods now available. Buy trees which are own rooted or top work on hardy varieties which are "own-rooted" and fervently hope these varieties are such as will produce hardy root systems.

DISCUSSION.

A Member: I should like to ask what is the action of frost on fibrous roots?

Professor Moore: It is a drying action, it dries out the roots and therefore kills the living tissue, causing it to become dessicated to an extent where the life process cannot be carried on. We usually

think of trees being dormant in the winter; that is not true, the life process is going on in the dormant tree just the same as in the tree in the summer, although not so rapidly. It is just like the bear which hibernates, he is not dead, he is simply asleep, the life process is going on. So it is with the tree. Freezing is a drying process which brings about this change.

Mr. Barnes: What is the best remedy to prevent the freezing and drying?

Professor Moore: We believe that the best remedy so far as root freezing is concerned is a mulch, and the kind of mulch we believe in is a cover crop, which not only forms a mulch in itself, but it provides the right kinds of a cover; also has the tendency to hold the snow on the ground. Not only that, but this mulch, in preventing deep freezing, it also prevents, in case you do not have snow, the drying out of the soil, which is another direct factor in drying out the root system, producing death. We use a cover crop to take the excessive moisture out of the soil, so that our tree will not keep on growing too late and go into the winter immature and thus be more subject to winter-killing.

Mr. Barnes: Would you not add a little fertilizer on top of the cover crop?

Professor Moore: No, I would not.

Mr. Street: We had quite a little experience all through our section. My first impression was that the farther north we went the more root freezing and root killing there would be, but on talking with these men I found that on account of having some snow there that they did not get the heavy freezing in the ground that we got further south. We are just a trifle south of the southern line of Wisconsin, and the frost there went from 3½ to 5½ feet deep in many places. I had opportunity to travel around considerable last year, and I kept an eye out on the places where the trees suffered the worst, and wherever I found an orchard that did not suffer I tried to study out and see what the cause was, and I found four or five orchards a little south of us, down at Princeton, where they did not lose any trees, but they had a good cover crop. One was cultivated early in the season and then sown with oats, and the oats came up well and held the snow; it also had a wind break, and in that orchard of about 20 acres they had about 2500 bushels of apples this year. In another one of about 25 acres they had about 4,000 bushels, while the farmers all around there where the orchard was either pastured close or was cultivated without a cover crop, lost perhaps half of their trees, so that the cover crop in that place made a great deal of difference.

Mr. Gonzenbach: In talking with a nurseryman lately he made the statement that certain stocks had a tendency to grow tap roots

and that the tap roots promoted the growth of the tree to the exclusion of the fruit, and if that is so, what is the method of preventing such tap roots?

Prof. Moore: Most of the tap roots are destroyed when they are taken from the nursery, if they have that tendency, and I think that that gentleman would have difficulty, probably, in maintaining his first proposition. It is true that we get different root systems on different kinds of varieties, and you will find, I think, the nurserymen without exception will tell you that at least to a degree they can distinguish the kind of variety by the character of the root system regardless of the stock upon which it is propagated.

Mr. Coe: I think so. In many ways we find this fact, that the root is very similar to the top. Take a Tetofsky tree, for instance, which grows very upright and with but two branches. When you come to dig that tree, the roots come down straight, very few fibers. On the other hand, where the tree is broad and spreading, it is likely to have roots of the same character.

Mr. Kellogg: I should like to ask Professor Moore if they have any data regarding the destruction during the winter of 1888 to '89?

Prof. Moore: I cannot answer that question. So far as I know there is no data; that was before my time in Wisconsin, and my predecessors, so far as I know, left no data on that.

Mr. Kellogg: I should like to state that our experience in growing trees in the nursery in 1898–99 was that we lost our entire plantation without regard to age or hardiness of stock, with the exception of those varieties that were freely rooted from the scion, among these Hyslop and Sweet Russett, and some other variety that I do not call to mind just now, but those two varieties I recall distinctly showed vigor and life following that destructive freeze; also the native plums that we were propagating at that time on their own roots. All the plum stocks we had in our plantations that were grafted on European or Japanese stocks were so dead that they were not worth burning up.

Mr. Barnes: I have a sad recollection of having to plow up 6,000 trees that spring that were winter-killed absolutely. I used promiscuous apple seedlings at that time, and I changed my system of grafting to crab roots and succeeded rather better since. In the winter-killing of '88–9, however, I had two short rows of two seedling varieties that originated in Waupaca county. Those trees came through in perfect condition, there are only a few of the two varieties and they stand in the nursery rows yet. I left them there for practical demonstration.

Prof. Moore: Tell us what we have got to strive for.

Mr. Barnes: The best system I know of is to procure the best crab seedlings you can get, cut your roots short and scions long and

plant them in such shape that each scion can send out roots of its own.

Mr. Moyle: What is a French crab?

Prof. Moore: So far as we have been able to determine, French stock is the same thing as what we call seedling apple stock here, that is, they grow apples in France primarily for cider, the kind that will give them the most fruit and these cross indiscriminately in the orchard and that fruit goes to the mills. Those apples from those crossed seeds go to the mill and that seed is sold to us as French crab stock, about which we know absolutely nothing.

Mr. Moyle: I beg to say that I know something about it, I grow it. Now, I am in the business for the dollars and cents, and I want to say right here that the French crab will grow a nicer tree and grow it quicker than anything else that is growing. They are imported very largely by Southwestern nurserymen in Kansas and Nebraska, where most of us get our grafting stocks. The Minnesota nurserymen found out long ago that the French crab is not as hardy as the native seed from the East and they recommend growing seed from the East, Vermont seed they call it. French stock is the most tender stock; last spring we had 8,000 dead on the French crab.

The Secretary: I had a long talk with Professor Hansen, of South Dakota at the Minnesota meeting recently and he said, "It is time you people in Wisconsin quit lying to yourselves on this hardy root question." He said, "You are lying to yourselves; you know the hardy root is what you want and what you have got to have, but you will not admit it."

Mr. Coe: Prof. Hansen is growing hardy plums in Dakota, and half of the parents of the plums are the Japan plums, is not that a fact?

The Secretary: Yes, that is true. You can tell Professor Hansen he is lying to himself, too, if you want to.

THURSDAY MORNING.

PRESIDENT'S ADDRESS.

The year just past since our last winter's meeting of this Society is notable in several ways, being one of the most severe winters we have had in many years, and still there have been noted advancements in Horticulture.

The largest acreage of tree fruits being planted in the history of Horticultural advancement in the state. Thousands of acres of fruit being planted in the past year. A great portion of the planting is in

large commercial orchards. Bayfield county planting approximately 300 acres; Door county planting approximately 2,000 acres; Crawford county 100 acres; and numerous other large plantings, indicates that there is a growing interest in Horticulture in Wisconsin and by men of intelligence and faith in the State as a fruit producing State.

Our Society has done much to assist in this awakening of interest and we must continue to assist in the carrying on of the good work by help and guidance along all lines of development.

Now that the planting has begun, the work of growing fruit is only started, for without proper methods of culture and pruning many will fail.

We must ever advocate improved methods and advance as other states have done. We must ever be on the alert for better methods of culture and protection against severe winter conditions such as the past winter.

We must begin experiments in fertilization and thinning, to put on the market only the best fruit, for with the increased planting unless this is followed closely there will be a quantity of inferior fruit that will find no market.

There should be an organization of fruit growers in this State for studying out improved methods of handling the fruit so that a better distribution can be secured and avoid the congestion of any one market. Other states are doing these things, why can't Wisconsin?

Our Horticultural Department of the University is ready to start experiments in fertilization and thinning of fruit and we should assist them to formulate some plan for the coming season.

In a few years the question will be asked and has been asked to some extent now: Can our old orchards be fertilized and how heavy can we fertilize without fear of injury, and produce superior fruit to that we are growing now?

Our Society has in the past year established to be planted in the spring of 1913 new trial orchards for the listing of some of the most promising of the winter varieties of apples and these will in time prove whether they can be grown successfully or not.

ANNUAL REPORT OF SECRETARY.

The close of the year 1912 and the beginning of 1913 may well be a season of congratulation for all connected in any way with the horticultural development of Wisconsin.

Since 1907 the planting of commercial orchards has progressed steadily and rapidly, until we have at the present time more than 6,000 acres of apple orchards, 3,500 acres of sour cherries and 10,000

acres of small fruits. These figures of course do not include the farm or home orchards.

Over 1,000 acres each of apples and cherries were planted last year in purely commercial orchards. We have within the state the largest cherry orchard in the world, the Coöperative Orchard Co.'s plantation at Sturgeon Bay consisting of six hundred and seventy acres, 67,000 trees, of cherries in one solid block. It is reported that the company plans to plant one hundred and twenty acres more next season, making 800 acres in all.

The second largest orchard in the state is also in Door county, the Ellison Bay Orchard Co.'s orchard at Ellison Bay consisting of 25 acres of plums, 55 acres of cherries and 125 acres of apples or 205 acres in all.

The acreage of tree fruits as well as small fruits set out in the Bayfield and Washburn districts exceeded that of 1911. Carefully compiled data submitted by Secretary Flanders shows that the Bayfield Peninsula now has 638 acres apples; 600 of cherries; 366 of strawberries; 29 of blackberries; 43 of raspberries and 48 of currants or a total of 1,238 acres of tree fruits and 486 acres of small fruits.

In the Kickapoo region planting has proceeded at a steady rate although not so extensively as at the other places mentioned. These three points, Door county, the Bayfield peninsula and the Kickapoo are clearly in the lead in orchard planting and are bound to stay in the front.

This is as it should be: The best results will be had in centralizing the fruit growing business of the state in a few places. Questions of marketing and transportation will be more easily solved and cultural methods will be better controlled from a few central points than if the business is scattered over a wider area.

In fact I am of the opinion that the efforts of this Society should be directed almost wholly to the development of commercial orcharding in but a few places where the conditions are most favorable rather than indiscriminate effort.

It does not follow by any means that the three places mentioned are the only ones in the state where orcharding may be made successful nor must it be inferred that these are the *best* sections for that is a matter open to argument but in these places the people believe in Wisconsin and have backed their confidence with their cash.

It is to be hoped that Manitowoc and Sheboygan counties will soon learn to fully appreciate their unsurpassed advantages for certain lines of fruit growing and get actively into the game.

Certain limited portions of Eau Claire and Chippewa counties have soils and elevations splendidly suited to apple growing.

The Baraboo and Reedsburg sections have produced apples of the highest color and quality of any section in the world for over fifty years and all that Sauk county needs today to make of it one of the biggest apple producing centers in the state and the United States is the full and complete confidence of its people in the possibilities of its clay hillsides.

And so with many other sections of the state, Winnebago, Calumet, Waukesha, Walworth, Vernon and Waupaca counties, faith in the land. faith in the future, a deaf ear to the Pacific Coast Siren, is all that is needed to place them on the map as commercial orchard sections along with Bayfield, Sturgeon Bay and the Kickapoo, Western New York and the Ozarks.

While extensive commercial orcharding is now an established fact, while there is no longer any doubt that Wisconsin is soon to be a great fruit producing state, and while we need more trees and more acres of berries the extension of planting is not by any means our greatest need.

We need first of all better methods. We must produce a higher grade of fruit. Less than a dozen orchards in Wisconsin at the present time produce apples that can demand the best price. The berries that we send out of the state are only indifferently good as a rule.

We spend much time at our conventions and elsewhere talking coöperation, studying coöperative methods of marketing and too little time studying how we may produce *quality* fruit, fruit that is really *worth* marketing. When we can offer apples free from worms and scab and berries of high quality the marketing problem will be more than half solved. Door county cherries are the best in the world, the *quality* of these cherries is unquestioned. This is not due to any large extent to the soil or climate, but to cultural methods. Feeding, pruning and spraying gives them their size and quality. Let us then pray and spray, let devotion to Wisconsin be coupled with an abiding faith in the orchard cultivator and success will be ours.

Coöperative Movements:—The fruit growers of this state are now fairly well organized as to selling and buying. The six coöperative associations; Sparta, Sturgeon Bay, Bayfield, Alma Center, Merrillan and Washburn all report a successful season.

Warrens, Eau Claire and Baraboo each urgently need an association. The next step should be a state wide organization to include every local association in the state. Such associations have recently been organized in Minnesota and Iowa.

Taking an even wider view of the coöperative movement, something near at hand is the union of all the coöperative associations in the states from Arkansas and Missouri on the south to Minnesota and Wisconsin on the north into a "Lakes to Gulf" confederation.

By-Products:—The time is at hand when we must provide for the disposal of the cheaper grades of apples in some other way than packing in barrels or boxes. In the big apple belts of New York and Pennsylvania the cider mills and apple evaporators provide a ready market for cull stock. Wisconsin now needs both of these industries.

THE SOCIETY.

ITS ACTIVITIES AND AFFAIRS IN 1912.

The amendment of the Constitution at the 1912 convention placed the authority to fix the membership fees with the Executive committee and following this action the fee for annual membership was raised by the committee from 50 cents to $1.00 and the life membership fee to $10.00 from $5.00.

The total membership at the date of my last annual report was 1,779, consisting of 1,572 annual and 207 life members which was an increase over 1911 of 360 members.

The total paid membership on the first of January, 1913, was 1,693, consisting of 1,480 annual and 213 life, a decrease of 92 annual and an increase of 6 life.

Evidently there is a very decided difference between the size of a fifty cent piece and a dollar in the minds of 92 of our ex-members. Let us hope that during the coming year the dollar may be measured by a different standard.

FIELD WORK.

As in the past the trial orchards work has occupied the larger part of our time and funds.

The school grounds improvement work has progressed slowly. A brief report upon these two subjects will be presented separately.

STATE FAIR.

The attitude of the State Fair Board toward the Society has materially changed during the past two years and our efforts toward making a bigger and better fair are now fully appreciated.

Through the united efforts of the new Superintendent of Horticulture, President Bingham and his assistant, N. A. Rasmussen, the old historical horticultural building at the fair was completely remodeled so as to show all fruit on flat top tables, the flowers and ornamental plants occupying the middle portion of the building. In the rear a few vegetables could be found which we hope will not be the case next year.

Everything possible should be done by this Society to maintain the cordial relations that now exist and it should be our policy to

assume the responsibility of making the exhibit of fruits and flowers at the State Fair worthy of our orchards and gardens.

We should also use our utmost efforts to secure a new building at the Fair that shall be devoted exclusively to horticulture. Fifty thousand dollars is the least amount that should be expended for this purpose and if the State Fair Board needs help in getting an appropriation for this purpose we should be willing to use our best efforts in that direction.

The conventions during the year, the annual at Madison one year ago and the summer meeting at Bayfield were both well attended and were enjoyed by every one in attendance. This is especially true of the summer meeting at Bayfield where we were royally entertained.

The office work grows with each succeeding year until it now taxes to the utmost the time of the Secretary. With any material increase in the work must come a material increase in the office force.

LOCAL SOCIETIES.

Of the locals only eight have reported; Oshkosh, Lake Geneva, Bayfield, Madison, Manitowoc, Poy Sippi, Waupaca, and Washburn.

The secretary therefore has no means of knowing how many others may be in existence and entitled to such privileges as are now accorded to locals by the state Society.

Oshkosh reports 16 members, 8 meetings during the year and no exhibitions.

Lake Geneva, 30 members, 52 meetings and 5 exhibitions, consisting of Peony, Sweet Peas, General Midsummer Meeting, Dahlia, and Chrysanthemum Shows. Secretary Martinii in his report says: "The Society maintains a commodious exhibition hall and club rooms; has given to the school children of Lake Geneva over $300.00 in prize moneys during the last five years for growing chrysanthemum plants. Will try and get the school board to donate prizes this year, association to furnish sweet pea seeds as a new departure. Exhibitions are well patronized by the public. The Society has installed a reference library of selected books costing over $100.00 to date.

The Bayfield Society leads in membership, now having 157 paid members, held 3 meetings and 3 exhibitions. Secretary Flanders says: "We made an exhibit at the Wisconsin State Fair at Milwaukee, at the County Fair at Iron River and at Bayfield on the occasion of the Summer Meeting of the State Society. At the Bayfield County Fair we took 101 premiums amounting to about $175.00. In addition to these exhibits we have had an almost continuous exhibit of fruits at the rooms of the Bayfield Peninsula Fruit Association and minor exhibits in store windows."

The Waupaca local has 25 members, held one meeting and no exhibitions.

Manitowoc, 35 members, 3 meetings and one exhibition.

Washburn, 31 members, 6 meetings, no exhibitions.

Our official organ, WISCONSIN HORTICULTURE, while not by any means as good as it ought to be, seems to be fairly well received and it is probable that it will continue to at least hold its own.

ABSTRACT OF REPORTS FROM LOCAL HORTICULTURAL SOCIETIES FOR 1912.

Name.	Number of members.	Fee charged.	Number of meetings during year.	Average attendance.	Number of exhibitions.
Poy Sippi Horticultural Society	22	$0 25	4	40	2
Bayfield Peninsula Horticultural Soc.	157	50	3	50	3
Lake Geneva Gardener's and Foremen's Association	30	2 00	52	12	5
Waupaca County Horticultural Soc.	25	50	1	100	.....
Manitowoc County Horticultural Soc.	59	75	3	30	1
Washburn Horticultural Society	31	1 00	6	12	0
Oshkosh Horticultural Society	16	1 00	8	35	0
Madison Horticultural Society	28	1 00	6	20	0

NEW WORK.

On November 15th and 16th there was held at Bayfield a fruit growers institute that was highly successful. This institute points the way to an entirely new line of work, and it rests entirely with the members of this Society whether such work shall be enlarged and continued to cover every point in the state where fruit growing is or may be an important business.

These institutes would not take the place of the farm institutes, but be supplementary thereto. It would seem that no one could question either the right of the Society to engage in such work or the value of it. The Agricultural College, the County Schools of Agriculture with the different extension bureaus of the University are now and always will be the main and central forces in agricultural education and their field of influence will be steadily enlarged, but no matter how far or wide this system of education, academic as it must be, may extend, it will never cover the whole field.

The success of the farm institute work in this and other states has demonstrated its usefulness. The State Society has for four years contributed annually from three hundred to three hundred and fifty dollars to the Farm Institute fund and this year will double that sum which will be applied on the payment of the salaries and expenses of two special lecturers on fruit growing. Our worthy president, D. E. Bingham, has served alone in the past, covering about one-third of the institutes and this year will be assisted by our vice-president, C. L. Richardson.

As the Farm Institute plans to reach the towns farthest back from the main lines of travel this work may well be continued and in addition regular two-day fruit institutes may be held at fruit centers. All of this will cost money, but there need be no concern felt on that point.

It will not be sufficient for us to rest content with the work we have done and are doing; we must move at least one notch ahead every year. Will it be fruit growers' institutes? The answer to this question rests entirely with the members of this Society.

In the line of new legislation we may reasonably concern ourselves with the following:

(1). A change in the Weights and Measures law fixing the weight of a bushel of apples at 44 pounds.

(2). Provisions for the payment to owners of orchards and gardens for damage done by protected game.

In conclusion I will but repeat the introduction to this report:—the present time should be one of congratulation to every member of the Society. Harmony prevails, the same unselfish spirit that has placed us in the front rank of horticultural societies is still in evidence.

There is no reason why we should not continue in the future as in the past to be the most influential and helpful body of its kind in the state.

REPORT ON FIELD WORK.

Following the usual custom the report on these matters will be brief as the report of the chairman of the trial orchard committee which follows will no doubt give fully the facts concerning the different orchards visited by the committee.

The following points of general interest are taken from the records in the Secretary's office.

We now have nine trial orchards and stations as follows:

Gays Mills, 7 acres apples, 1 acre cherries, 1 acre grapes.

Sparta, 1 acre grapes.

Poplar, 6 acres apples, 1 acre plums.

Wausau, 7 acres apples, 3 acres cherries and plums.

Medford, 3½ acres apples, ⅓ acre plums.

Lake Geneva, 7 acres apples, 1 acre cherries.

Manitowoc, 5 acres apples, one acre cherries.

Whitehall, 5 acres apples.

Total 53 acres.

In addition, two more of 5 acres each are to be planted next spring, one at Baraboo and one at Pewaukee.

Two orchards were dropped from our rolls the past year and the books closed, Barron and Sturgeon Bay.

After five years trial the committee concluded that it was not practical to raise apples at Barron and the lease was relinquished. The entire cost of the Barron orchard, exclusive of traveling expenses was $448.27.

At Sturgeon Bay the period of expiration of our 5 year lease seemed to be a good time to quit.

The Poplar orchard was first planted in 1904 and replanted many times since. The cost to date exclusive of traveling expenses is as follows:

Nursery stock	$ 440 22
Tile draining	708 16
Rent and labor	1,511 31
Miscellaneous expense	130 68
Total	$2,790 37

The returns to date amount to $106.20.

While the Poplar orchard has absorbed nearly three thousand dollars of our funds in eight years it has been worth all it has cost. It has demonstrated clearly that only the very hardiest varieties of apples may be grown there and that tile draining is absolutely essential to raise even these successfully.

The orchard, consisting almost wholly of Patten Greening, Duchess and Hibernal, besides an acre of native plums, is now in a thrifty condition and promises some returns on our investment during the remainder of our lease.

Since March 1904 the Wausau orchard has cost $2,020.04 and yielded an income of $2,198.53, or a balance on the right side of $178.49.

As our lease has five years more to run we also stand a chance here to come out even and if we do this it will be a remarkable record as all who have had charge of similar experimental work can testify. If the accounts of the Wausau, Maple, Poplar and Medford orchards balance at the expiration of the leases, if in other words the experiments shall have been conducted without cost to the taxpayers we may indeed be proud of the record.

In the case of Gays Mills, Manitowoc, Lake Geneva and possibly Whitehall we expect a profit.

The growing of grapes at Sparta does not appear to be a successful undertaking. The acre of Worden and Moore's Early, planted in 1908 has cost for vines, labor, trellis, spray pump, etc., $220.66 and the returns amount to $28.39. There have been some unavoidable setbacks, but even allowing for these there does not seem to be a very wide margin of profit.

The conduct of the other orchards presents no facts of interest that will not be covered by the report of the trial orchard committee.

SCHOOL GROUNDS.

There is nothing cheerful to report in this field of work. There has been no progress during the year, in fact we have barely held our own.

We have 15-year contracts with six different schools as follows: Branch, Fond du Lac, Lancaster, Baraboo, Waukesha and Sturgeon Bay.

These have cost for nursery stock, transportation, etc., a total of $548.67 as follows:

Branch, $82.52; Baraboo, $106.99; Lancaster, $179.39; Sturgeon Bay, $125.67; Fond du Lac, $26.75; Waukesha, $27.35.

In not a single case has the result been such as to warrant a continuation of the work.

The almost universal lack of interest on the part of the school officers, lack of coöperation on the part of the teachers, the long summer vacation when the school grounds are wholly deserted and the shrubs left to the ravages of drought and weeds all conspire to discouragement.

The blame, however, must not all be placed on the schools and in fact it is doubtful if any of it should be so fixed. We are evidently trying to do something for which there was no demand, trying to give the schools something that they do not want.

It will be necessary to start at the beginning and by a long and patient course of education create a demand for the beautification of rural school premises and then set out to fill that want.

It is also probable that we have begun at the wrong end of the problem. The great need of the children and teachers in rural schools is playgrounds rather than trees and shrubs.

The boy or girl in the average rural school is far more restricted as to playground privileges than the child in the village or city school. The site of the average school in the country seems to have been selected because it was entirely unfit for any other purpose.

Less than one-half acre is the allotment and the school building set in the middle of the plat. This leaves mighty little room even for a respectable game of tag and we in our mighty wisdom come along and take up most of this little room with trees, walks and shrubs.

If we have started wrong we should back up and take a fresh start as there is no good reason for quitting. I suggest: that the contracts now in force be continued, following the plans already adopted; that a sum of money be set aside to be used in coöperation with two or more of these schools to secure larger playgrounds and a limited amount of play apparatus; that our campaign of education be continued as in the past but directed more fully to the playground idea.

Horticulturists are home builders and next to the home and the church the school should command our best interest and attention. Let us make our schools the most attractive outside, as they are bound to be the best inside, of any in the United States.

REPORT OF TRIAL ORCHARD COMMITTEE.

J. S. PALMER, CHAIRMAN.

The orchard at Gays Mills still shows the vigor and thriftiness that has been characteristic of that orchard since it was started. A few trees were bearing and the fruit was absolutely free from defects or blemishes.

Some Wisconsin rabbits trespassed in this orchard last winter and destroyed a few trees and badly injured several more; an argument convincing us that we must protect the trees up to several years old. The vineyard was in fine condition and the vines were well laden with fruit.

At Whitehall the orchard shows some blight and also some winter injury. Trees were in better condition on the north slope than on the top of the hill, probably owing to better soil on the slope. Cherries were in fair condition, some foliage injured by fungus and a few trees dead.

At Manitowoc the orchard is blighting somewhat, but otherwise is making a fair growth and looks promising. Some trees have split down. The cherries are now doing fairly well, making some growth and seem well established.

At Lake Geneva the orchard is in fine condition and making a very good growth. The trees all look thrifty, some trees were bearing. The Talman Sweet trees were bearing Price's Sweet apples, which shows that things are not always just what they seem. The cherry trees were badly affected with fungus, in some cases foliage nearly all gone.

The Poplar orchard has improved somewhat in recent years since the soil was tile drained. Some trees were badly blighted and the orchard was infected with aphis. In some cases the new growth was almost all killed from this cause. Hibernal, Duchess, Wealthy and some other varieties were bearing. The native plums were in good condition and were loaded with fruit.

At Maple the orchard is in fair condition. Some trees were badly infested with aphis and a few were dead from winter injury, borers and other causes.

The Medford orchard is in a good state of cultivation but the trees have made almost no growth this season. These trees show the effects

of the severe winter more than any other of the trial orchards. Sixty-one trees are dead, and several more are in bad condition. Duchess, Wolf River, Hibernal and Longfield have survived. Of the native plums, many are dead and more are badly injured.

The experimental plat in the Wausau orchard originally contained 138 varieties of apples besides cherry and plum trees. The Newell, Thompson's 29, Flushing, Spitzenberg, Murray, American Codling, Longfield and Eureka have all been sickly and are nearly dead now. Cherries are all dead. In this plat Mr. Phillips and Mr. Kellogg started several experiments, one of which is quite striking. The following varieties were planted in threes, 1 ordinary nursery tree, then three root grafts in a group and the best one eventually selected, and one Virginia crab, which was top-worked the following year—Wolf River, McMahon, Dominion, Northwestern Greening, Okabena, Peerless, Wealthy and Patten's Greening. In the case of the McMahon, Northwestern Greening and Patten's Greening the top-worked tree is decidedly the best in every case, much larger, better branched, foliage darker, and evidently more productive.

Of the two remaining the root graft is usually better but not always. There seems to be no great difference in these two and both far behind the top-worked trees. In the commercial plat the Hibernal, Duchess, McMahon, Dudley, Peerless, Patten's Greening and Avista are in good condition. Longfield, Newell's Winter, Repka, Okabena and Dominion Winter are dead or badly injured. The Northwestern Greening also badly injured.

THURSDAY EVENING.

"The Best Session."

PROGRAM.

MRS. L. H. PALMER, Presiding.

FIRST AID TO THE HOUSEWIFE.....MISS ABBY MARLATT, U. W.
FUNDAMENTALS OF COÖPERATION.....MISS FLORA RICH, Baraboo.
THE HOME AS A SOCIAL CENTER.....MRS. L. H. PALMER.
COLOR, ITS VALUE TO HORTICULTURISTS.....MISS BERNICE HATCH.....
Sturgeon Bay.

FIRST AID TO THE HOUSEWIFE.

PROF. ABBY MARLATT, University of Wisconsin.

Usually "first aids" implies that there is to come, sometime in the near future, the skilled physician who will apply the proper remedy, or at least leave the assurance that all has been done that human power can do.

With our present changing ideals what may seem now a serious ill may eventually prove to be only a slight disturbance of the social body adjusting to changing environment.

With our individualistic tendencies the old order of the served and the servitor in household affairs has become so upset that there may be a doubt as to which is which.

To arrive at such a point that the one served may in his place assume the duties of the serf is but in line with the evolutions in national history.

It may not have been pleasant for the aristocrat to become the citoyenne in the French Revolution but unless history tells us false she did her part with grace and courage. The intimate French Memoirs of that day tell no more striking truth.

The housewife of to-day must meet her French Revolution with equal courage, tact, grace and savoir faire. We confront the age when the individual service of one or more houseworkers, always ready to answer demands, will be replaced by mechanically applied energy in the form of the so-called "labor saving devices."

We need to become skilled not only in physics but to become mechanical engineers so as to use and readjust these "first aids" which are the half scientific treatment for what may prove to be a serious ill necessitating the surgical skill which shall excise the offending part even to the major operation of cutting out the separate home from our midst.

Like the wise doctor some of us are letting nature do her best while others are treating the condition with a liberal diet of patented articles, most of which prove of little service. What we need is not more apparatus which like most drugs will make us work harder but a simpler, saner form of life which will allow us as housekeepers to readjust to meet the new conditions.

Frankfort has a museum of "horribles" in house decoration. Would that there were more in museums.

A casual journey through the house with critical glasses even charitably clouded will convince the open-minded that each has the beginning of such a museum. We may argue with our saner self that these ornaments and dust collecting articles of furniture are dear to us through wealth of sentiment and association but in the last analysis are we not paying a very heavy price in energy, time, health, and intellectual loneliness for what we can remember in our mental museum where neither moth nor dust doth corrupt nor, better yet, neighbors break in and deride. Yes, I know it is "our own business" but, really, is it? We cannot live to ourselves alone. We set a standard which may enslave our friend or the stranger within our gates.

It may be soul uplifting to be forever pursuing the misplaced dust and I am open to conviction but warn the defender that weighty arguments are necessary.

Why give the germ laden dust of our cities so many changes of scene? Dust sitting tight is harming no one. We do not know that it is a charitable act to give it a moving day as often as we do.

Eliminate projecting surfaces around doors and windows. Discard the ugly mantel for the decorative tile or brick fireplace without shelves. Choose woods for their beauty of grain and texture and then eliminate decorative details which add to labor but do not enhance the artistic effect.

In furniture make the salient factors quality in material, beauty in line and harmony in mass. That which increases dust area should be reduced to a minimum. This does not confine the choice to the massive or the straight line but it does put material and harmony first as the determining factors in selection.

Those hangings which are heavy and rough are sources of labor and harborers of dust.

Smooth finish and ease in cleaning should be the first consideration in any textile material used in interior decoration. The vacuum cleaner will search out the dirt from even a chenille portiere but why have the chenille or its near relative?

Curtains at windows should exclude the person outside but not the light and air. They should add to the beauty but not materially to the labor problem in the home. Discard them if they do.

Floors were made to walk upon and that fact should be ever uppermost in the selection of coverings. Walking will tend to create air currents which carry dust. Therefore the floor covering should be either nonporous or easily moved into the open air to be cleaned and disinfected by the sun.

The vacuum cleaner is the panacea for rooms heavily hung and spread with rough textiles.

Pictures:—If one has no views from windows then one may substitute other views but remember we can study but one view at a time and copy the Japanese who keep their treasures in a fireproof "godown" using but one at a time. It is considered the highest compliment to give a friend one's undivided attention. Why not compliment inanimate things?

Forms of labor in the home are:—**Cleaning; Cooking; Care.**

The three C's we do for the sake of the fourth which justifies the home, the Children. Nothing else would warrant the archaic standards we maintain.

Sometimes we wonder if there is not some other way to provide that right environment for the child which will leave him free to develop all that is best and therefore justify his living in the world.

But this is a talk on "first aids" and is not a clinic.

Cleaning:

The problems may be grouped into: (1) **Floor; Floor covering,** (2) **Wall, Wall hangings,** (3) **Windows; Window curtains,** (4) **Furniture,** (5) **Textiles,** (6) **Dishes.**

The apparatus used in any case should meet the following conditions: (1) **Easily managed,** (2) **Successful,** (3) **Sanitary,** (4) **Not easily broken,** (5) **Easily repaired,** (6) **Moderate in expense.**

The first is most essential as the more nearly fool proof the utensil is the less is it in danger of failing in the other factors.

The second is very important as efficiency is our measure of success; we cannot spend time on half measure. The moderately good egg is never acceptable.

The third is the hardest test to apply as authorities differ as to modes of infection. But he who takes all precautions may escape infection.

The vacuum cleaner has been proved to be a sad offender on this third count. The stationary form where the dust is sucked eventually into the sewer is the least objectionable. The hand ones distribute bacteria while removing the coarser particles of matter. We may use them as the lesser of two evils but we should, like the old lady with her new broom "neither borrow or lend." That utensil which requires skilled workmen to repair is the one which soon finds its way to the junk shop or the storeroom.

Women spend in small amounts at a time and though the totals are often startlingly large yet the habit of paying ten, twenty, fifty, one hundred dollars for one piece of apparatus is not ours, however much we may spend on clothes, books, art. Hence, the very expensive and perhaps more nearly perfect utensil has not a ready sale. "Something just as good" is taken under the skilled psychology of suggestion of the salesman. The carpet sweeper is better than the broom, the dustless mop is better than the floor brush but the vacuum cleaner is better than all for it in a measure removes the dust rather than disturbs it.

The window cleaning problem is easy or difficult according to the form of window.The window is primarily to let in air and light and yet we seldom build it to meet the first perfectly. The casement window to-day with its adjustable hardware is easy to clean and gives the maximum amount of air. It should be of unleaded glass if labor is a factor.

That furniture which allows of long sweeping movements of the dustless dust cloth is a labor saving device. It should also be good to look upon. Built-in furniture tends to lessen labor in that it prevents the moving to secure the dust which will lodge behind or under the non-stationary article. Bookcases, sideboards, cupboards, wood

tables, settles, ice-boxes, ranges, should be a part of the house and carry out the wood treatment, color scheme and design.

The tendency to have the furniture of a house designed for it is a step toward a better house decoration and if care is taken may simplify the expense and later the cost of labor.

For ease in work all beds, sinks, work tables, laundry tubs, wash bowls, ranges, should be placed at such a height that the worker need not bend in doing the necessary work.

In any room, but most of all in the kitchen should the aids to labor be adjusted to conserve energy.

The worker should have all material ready for work, so placed that the fewest movements are required to complete the task. Sink, work table, range, cupboard, should be not more than a step apart. It can be arranged even in a large kitchen by shifting apparatus leaving the altogether uninhabited interior as an empty area to rest the eye upon but not to sprint across in vain endeavor to complete a task in a short time.

Discard an out of the way sink and use dish pans on a high table. Sit on a high stool but do not bend without you return to primitive attitude of walking on four feet as a physical training exercise. The physical poise is an exposure of the mental state but the mental state is affected by suggestions. A low sink suggests a stooped back—per see we acquire it.

The laundry apparatus sold for the household is all belated "first aids" as the laundry is one of the industries which should be taken from the home. Reform the public laundries and force them to be sanitary and to use precautions which will allow *us* to wear out our garments. A determined demand by woman usually has a result and in this man would help as he too is a victim.

But to return to the laundry apparatus. The set tubs are too low. The "Trust" reduces the initial cost in shortening standards and pipes. The power washers are also low to fit the tubs. The type may be the milk stool variety which in careless hands tears the clothes; it may be the oscillating type which is expensive, or the vacuum type which in many ways is more nearly scientific. The price will vary according to the commission given to the middle man: often one-third the amount asked.

The hand power is always moderate in price, the water motor is next, then comes the gas motor and last and most expensive is the electric motor type of power.

In selecting the machine the purchaser should ascertain if the initial cost will not be prohibitive for value received; if the cost of maintenance is not excessive; if the material can be made sanitary without too much use of brains, and last but not least, if it will work,

Wood is not satisfactory. Galvanized iron is cheap and for a time satisfactory. Copper is expensive but lasting.

A hand power milk stock type of washer may be secured for seven dollars. An electric power, copper oscillator for over a hundred. Wet or rough dry laundry work may be done for from 25 to 50 cents a pound.

In either case the ironing will disinfect the clothes. Which is cheaper—a mechanical washer, water, soap, bleachers, room rent, or rough dry or even wet laundry process in a public shop?

A motor may be used to aid in mechanical routine work. Run a sewing machine, mix bread, grind coffee, beat eggs, turn an ice cream freezer, polish silver as well as do the laundry work. The cost is not much considering the fun you may have, the patience you may cultivate. Few homes require so much of any of these forms of labor done that the expenditure seems justified. The question is, would you take the time to adjust, set up, supervise and replace a complicated piece of apparatus? Do you know how to adjust it when out of order? Is there a place where you can learn? Will the helper bother with it or will you find it later hidden away where it is safe?

I have found that in my own work I am willing to try but quickly discard most of the so-called "first aids". They are time consumers and time is what we cannot waste.

Electric cooking apparatus as toasters and hot plates are labor saving devices and not expensive to maintain but the electric ranges are an expensive luxury.

Fireless cookers are labor saving and when used with discrimination are economical.

Pressure cookers are for the scientifically trained. They are not for the ignorant or the absent-minded. Alcohol stoves have their place but even they may be a source of danger in careless hands. They are an excellent aid in the time of hurry.

With a fireless and an electric hot plate, and an alcohol burner plus a nearby bakery (which is supervised) the kitchen may be only a butler's pantry.

Cooking utensils may be judged by the following standards:—(1) **Conductivity (does not waste heat)**, (2) **Insolubility (not affected by acids or alkali)**, (3) **Durability (with ordinary care)**, (4) **Easily cleaned**, (5) **Not easily oxidized.**

Few metals or patent coatings meet these. Aluminum is an excellent conductor of heat, but it is not insoluble, neither is it durable in careless hands. It will burn to white powder if allowed to become dry over a gas flame. It is not easily cleaned. Iron is satisfactory as to conduction, durability and easily cleaned. With ordinary pre-

caution it is not soluble in food not containing acids. It will oxidize —(rust).

Enamel ware is insoluble, easily cleaned, does not oxidize but it is not durable and is only fairly good as a conducting medium. Porcelain is excellent in all but durability. Tin is excellent in heat conducting, is easily cleaned and not oxidized, but fails in that it is acted on by acids and is not durable. Silver answers all the counts, but alas! is too expensive. Copper, tin lined, is best, but alas! dear. Glass answers all but durability. It must be the annealed variety which makes it expensive. I would use porcelain and iron if I could afford the porcelain.

Dish washers for the home are not as yet satisfactory. Most of those I know are now stored as curiosities. The simple device of a large dish pan, a wire basket to fit, a soap shaker, and a mop, with plenty of boiling water is as yet the best solution.

The hotel dish washer is fairly successful but even in these breakage may be excessive and the dishes are not always clean. A hot water hose system is yet to be perfected. If hot water could be forced through a soap receptacle and then used without soap in rinsing, the dish washing problem would consist of arranging for the washing and draining dry and then replacing in shelves.

Knowledge of chemistry in house work will save many a mistake in purchase of apparatus and material as well as in use of method. For example, in the one item of electrolytic action of different metals in an alkaline solution as soda or even common salt, a chemist would understand that the essentials are two strips of metal—as tin and zinc —placed with the discolored silver in the hot soda or salt solution to accomplish the cleaning action claimed for the silver clean pan. The difference in cost and space occupied by apparatus is as ten cents to thirty times that.

In other words the essentials are knowledge of the fundamental sciences as physics, chemistry, biology and a sane judgment which will avoid the nonessentials in housekeeping, using the commercial products in food, utensils, laundry work when they meet the needs, not hesitating to spend wisely when such expenditure means health gained or conserved; means leisure to live with family and friends or even that leisure which allows us like the old darky who "was jus' serenading muh soul."

FUNDAMENTALS OF CO-OPERATION.

MISS FLORA RICH.

In every department of life there has been gradual awakening to a realization of the necessity for such compromise and adjustment of economic conditions as shall unify the various phases of human existence, strengthening, upbuilding, and by concentration, eliminating what has been wasted energy.

"The spirit of coöperation is the master spirit of the age," as has been said; and when united with the spirit of equity it must ultimately prove a solution of the existing evils.

Much has been done in nearly every branch of industry and commerce, organizing for a betterment of conditions.

The church, the trusts, civic associations and the unions are all organizations for either mutual or individual gain, and were I to enumerate even a small portion of the many industries and institutions of like spirit, all showing an awakening to the advantage of pulling together, it would weary you unnecessarily, as you in all probability are well acquainted with what is being done by the elimination of misdirected effort, and the conservation of resources, in the particular industry in which you are interested.

I choose, however, that special phase of the subject that is, or should be, of paramount interest to every earnest and intelligent man or woman, in consideration of its relation to the cause and reason for all our best endeavor—the home.

We find here the essential coöperation of the individual efforts of two or more persons, united for the furtherance of mutual interests.

When a man and woman unite their strength for the creation and maintenance of a home they form of their united interests a partnership, the success of which rests upon their personal coöperation.

Each does not do just what the other does, but, having a distinct individuality, the natural or acquired ability of one counteracts the deficiences of the other, creating thus a well rounded and harmonious whole.

Nowhere is copartnership more essential than on the farm, where the home interests are so much a part of the business.

In the division of effort the providing of financial support naturally is assumed by the man, while the woman should be prepared to employ such provision to its best advantage, for as has been said, "the value of the dollar a man earns is determined by the intelligence of the woman who uses it."

As many responsibilities which necessity formerly forced upon women have gradually slipped from their shoulders, they must assume the new responsibilities consequent upon the new conditions.

But, however the conditions may change, the highest calling of woman still is, and always will be, home-making.

Housekeeping and home making together constitute a profession, and there is no business more important or difficult known to modern times.

A woman, therefore, destined to become a home maker, must have adequate preparation for her business.

The problem of how to live within the income depends largely upon the executive ability of the woman, and on a farm, where the income may not always be determined in dollars and cents, this presents problems less easily defined.

Here, too, she must make discreet use of the raw materials as well as show judgment and foresight in the purchasing of various necessities. Utmost importance should be placed upon a proper understanding of the relative value of foodstuffs, and the care in their selection as well as preparation, for on this depends not alone the present health and pleasure of the family but the future welfare of the home and its interests, through the influence exerted upon the mental and physical condition of its various members.

Ingenuity and intelligence in utilizing materials and avoiding waste in all departments of the household should be given thoughtful consideration, especially the ability to satisfactorily perform the necessary duties of the housekeeper with the least waste of time and energy.

No understanding of the technique of home making is complete without a thoroughly worked out plan of scientific household management, with system in all its departments. This need not be so rigid as to disturb the equanimity of the entire home, but if properly arranged will prove, as in other business, a servant rather than a master.

If she cannot have the advantage of improvements which the modern domestic scientists consider necessary, she may cultivate her own inventive instinct and avail herself of many recent innovations and ideas.

Home Economics is not, however, only of interest to the woman, it should arouse the intelligent sympathy of the man. As home may be—

> "Just a wee cot—the cricket's chirr—
> Love and the smiling face of her,"

the business of home making upon a coöperative basis must bring an answering smile from him, for

> To make a happy fireside clime
> To weans and wife,
> That's the true pathos and sublime,
> Of human life.

With a realization of the need and economy of having convenient and up-to-date implements with which to work, the man should also recognize the equal importance of conserving the energy of his co-worker, and using ability to the best advantage.

Time and energy form the principal capital on which their business is based, and a careless use or waste of either is not only unwise but uneconomic.

Many appliances which have long been considered "conveniences" and "luxuries," the securing of which marks the goal of all their striving, may rightly become, rather, the means of attaining that end.

In what is usually classed as by-products of the farm, such as poultry-raising, gardening, and bee-culture, the woman has an opportunity to take an active interest; and here, too, the coöperative spirit should hold.

The proper housing of the poultry is quite as important as that of the other stock, and it is but just that the farm contribute as much to its support as to other sources of revenue.

We hear much concerning the respective rights of husband and wife to the "pocketbook," but in this business, wherein equal interests and resources, brought about by equal division of labor, is vested, the partners must have confidence enough in each other to accept the conditions of the firm.

There need be no division of the pocketbook, no allowance for household or personal expenses, but each should feel at liberty to use their own judgment in the expenditure of funds. If each respect the opinion and judgment of the other, satisfactory results must follow.

In this system of living there is no room for the young people who start their life together with the idea that the business is quite apart from the home, and is to be considered only when it fails to provide the home with the necessary support and required luxuries. The interests of the business and the home are synonomous, and as the one is disregarded the other suffers.

Most significant is the consequence of coöperation in the true business of the home, the production of efficient men and women, the citizens on whom will depend the future welfare of our country.

The best teachers of industry are men and women who have had years of practical experience. With the parents' influence and example they will learn the true meaning of "home," the importance of properly directed effort, and the value of knowledge in efficient home-building. Called upon at an early age to share the parents' activity they will be given an insight into the industrial processes and acquire habits of work.

The influence of the home life will act upon the school life, and with the parents' coöperation the public school system may become more adapted to the real needs of the children, and through it, too, a greater interest in the life of the country will be awakened. A well graded course of study, more competent teachers, and practical instructions in agriculture and home economics, added to the home training will not only keep the boys and girls on the farm but do much to solve the labor problem, for with their added respect for the farm they will have acquired the right attitude toward their work.

Another problem, which has long agitated the minds of men and women, that of their respective rights, will be solved, for equal responsibilities necessitate equal privileges.

The home will stand, the result of two endeavors, the visible expression of two natures, actuated by the same ideal, the "demands" of the one having been met by the "supplies" of the other; a peaceful, harmonious, miniature republic, united by the tenderest ties, whose government is its own, administered for the common interest.

Is this but the dream of a constructive idealist? I do not think so—

"Home is the resort
Of love, of joy, of peace, and plenty; where
Supporting and supported, polished friends
And dear relations mingle into bliss."

THE HOME SHOULD BE A SOCIAL CENTER.

MRS. L. H. PALMER.

The question is frequently asked, "What place does the home and home maker occupy in the economic world?"

There should be no attempt made to place a cash value on the influence of the home or home maker. Home means something too sacred to come into the commercial world. It means mother, father and the children. It stands for all that is lovable or worth living for. It is all that binds the human race together. The home maker has a work to do, a holy service to render to the world, that is far above a money value.

Every home should be a social center, where old and young can meet for a social hour, and children should be helped to feel that there is no place where they and their friends can have quite as good times as at home. If that spirit was fully lived up to it would do more to close the saloon doors than all the political "isms" together. There is an atmosphere of refinement, a feeling of cordial fellowship, about a home function that is never present at a public entertainment, however well conducted.

The home affairs should be so managed that each individual understands that he is a part of the whole, with specific duties and obligations. That the material and social life of the home depends on the willing coöperation of the members.

Parents should understand the necessity of training the children to willing obedience of home rule; that the home is a small republic in which all have an equal right to work, play and share what comes in the way of success, or the reverse, and as all know that "into each life some rain will fall" children should be taught to meet disappointment bravely, and feel that they can do much to comfort those who are in trouble.

The family life should be so regulated, that there will be stated times for work, study and social recreation; all holy days should be observed by having suitable entertainments, and children should be taught the significance of the day, especially Christmas.

Much of the discontent and dislike of work among children could be avoided if parents would go cheerfully about their own duties. Don't expect children to be willing workers when they constantly hear older people complain of the drudgery of work and wishing they might live without it, scrimping and denying themselves and families many pleasures that they may accumulate money enough to go into town to live where there is something doing.

Suppose you get something started in the country. There is the best of material in the bright boys and girls around you who ought to be kept busy and all they need, is to be guided by some one with mature judgment who has not forgotten how to be young. Invite the neighbors to help plan the work, so that there will be time and opportunity for parties, picnics and literary meetings. Organize clubs for culture and social purposes and when club evening comes don't imagine you are too tired to go. Take part in the entertainment and let the young people see that the old folks are *alive* and intend remaining so.

There is nothing that will spur on the mental activity of the young like a literary contest in which old and young meet in friendly rivalry.

We are too much given to cultivating that *tired feeling* as we draw near life's meridian and begin to think the new house with its fine furnishings is just a little too nice to give parties in, and that there is no sense in the young people wanting parties. The home should be as fine as can be afforded but there should be nothing too good for family use. There should be an abundance of good reading, music and games that the home life may be such that in after years, when the children look back to the dear old home their sweetest memories will be of the quiet evenings spent at home with the family.

The home should radiate a feeling of good fellowship, that expanding in ever widening circles, until meeting counter currents, the community will be united in a harmonious whole to foster and keep alive the sentiment so beautifully expressed long years ago, by the homeless, home loving John Howard Payne, in his immortal poem,

"Home, Sweet Home, be it ever so humble,
There is no place like home."

COLOR, ITS VALUE TO THE HORTICULTURIST.

MISS BERNICE HATCH.

It is not alone the artist, the painter or the cloth maker who, for both aesthetic and practical reasons must carefully select the colors they use in their products, but the horticulturist as well. It may be asserted that the color of the goods which the horticulturist produces is cared for by nature and so a study of color value would be useless to him. Civilized man has been educated beyond the stage where a string of bright beads, a piece of tinsel or bright cloth is prized highly for just its color as the Indians do; still, as we pass by the fruit stand, the grocer's or the florist's window, we realize that their success will depend largely on the color of the goods they display. It is a bit of irony perhaps that the reddest apples may not be of the best flavor or that the brightest flower may not have the sweetest perfume. Education does not, however, draw us away from love of color although it may teach us to discriminate between mere gaudiness and true brilliancy, and between a color which flashes but soon tires and one which though more subdued may satisfy by the softness and sweetness of its tones just as in music a nocturne may be restful after a brilliant military march.

So much has the value of color been recognized that prominent psychologists have made extensive study of its effect on the minds of school children and in many places lessons are given designed to teach the students chromatic harmonies. It is found that color may not only be attractive and produce a pleasing, restful or quieting effect but may serve the opposite purpose of exciting, irritating or wearying. Edgar Allen Poe in one of his noted tales, "The Fall of the House of Usher," used the color effect of the rooms and of the lighting to produce the wierd, ghostly effect of his story. Many color experiments have been tried on folks, sick and well; and while yellow proves merely cheering and sunny, colors that are strongly red have been found to be somewhat exciting and those that are strongly blue to be depressing. Consciously or otherwise we react to their influence and confess to this in such expressions as "red with anger" and "having the blues"; while a thoughtful mood we characterize as a "brown study."

The environment of a person may greatly influence the color sense. The amount of color which a place possesses varies, due largely to the location, the vegetation, and to the water. In our climate, nature moves in great shifting masses of green and brown and gold. We are favored above many places by the endless variety of shades and tints in our plants, trees, shrubs, flowers and fruit.

While passing through Arizona a year or so ago I was forcibly impressed by the colorlessness of the towns. We passed village after village where the only color was the grayish brown of the adobe. It called to mind a story I once read of a girl, to whom a friend sent a beautifully illustrated book. The girl, in thanking her, wrote, "I shall prize it highly for its beauty, for there isn't much color in our town." We accept the beauty and freshness of our vegetation without comment because we have always had it so. A man who has been out west in an irrigated country where the hills are brown nearly all the year with the sage brush and grease-wood, crossed the mountains and came down into the Mississippi valley. He said the freshness of the green vegetation was like a drink of cool water on a hot day. I think that often we do not appreciate the comfort which may be obtained from a strip of smooth green lawn or a group of shrubs or of a flower bed well cultivated. My earliest impression of childhood is of a place filled with fruits and flowers. I can close my eyes now and see all the brightness of those long summers. One of my earliest remembrances is of walking under rows of McMahon apple trees with their branches so filled with pink and white flowers that it was an enchanted world to me. I can never remember a day from the time the snow was gone until the frost came when I could not go out and pick flowers, great arms full of nature's color gifts. Children love color and much of their enjoyment of flowers is from mere love of it. They have not yet learned to look deep into the flower as Tennyson did and say,

> "Little flower in a crannied wall,
> I pluck you from your crannies,
> Hold you here in my hand,
> Little flower, if I could but know what you are
> Root and branch and all in all
> I could tell you what God and man is."

A long time ago I remember thinking that the nasturtiums were a gaudy flower, but we have come to prize them as highly as any of our flowers. They bloom so early and so freely and if you will go out even after the first frost you may find a few which have withstood the cold and are still bright. If the day is dark and cloudy try arranging a large bouquet, using both leaves and flowers in the living room and see if it does not bring in the effect of bright cheery sunshine. While on a trip down south with a party of friends we stopped at a

little town in Southern Georgia. While we were going through a park a negro lad of sixteen or seventeen came to one of the young ladies in the party and presented her with a large bouquet of flowers of perhaps ten varieties. It was brilliant beyond description for there were roses, daisies, heliotrope and many strange southern flowers. Just to show her appreciation the young lady said, "They are beautiful, but can you tell me the names of some of them?" The negro lad smiled and said, "Why Missus, I don't know the names of any of the flowers, but I just admiah their colah."

Out in California the poinsettias are admired so much and when you see them in great groups in the parks it is easy to understand why they are so popular. It is truly their color, for they are not overly graceful in shape and are lacking in perfume, but they are the brightest cheeriest red you ever saw.

It is not alone for aesthetic reasons that we should plant for color but often for purely practical and commercial reasons. The bright red apple is traditional with the schoolboy. I like to stop in front of a fruit store and admire the apples which the dealers used to tell us came from New York but now-a-days say come from Washington. I often wonder if some of them don't grow right here in Wisconsin. There is a beautiful apple, thought of little value to use, called the Lubsk Queen. It is very white with pink cheeks. My father happened to have several barrels of them one year when we lived in Richland county. He sent them to Minneapolis in a car of other apples. The merchant there took the entire carload to obtain those few barrels of Lubsk Queen, paying twenty-five cents per barrel more, for the balance of the car. There is no law now—though there may be before the legislature adjourns—which says we can't have beauty and quality in the same apple and the one which combines both will be the best seller. The color of fruits and vegetables has a value recognized in commerce and the household. There are certain standards and ideals of color to which fruits must conform more or less closely to be assured of popularity and this is equally true of vegetables. A beet that is blood red throughout will meet this ideal standard better than the red and white or yellow flesh varieties. A white sweet corn is most desired but a yellow may be tolerated if distinctly tender and succulent. Yellow fleshed rutabagas seem to be the popular kind and yet the white is quite preferable for table use. Yellow fleshed potatoes are hardly tolerable and red skinned ones are not so popular except for early markets in the city. There is no distinct reason why speckled or dark beans should not be as marketable as any except that fashion says their color should be white. Onions may be brilliantly white, red or yellow and yet be indifferently accepted by the cook. Perhaps this indiscriminate choice arises from the fact

that she tearfully removes the coating that covers the odorous bulb that is always white within. In fruits, too, we have some color vagaries that arise to even greater importance in the field of commerce and culinary art. Our first fruit of the season, the luscious strawberry, comes to us uniformly clad in red and we like it best if the red is full, deep and glossy and the flesh itself blood red to the core. The deep red flesh gives the best color when canned and a much more inviting look than the white fleshed sorts. The bright red or black of the cherry seems to fully satisfy for color. The ideal raspberry is bright red or coal black. Dull colors like that of the Shaffer or Columbian do not seem to meet our ideals as well, even when quite acceptable in quality and size. In currants the red are decidedly more marketable than white varieties, while gooseberries go to the market almost as green as grass. In blackberries no light colored sort has been profitably grown and we accept their blackness as just the right thing. In grapes we have many colors, white, yellow, red, pink, purple and black. If the quality is distinctly good none of these colors are barred from public favor.

The most important color for apples is red. If upon a clear light ground a blush will do but if suffused in bright carmine over an ivory white as in the Lubsk Queen, it becomes irresistibly lovely in the market. While green colored apples are sold in large quantities it is undeniable that all parties concerned would be better pleased if the fruit were full colored red. There is, however, a finish of glossing and coloring of well grown and well matured fruit that will make it very attractive when secured in the largest possible degree. To secure this brilliancy of finish that should be present when harvest comes is a part of the art of the fruit grower. Trees overloaded with fruit, those suffering from insect or fungous depredations, those underfed or choked with drought may not be able to color their crop. While nitrogen in the soil is essential to grow abundant foliage, a soft succulent growth caused by too much nitrogen will retard rather than produce color. Potash, lime, sulphur and phosphates are probably the coloring factors as far as soil elements are concerned. To thin the fruit, feed the tree a balanced ration and protect its foliage from insect and fungous foes, is to prepare for the full maturity, splendid finish and glorious coloring of autumn sunshine, without which the labor of the season becomes partly abortive.

So with fruits and flowers, though it may be only to charm the eye or to please the tastes of fashion, it is well to give some thought to their color. All that which aids nature to its fullest development will tend to give richer, better hues. Our summers are one long succession of colorful displays, beginning with the fresh delicate green of the springtime foliage through the deeper tints of summer to the rich

gold and browns of harvest time. As if wishing to end all this lavish beauty with one grand riot of chromatic effect the forests are changed into marvels of red, brown, yellow, crimson and gold, the hedges and roadsides are filled with golden rod and asters, the skies are a deeper blue. No matter how brilliant or numerous the color gifts of nature may be she always moves in one great blend of harmony, never in discord. When at last the leaves have fallen and winter comes with sparkling frost she spreads over all her mantle of snow, emblem of purity, triumph of harmony, the chromatic union of all colors that brings to the vegetable world the peace of sweet rest.

THURSDAY AFTERNOON.

The meeting was called to order by the President in the Horticultural Building of the University of Wisconsin at 2 p. m.

ADDRESS OF WELCOME.

BY PROFESSOR J. G. MOORE.

Mr. President, Ladies and Gentlemen:—I assure you that I am unable to find words to express the welcome to the State Horticultural Society in meeting here this afternoon. It has been the very great desire with those of the Horticultural Department as well as with Dean Russell, head of the College, to have the Horticultural Society hold its meeting at the College, but for reasons which seem to those who are in charge sufficient, it has not been deemed advisable or wise to hold the meeting here and this year, on our invitation to hold the meeting here, they voted this session this afternoon at the College.

The Horticultural Department has as its aim the advancement of horticulture in Wisconsin primarily, but not only in Wisconsin, but in other sections of the country as well, because we have here at the present time a group of young people who represent various states in the Union. We have them coming from the South and from the East and from the West as well as from Wisconsin and so in the work which we are attempting to do here, we not only see the horticultural problems in the horticultural development of Wisconsin, but more or less of all other parts of the country as well. Not only does the Department attempt to touch along teaching lines the development of horticulture, but also in its research work, and that is a less tangible thing in a great many ways, because like all experimental work, you sometimes start off on something that looks at the time as though you were going to get great results, and before you get to the end of

it it looks like the efforts of the fellow who thought he had a bee tree and after cutting it down found he was mistaken. You must remember this, that a Horticultural Department cannot stand alone, but needs support of the horticultural interests of the state. The Horticultural Department needs the support of every man who is growing fruit. While we are supposed, possibly, to know some things that because of study or research the average fruit grower does not know, nevertheless it is a pretty poor experiment station that cannot learn a great deal from fruit growers, and so we need not only the support, but we need also the advice.

The Experiment Station's part is to work out those problems which are confronting the fruit growers in this state, and in order to do that we have to know what the problems are, and in order to know what the problems are we have to have you tell us what your troubles are, and so we need the fruit grower just as much or more than the fruit grower needs us. We like to do anything which ties us up to the fruit grower, we like to have the Horticultural Society in such friendly relation to us, and it is for that reason that we are glad to see you here to-day, and glad to have the opportunity to welcome you, to look over the Horticultural Department.

There is not so very much to be seen in the lecture rooms and laboratories, and possibly not as much in the greenhouses as you might expect, but these are the tools with which we work. We have through the generosity of our state legislature and through the appropriation of the University officials, I believe, one of the best horticultural equipments anywhere in the country at the present time. While it is not so extensive as in some states, yet in this new building which we are now occupying, we have a chance for development along the lines of teaching and along the lines of research work which I believe is not surpassed now by any state in the Union. That is not anything for the members of the department, the professors and assistant professors and experimenters to brag of, because we get it from the state, but it means that if we are entitled to such consideration, that it is just that much more of a job for us to make good and to pay for what we have got. My excuse for not appearing before you yesterday when I was on the program was because I had this room full of students, and this very afternoon, downstairs in various parts of the building we have about 180 students taking work in horticulture, so we are teaching a great many boys in the state who are going to be horticulturists and after this meeting is over I shall be glad to have you look around through the greenhouses and get some idea of what we are trying to do, not only along the fruit line, but vegetable forcing lines, and I trust that you will find that this occasion has been one that has been sufficiently profitable so that at some future day

we may again have the pleasure of entertaining the members of the Horticultural Society in this building. Not only when you have a session in Madison of the State Horticultural Society, but whenever you are in Madison the Horticultural Department of the University should be at least one of the points that you should strive to visit and look over the work which we are doing. We are always glad to take the time to show people around. So I welcome you in behalf of the officials of the University and the members of the teaching staff of the Horticultural Department, and the students who are specializing along horticultural lines.

The President.—We appreciate this welcome from Professor Moore, and I feel that there is a growing interest among horticulturists in the state in the work of the University in the horticultural field, and I believe that there is going to be a strong coöperation with the department in trying to get at the vital things pertaining to horticulture.

EXHIBITING AND SCORING VEGETABLES.

MR. N. A. RASMUSSEN.

In preparing vegetables for the show room the greatest care should be exercised in putting them in the best possible condition, for a good judge will place a great deal of credit on general appearance.

Let us take for example the carrot; when going to the field to gather for exhibition, one must pull a great many more than are needed so as to have a large number from which to select. If they are to be shown in bunches great care should be taken that the tops are not bruised nor broken, they must be thoroughly washed so that any defects would plainly show. The first point to be considered is the type for they must be true to name. We will not select the largest unless we have them all of a uniform size, shape and color absolutely smooth, with a bright clear skin. Now after all these points have been considered we often find an exhibitor has overlooked a very important feature, the roots he has selected were grown partly above ground leaving this part green from exposure and he wonders why the judge did not consider his exhibit. The same laws should apply to beets, radishes, parsnips, turnips, salsify and other root-crops of this nature. In selecting cabbage many exhibitors pick for the largest heads regardless of type, uniformity in size and quality which should first be considered. In tomatoes we want size but as in all other cases type, color, uniformity of size should come first. They should be smooth, firm and ripe to the stem without a crack or blemish.

In squash, the winter varieties should be large, heavy, true to type and hard enough to resist the point of a knife; while the summer vari-

eties should not be hard as all vegetables should be shown in their best edible condition if possible.

Sweet corn when shown as a vegetable should not be ripe but in the milk stage with plump well-filled kernels, but it must have the type and characteristics of the matured ear.

Exhibiting muskmelons is a somewhat difficult problem for they should be ripe the day they are judged and must not be over-ripe; therefore they must be picked just before the stem loosens. A judge should consider flavor as well as type, size and thickness of flesh. Muskmelons are one of the few garden-products that should be cut when competition is close. Having seen a judge cut carrots, parsnips, cabbage, onions, peppers, squash, pumpkins, eggplant etc., the experienced grower will wonder what he was looking for and at once hustle to the swine department to see if the shoats have been cut up to determine which possesses the best ham or bacon. Unless competition is close anyone familiar with vegetables would not find it necessary to cut them and then melons, beets, rutabagas, and turnips ought to complete the list.

How should vegetables be exhibited to make the best show? In the old-fashioned square peck box, hens-nest rack or on the stair-steps in baskets, crates or other devices that will hide the vegetables from view, with a woven-wire fence in front thereby giving the superintendent in charge an opportunity to visit the race-track and let the public say the vegetable exhibit was a failure.

Let us put them on flat-topped tables where people can see them and you will see as big an improvement as you did in the apple show of our State Fair for 1912.

We used this method at our County Fair for vegetables and I think every one who attended the fair knew we had a vegetable show and it attracted as much attention as any part of our fair.

The writer has often tried to devise a plan for a score card to be used at county fairs and vegetable exhibits but with no success. Perhaps the only essential characteristic common to all vegetables is type, after that one would need to specialize and either have a dozen different score cards or one so complicated as to be of little or no value. This is not true of apples however as each one has characteristics essential and common to all and it would seem to me an apple score card would be of indispensable value to a judge as well as to an exhibitor.

Let us hope that in the near future this Society will see fit to create an apple score card and also if possible a vegetable score card to be used at all county fairs and vegetable exhibits within our state. Although the compensation derived from growing and exhibiting vegetables, from the premium standpoint is not always profitable the

schooling received and the encouragement to grow better goods to equal or out-class that of our competitor makes better growers of us all.

DISCUSSION.

Mr. Atkinson: What varieties of carrots are best for family use?

Mr. Rasmussen: We sow mostly the Chantenay. It is about the best quality of the short horn carrot; it is larger, we consider it the best.

Mr. Atkinson: How is the Danvers for family use?

Mr. Rasmussen: I do not think it is quite as good in all respects as the Chantenay, although it is of the same type.

Mr. Toole: You did not mention the Marblehead squash.

Mr. Rasmussen: The Hubbard squash is so much better than the Marblehead, that the Marblehead has dropped out of the race.

Mr. Barnes: In selecting a soil for a farm or market garden what quality of soil would you prefer, whether heavy clay loam soil, or a light surface soil with a clay subsoil?

Mr. Rasmussen: Light clay subsoil, light, black loam, or real light clay soil I think will produce the heaviest crop; on the other hand, I think for a farm garden a black loam soil is better, does not need as constant cultivation.

Mr. Barnes: What kind of fertilizer would you recommend for a light soil?

Mr. Rasmussen: Barnyard always, on any soil.

Mr. Barnes: Would you prefer well decomposed barnyard fertilizer to any of the commercial fertilizers for market gardening?

Mr. Rasmussen: Yes.

Mr. Barnes: Don't you find trouble with the weed seeds carried in the barnyard fertilizer?

Mr. Rasmussen: I think that is a good thing, it makes us cultivate more. We don't cultivate half enough anyhow.

Mr. Atkinson: Is it necessary to prune a squash after the first squash sets?

Mr. Rasmussen: I don't think so.

Mr. Atkinson: Would not they be larger?

Mr. Rasmussen: Yes, but then they get too big; we would rather have a large number of medium sized squash than to have a few large ones.

A Student: Do you plant your muskmelons in cold frames before setting them out?

Mr. Rasmussen: We do. We use both sod and berry boxes before planting, and I think I like the berry boxes best. It is hard to get a good sod.

A Student: How big do you let them get before setting them out?

Mr. Rasmussen: Six leaves, 4 to 6 leaves. I think it is one of the easiest ways in the small garden. You can take care of them and do away with the trouble of the striped bug.

Mr. Atkinson: What variety of sweet corn is best for family use? Is there anything better than Corey's Early?

Mr. Rasmussen: The Early Minnesota is better quality, but a little later. But if I were growing sweet corn for family use I would not confine it to one variety, I would want three. I would want the Early Corey, and something like the Early Minnesota for second, and Golden Bantam, although we consider the Black Mexican better for quality.

Mr. Atkinson: What variety of muskmelon do you recommend?

Mr. Rasmussen: The Milwaukee Market is taking the lead with us. We did grow the Morril Gem as a rule, but the Milwaukee Market is proving the best melon. I think it is the same melon as the Thomas Hybrid.

A Member: Does this melon stand shipment?

Mr. Rasmussen: Not very well, still we ship to Minneapolis, but it has got to be pretty carefully packed.

THE TRUTH ABOUT LIME-SULPHUR AS A SUMMER SPRAY.

The President: The Secretary is not here, so I am going to change the subject. The truth of the matter is, I do not know the truth about lime-sulphur, and I am going to call on Professor Moore as more of an expert along this line of use of spray materials.

Professor Moore: I am not going to tell you the truth about lime-sulphur either. I am going to try to state the proposition, then I am going to let the other fellows argue the matter.

You all know that it has been a comparatively short time since lime-sulphur, which was originally the old lime-salt-sulphur wash, was brought into use as a spray. Originally it was an insecticide for dormant spray, then later on with greater dilution, it developed into a summer spray, or a spray during the growing period. Now, the reason that lime-sulphur came in as a summer spray, contending the ground with Bordeaux mixture, was because Bordeaux mixture did cause some injury on fruit, and it was to obviate this russeting, or Bordeaux injury, as it is known, that lime-sulphur was brought in as a summer spray material.

There has been a very considerable amount of work done along experimental lines with lime-sulphur, it has probably been taken up by practically all of the experiment stations in the country, and a very considerable amount of work has been done by the U. S. Department

and its experts along the line of working out the formula, the preparation, and so on, in connection with lime-sulphur as a summer spray.

Almost at once when this material was brought in for summer spraying, it was found that upon certain plants it caused serious injury in the form in which it was originally used, and when the commercial product was brought out it was also found that this injured certain types of plants. As a result the U. S. Department officials developed a lime-sulphur which was known as self-boiled lime-sulphur, which was not a boiled lime-sulphur at all, which was not even a chemical combination, but simply a mechanical union of lime and sulphur for use upon peaches and those plants which were injured by the more concentrated, stronger, chemically united lime-sulphur.

Now, while it is true that upon these more tender foliage plants we got some injury, we have also come to find that lime-sulphur as a spray is not entirely what it purported to be at the beginning, that while we were seeking some material which would entirely eradicate the evil influence of Bordeaux injury, that we have found that lime-sulphur does not entirely fill the bill, that there is more or less injury occasioned under different conditions. Now, this discussion, as I understand it, is to be a sort of experience meeting of the different men who use lime-sulphur. We have been carrying on experimental work for some time, the work in the Department has been under the direction of Professor Milward, and also in connection with Professor Jones, of the Pathology Department. I have simply stated the question as to the merit of lime-sulphur as a summer spray and will leave the discussion to the other gentlemen.

J. G. Milward: In view of the limited experience available in Wisconsin relative to trials with Bordeaux mixture and lime-sulphur sprays it is best to make comparisons with reservation. Two years ago the fruit growers near Sturgeon Bay requested the Wisconsin Experiment Station to undertake a comparison trial with the above mentioned sprays, for the control of apple scab and the shot hole fungus on the cherry. It was also anticipated that results would throw some light on the occurrence or prevalence of spray injury. Two seasons' work (1911 and 1912) have been completed. The work has been in charge of the Horticultural Department of the University.

CONTROL OF THE SHOT HOLE FUNGUS ON THE CHERRY

1911.

Method.—A block of 210 cherry trees of the Early Richmond and Montmorency varieties was selected. The trees were about 12 years old, all in full bearing. The block of trees was divided into five plots and treated as follows:

Row 1 to 6 inclusive, sprayed with Bordeaux.

Row 7 to 8 inclusive not sprayed.

Row 9 to 14 inclusive sprayed with commercial lime-sulphur.

Row 15 to 20 inclusive sprayed with self-boiled lime-sulphur.

Row 21 not sprayed.

Formulas used.

1. Bordeaux mixture:—
   3 lbs. copper sulphate.
   4 lbs. lime.
   50 gals. water.
2. Commercial lime-sulphur. 1-40.
3. Self-boiled lime-sulphur. 8 lbs. lime, 8 lbs. sulphur and 50 gallons of water.
4. Arsenate of lead was added at the rate of 3 lbs. per 50 gallons.

Dates of application.

1. Just as buds begin to open. 2. Just after petals fall. 3. Two weeks later. 4. After fruit is picked.

CONTROL OF APPLE SCAB.

A block of 190 trees in full bearing of the following varieties was selected,—Northwestern Greening, McMahon, Fameuse. This block was treated as follows:—

Row 1, check. Not sprayed.

Row 2 to 7 inclusive, Bordeaux mixture.

Row 8 to 14 inclusive, commercial lime-sulphur.

Row 15 to 18 inclusive, self-boiled lime-sulphur.

Row 19, check. Not sprayed.

Dates of application.

1. May 17. Blossoms in pink just beginning to open.
2. June 1. Petals have just fallen.
3. June 20, July 8, July 25.

The same formulas were used on the apple as stated above for the cherry with the exception that the Bordeaux mixture was made according to the 4-5-50 formula.

1912 WORK.

The same formulas were used on the apple as stated above for the same general plan with the exception that the self-boiled lime-sulphur

was omitted. The work upon the cherry was transferred to another orchard of young thrifty trees, three years from planting. The apple spraying was also transferred to an orchard of Northwestern Greenings about 20 years old. This apple orchard during the course of the summer proved to be seriously injured, probably from freezing the winter previous. Practically no fruit set and the entire block of Northwestern Greenings apparently were slowly dying. On account of the lack of fruit and the condition of the trees no results on the apples were available from the 1912 work. The results on the cherries are indicated below.

In 1911 none of the lime-sulphur sprays showed a satisfactory control of the shot hole fungus on the cherry. Observations were made during the months of July and August. The shot hole fungus was exceptionally severe at Sturgeon Bay in 1911. The Bordeaux mixture held the disease in check completely. On August 15 the foliage on the Bordeaux mixture plot was green and healthy. Many trees on both the commercial lime-sulphur plots were partly defoliated and showed but slight advantage over the unsprayed trees. The self-boiled plot and unsprayed plots were apparently in the same condition as regards defoliation from the shot hole fungus.

Apple Spraying.—Apple scab did not begin to develop until about July 25. The disease was not as proportionately destructive on the apple as was the shot hole disease on the cherry. A very noticeable difference in health of foliage could be observed, however, in favor of the Bordeaux plot. Bordeaux injury was severe on the Fameuse variety and present to a less degree on the McMahon and Northwestern Greening. A distinct injury to the fruit was observed on the lime-sulphur plots which was not found either on the check or Bordeaux plots. This will be described by Prof. L. R. Jones during the discussion.

Cherry Spraying in 1912.—The shot hole fungus did not begin to develop seriously in 1912 until later than the season previous. In August the disease again proved serious and caused considerable defoliation on unsprayed cherries. Unlike the previous season's experience the commercial lime-sulphur proved very beneficial in holding the disease in check. Observations early in September showed that the Bordeaux plots were in best condition. The difference was slight as compared to results the season previous. The check or unsprayed rows were nearly defoliated.

CONCLUSIONS.

This work has just begun at Sturgeon Bay and will undoubtedly be continued on improved methods. The speaker can see no benefit in the substitution of lime-sulphur for Bordeaux mixture as a summer spray on the cherry in the control of the shot hole fungus. Bordeaux

mixture on account of its strong fungicidal properties, adhesive or sticking qualities has proven an excellent spray for the cherry in Door county, especially in view of the fact that there seems very little danger of any "Bordeaux injury" on the cherry in this region.

On the apple the spraying problem appears more complicated. During some seasons considerable Bordeaux injury on the fruit is prevalent. This type of injury is apparently obviated when lime-sulphur is used. The question arises, however, is there not more serious danger from other forms of injury with the use of lime-sulphur under field conditions and common orchard spraying practices? Is the method elsewhere recommended of using lime-sulphur on the early dates of spraying, a satisfactory means of avoiding Bordeaux injury? Under this system, will the lime-sulphur retain its fungicidal properties and control the scab until such date as Bordeaux mixture can be used without danger of injury to the fruit?

The above problems relating to summer spraying on the apple are as yet open questions in Wisconsin. Bordeaux mixture will control the shot hole fungus completely and in respect to the requirements of an orchard spray it is satisfactory on the cherry.

A Member. I want to ask you if you had any trouble with Bordeaux mixture in burning or defoliating the cherry trees?

Mr. Milward. I have not seen it.

A Member: I have had considerable experience both with the Bordeaux and the lime-sulphur, not, however, to any great extent with stone fruits. I speak of plums, and my first experience, I have something like ten acres, my brother and I, this was some seven or eight years ago, and the treatment we gave was very thorough. We got rid of the disease and we got rid of the leaves and from that day to this I have been afraid to put Bordeaux on stone fruits of every kind. We were trying to overcome the plum rot. The trees I had were Burbank and leaved out next year.

The President: We have found that Bordeaux used with the strength that Mr. Milward has given you will burn the foliage of the plum, that is, it will not bear as strong a mixture as the cherry. Of course when it comes to plum rot a man has to start early in the season to get ahead of that. If it is not controlled, if the rot starts in while the tree is in bearing, I think it will be difficult to get mixture strong enough to stop the rot, although burning of foliage from Bordeaux must be from lack of care in making the mixture, because you can use ten pounds of blue vitrol, and if you use enough lime you would not have any effect upon the foliage, except perhaps burning a leaf here and there, but not defoliating the tree.

A Member: We put this on when the plums were as large as a good sized pea, and we used six pounds of lime to four of bluestone. That is my experience with stone fruits. I am afraid of it. I will say

I have had considerable experience the last four years in applying Bordeaux and also lime-sulphur. I have put on a great many barrels of the lime-sulphur, both commercial and homemade, and I should like to say here that so far as controlling scab is concerned, I feel no hesitancy in saying that you can control the scab fully as well as you can with Bordeaux and with less injury from burning. We had in the state I came from; the state of Kansas, another disease that lime-sulphur failed to hold in check, that is the apple blotch, which I do not know whether you have in this territory or not. We have very little of it in northern Kansas, in the southern part it is the worst thing we have to contend with, consequently we are leaving the lime-sulphur alone and sticking pretty closely to the Bordeaux and getting pretty good results. I do not think there is any question, at least it is nearly solved in my mind, that apple scab can be held in check by the use of lime-sulphur properly applied.

Mr. Milward: What proportion did you say you used?

A Member: In that case we used 4-6-50, but the last year we used 3-4-50 on nearly all. I would say it was an experiment in which the U. S. Department coöperated with the Kansas Experiment Station and we treated eleven orchards, and in every block treated a given number with Bordeaux and a given number with lime-sulphur. The evidence, so far as we could find out, all things considered, was, with the exception of the blotch, in favor of the lime-sulphur.

Mr. Milward: Do you think the lime-sulphur spray will hold its fungicidal value on the trees over as long a period as Bordeaux mixture will?

Mr. ————: I would not say as to that; I know we get results. I have in mind just now one block in one of the largest orchards in the state, some 1,600 acres in that block, and we had about twenty acres that we handled in our own way, some varieties, of course, showed better results than others. Understand me, I am not saying that the Bordeaux will not do the work, but we have that disadvantage of burning the foliage and the fruit. Some seasons, as you have said, we do not have that trouble, but I believe it is fair to say that in fully fifty per cent of our work we have more or less burning and in four years' work I saw only one instance of burning of the leaves with the lime-sulphur, that was this summer in Milwaukee county. And I have seen so many trees, thousands of bushels of fruit burned with the use of Bordeaux that I will confess I am almost afraid to use it if we have something else that will take the place of it, and I feel absolutely sure that you will have it with the lime-sulphur in the orchard. Mr. Hoover, who is president of the Kansas State Horticultural Society, said he had sprayed his orchard year before last seven times, using Bordeaux to combat the blotch. By the way, the Department of Agriculture have two men in the field in that vi-

cinity and they use lime-sulphur. Mr. Hoover told me that they have very good results. I did not have a chance to go out and see the work, but they have there decided they get best results with the lime-sulphur.

Mr. Kellogg: In regard to spraying plum trees, you spoke of using Bordeaux of a lesser strength to escape the foliage injury. Now, do you intend to apply that to the native plums with the same strength as to European and Japanese varieties? We are growing plums more or less commercially, we are growing largely of the De Soto, Rollingstone, Surprise, and plums of that nature, and we so far have never seen any injury to the foliage on account of the strength of the Bordeaux, and we use the standard 4-4-50 and have never seen any injury to the foliage, and almost every year we have had a good crop.

The President: I had reference entirely to the Japanese plums. The Jap plums are tenderer in foliage than native or European.

Mr. Catchpole: As a grower of apples in Western New York I should like to ask a question. The Professor refers to lime-sulphur, 1 to 33 to control the scab. At what time was the application made and at what period was the scab first developed or shown upon the growth?

Mr. Milward: The applications were made just as the buds were in the pink, the first application was made at that time, and then the next application was made just as the petals were falling, I should judge fifteen or twenty days apart. As I stated, this was done as a sort of field system of spraying, it was not done as accurately as some tests are made. The next date of application was about two weeks after that. The question of course came up, and has come up and it is an important question, as to whether we struck the right time. Your questions suggest, did we strike the right time in relation to the life history of the development of the scab? I do not know. There is a chance that we did not. The work has not been done carefully enough to determine that. I should judge scab would begin here somewhere along from June 30th to July 4th.

Mr. Kellogg: How long after the bloom?

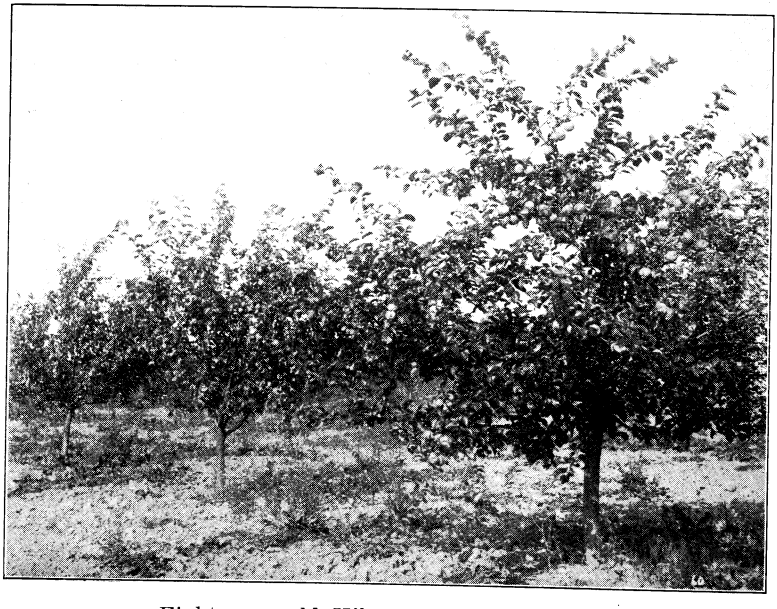
Mr. Milward: Oh, three weeks anyway, after the petals fall. As I stated, it seems to me that it is the important question that must be determined. It might be by repeated applications with lime-sulphur that we might hit that particular time in the development of the scab and do equally as good work as with the Bordeaux mixture, or if the lime-sulphur holds its fungicidal value through the period which the average orchardist must allow to intervene before he makes his other applications, those are the things we do not know.

Mr. Keitt: My work has been entirely away from Wisconsin. Thus, I have no Wisconsin experience to bring up. However, it may be of interest to compare and correlate the results that have been reported from Wisconsin with those obtained in other portions of the country.

Clean Fruit. Poplar Trial Orchard, 1912

De Soto Plum. Poplar Trial Orchard, 1912

A good crop. Poplar Trial Orchard



Eight year old Hibernal Poplar Orchard

My work for the last three seasons has been carried on with the U. S. Department of Agriculture. In 1910, I was in Georgia; in 1911, in Michigan; and, in 1912, in Georgia again. During that time, my own work has been concerned primarily with the diseases of the stone fruits, rather than with those of the apple; but during this period, and prior to it, the Department has been carrying on extensive work in testing out comparatively Bordeaux mixture and the lime-sulphur sprays. Therefore, I think that it may be well for me to run over, in a very brief way, the results that have been obtained in some other sections. First, however, a brief consideration of a few of the more striking advantages and disadvantages of these solutions.

As Professor Moore and others have suggested, the primary reason for the development of lime-sulphur spray is because of the injurious effects that Bordeaux mixture has shown on stone fruits, and to a less degree on pomaceous fruits, in many sections. Let us bear this in mind throughout all our considerations; because we know that, from the standpoint of fungicidal value, there are no spray solutions that are superior to the copper fungicides. None are better in their adhesive properties than Bordeaux mixture. Thus, none are more adequately fitted to control our fungous diseases. However, if the injury occasioned by the use of a spray solution seriously affects its beneficial results a change should be instituted. Thus, the problem of spraying then becomes one of finding a substitute, testing the sprays comparatively, weighing the good and the bad effects of each, and striking a balance. For many sections this work has been done with Bordeaux mixture and lime-sulphur. In others, as Wisconsin, the problem, though the same, is much more difficult, and much remains to be accomplished. With such aims in view, the Department has carried on extensive comparative tests with Bordeaux mixture and the lime-sulphurs. This work has naturally been carried on chiefly in those states where the injuries have been reported as being most serious.

As a rule, the more serious reports of Bordeaux injury have come from the southern, central and eastern sections, rather than from the northern extremities of the United States. Therefore, most of this work has been located in such states as Virginia, Missouri, Kansas, Arkansas and Nebraska. In all these states, as some of the gentlemen have already brought out, the lime-sulphur spray has proved to be as efficient as Bordeaux mixture in the control of apple scab. However, as Mr. Milward has suggested, as we go farther north, in northern Wisconsin and in northern Michigan, there seems to be in the minds of the fruit growers some question as to the efficiency of the lime-sulphur solution. Also, while in New York state, as one of the gentlemen has already told us, lime-sulphur has proved very satis-

factory and has generally replaced Bordeaux mixture, farther north in New Hampshire, numerous experiments by Dr. Brooks, formerly of the New Hampshire Experiment Station, and now of the Department of Agriculture, seem to show that there is quite a question as to which of these sprays is more profitable in that particular section. The results perhaps slightly favor Bordeaux mixture. Therefore, we must, in our consideration, take into account the section in which the work is carried out and the conditions under which it is done.

In my work in Michigan, I was stationed in Oceana county; and there, in the season of 1911, both Bordeaux mixture and lime-sulphur were quite extensively used comparatively by the growers. Although, working entirely on the stone fruits, I did not personally carry on any apple investigations, I had the opportunity of observing the general results of the section. The lime-sulphur proved quite satisfactory in the control of apple "scab," and enough Bordeaux injury resulted to warrant the growers of the vicinity in the opinion that, for that year, at least, lime-sulphur had proved the more desirable spray. It may be that in some other locality, or under the different conditions of other seasons, the results may have been different.

On stone fruits, I carried on a rather large number of experiments in Michigan. I had seventy or eighty plots of peaches, cherries and plums, which were sprayed with various concentrations of Bordeaux mixture and lime-sulphur. It may be of interest to bring up a few points relative to spray injuries.

About the middle of July, plots of sweet and sour cherry trees which had been sprayed three times with Bordeaux mixture, 2-4-50, suffered quite severe defoliation. Careful examinations showed that the defoliation was not due to the attack of fungi. The check trees were earlier badly attacked by "leaf-spot," but did not suffer defoliation at this particular time. The corresponding lime-sulphur plots did not suffer. The case was plainly one of Bordeaux injury. Other plats of different varieties showed varying results, but as a general thing that season, I got a considerable amount of Bordeaux injury on cherries.

As to the relative efficiency of lime-sulphur and Bordeaux mixture in controlling "leaf spot," of plum and cherry, there seemed to be very little difference. One solution seemed to control it about as well as the other. I used lime-sulphur at concentrations varying from 1 to 25, to 1 to 50. Very little injury resulted from concentrations as strong as 1 to 30 on sour cherries, and 1 to 40 on sweet varieties. I used 1 to 40 on the demonstration plats; and, on the sour cherries, had practically no foliage injury. The lime-sulphur gave very good results on both cherries and plums, while a certain amount of injury resulted from the Bordeaux mixture. However, in that same

locality, there were fruit growers who reported absolutely no injury from the Bordeaux mixture, and who are perfectly satisfied with the results they got. It is needless to say that my solutions were carefully prepared according to the recommendations of the Department.

Thus, it seems to me that all of the discussion that has been brought out tends to emphasize the fact that we cannot generalize from the results which are secured in one locality in one year, or even in a series of years. The conditions vary so much from state to state and from section to section that it is impossible for us to carry our work from one place to another and expect to get absolute duplication. The results of experiments repeated upon the same trees, and in as nearly as possible the same manner, may vary much from year to year. There are not now sufficient data available to justify any sweeping recommendation as to a choice between Bordeaux mixture and lime-sulphur for apples, plums and cherries, in certain limited doubtful sections. Therefore, it seems to me that, especially in those sections where it is most difficult to determine surely the relative values of these sprays, the only logical way for the fruit grower to secure the best results is for him to make a special and intelligent study of his own orchard and of the different varieties in that orchard. The men of a locality must coöperate, must work together, toward solving the individual problems of their community. It is impossible for the plant pathologists to go to every locality in the different states, and work out all of these questions. It is, therefore, necessary that the individual fruit growers coöperate with one another, and, with the aid of such institutions as the state experiment stations and the U. S. Department of Agriculture, work out together from year to year the details of their own problems.

A Member: Do you use arsenate of lead?

Mr. Keitt: Yes, in the case of the plum and cherry, we use arsenate of lead with the first two applications. The first application on the plum is made immediately after the falling of the petals, the second application about two weeks later, and the third about a month before the fruit ripens. In the first two applications, we use the arsenate of lead at the rate of 1½ lbs. to 50 gallons.

ASPARAGUS AND RHUBARB.

WARD B. DAVIS, Oshkosh.

The increasing popularity and demand for asparagus the past few years has made its growth more widespread than ever. Not only is it a "local" vegetable but it is shipped in large quantities from the Southern states during the late winter and early spring months.

Thus when we of Wisconsin put our asparagus on the market in April it is no longer the treat it once was at that season of the year.

Unlike many other vegetables, asparagus growing is not as likely to be overdone for it cannot be sown and harvested the same year, but must grow three years to yield a good crop.

To obtain a good asparagus bed the seed should be sown in the spring in drills but not too thickly, and allowed to grow until the following spring when they are taken up, sorted for size and quality, and set in the permanent rows. It is important that the plants be selected as it is well to have the rows uniform when the cutting time comes and they will be more likely to be so if selected.

The rows are marked off about 5 feet apart, and a plow run through where the plants are to be set. We set the asparagus about 2½ feet apart in the row taking care to spread the roots and setting deep enough to cover the crown with about two inches of earth. All that is needed after this is good cultivation and hoeing throughout the season.

We plant the Palmetto variety altogether as it is less subject to rust than the other kinds and still has the good qualities that the others possess. It is large in size if treated properly and very tender in taste.

Our soil is a black loam not very light, but the asparagus seems to give us very good results. We lay our land in narrow beds—wide enough to accommodate three rows of asparagus—so the drainage will be better and the plants kept more healthy.

As soon as the weeds begin to start in the spring we give the rows a thorough hoeing and cultivating, this being repeated several times during the season. Cutting begins as soon as the shoots appear above the ground two inches or more and continues until about the last week of June when we stop selling and the beds are allowed to rest until the spring following. To insure a good crop it is necessary to have a heavy growth of tops after cutting. This could not be obtained if the cutting was kept up too long.

Immediately after the last cutting we top-dress the beds with a good mulch of blacksmith manure if we can obtain it, otherwise some well rotted stable manure is used. Asparagus seems to respond the best to the manure obtained from the blacksmith shop, as the parings and hoof of the horses are very good fertilizers. We sometimes mulch again in the fall if the manure is well rotted. It is not advisable to use anything that is course for a mulch as it will hold the frost too late in the spring and it is the early asparagus that gives the dollars quickest.

We seldom cut the tops off in the fall but allow them to stand until early spring as the snow is held better and the plants more protected. When planting a new bed we usually set lettuce plants between each

asparagus plant in the rows. The shade afforded by the small top is just enough to produce excellent head or leaf lettuce.

An asparagus bed, if well taken care of is good for a great many years. We have at the present time one that is 20 years old and is still giving some excellent cuttings. It is advisable, however, to have a new bed coming on and is well to plant every few years.

The past season was remarkable in regard to the late growth of the asparagus plants. The late summer was very wet and so the plants grew rapidly and large. About the 20th of September we noticed quite a lot of new shoots coming up. We cut them as they would have frozen had we not, and sold thirty-five pounds at 25 cents per pound. In not many seasons is it possible to do this.

We do not ship any asparagus as the local demand is usually greater than the supply. We bunch it in half-pound bunches and tie with a red string. This makes a very attractive package. Last spring we received 33 cents per pound for the earliest and did not sell below 16 cents. The yield was also exceptionally good.

We have tried blanching some asparagus; that is, we have shoveled a few inches of earth over the rows and cut deep as soon as the heads appear above ground. The asparagus is excellent but the market does not wish to pay any extra for the added labor so we do not treat much in this way. We have been planting asparagus more heavily of late and in a few years expect to have a fine plantation. At present our cutting area consists of 9 rows each about 20 rods in length. The receipts from this acreage last season were $265.50.

Rhubarb is grown either from seed or by taking a part of an older plant and making a new one. If the market gardener has not a variety that is entirely satisfactory it is well to get seeds of some good kind and do some selecting until the proper kind is secured.

There are several kinds of rhubarb, large and small, and from a light green in color to one that is nearly crimson. For eating quality most of the varieties may be very good but they might not be salable. Nowadays looks and appearance count almost as much as quality and my experience is that a large wine pie-plant is the best seller. That is what we are looking for.

A rather light warm soil is the best for rhubarb as the early cuttings demand the highest price while the later cuttings are not always salable or if so the price is much lower.

The plants should be set about three to four feet apart as plenty of room is needed for cultivation. A hole is dug with a shovel or spade and if possible a shovel of manure put in the bottom. Then the plants are put deep enough so that the crown will be covered with about two inches of earth. When the seed stalks appear on the plant they should be cut off so that the strength will not be taken away from the plant unnecessarily.

During the cutting season I think it is best to allow the leaves that are trimmed off the salable stalks to remain around the plant, as they shade the ground and help to hold the moisture better. Especially is this advisable on heavy soil that is likely to dry out easily. In pulling the rhubarb care must be taken not to injure the center of the crown. A little side jerk will usually loosen the stalk sufficiently to pull.

In the fall the plants are given a manure mulch to furnish food for the following year. As rhubarb is hardy no protection is needed from the frost.

Prices received at Oshkosh vary from 8 cents per pound for the first on the market to 2 cents or even less later on in the season. While I do not think there is a big lot of money in growing rhubarb, still it is easily grown and with a little care can be made to pay. The varieties which we like best are the Mammoth Wine and the Victoria.

DISCUSSION.

Mr. Smith: There is one point in the paper that I cannot say I can agree with and that is the planting of the asparagus two inches beneath the surface of the ground. It has always been my experience that when the asparagus is planted so close to the surface it has a tendency to dry out in hot weather. Another thing, when planted six inches beneath the surface of the ground it is perfectly protected from winter, it makes a better crown and is better in every way.

Mr. Holsinger: I have had considerable experience, having had four acres of asparagus. I have followed the same system that the gentleman here suggested. Manure was no item other than hauling, as we were close enough to the city to get it and put it on abundantly. We worked this up as fine as we could with the disc or the cut-away harrow. We used the ordinary stirring plow, running it as deeply as we could for plowing. We planted in the row about 15 inches apart, used Palmetto largely, although I have used Bonvallet Giant and I have some of it left. The advantage in planting deeply is that in the first cultivation we barely cover it up, and as the asparagus comes through we can cultivate with the five-tooth cultivator and at cutting time, as it peeps through the ground, with a long knife you can get a long stalk, and many people in town prefer the white to the green. As suggested, it costs more to harvest it that way, and our growers nearly all do plant deeply, as I have suggested.

Mr. Street: It is a great advantage to plant deep. We do not go quite six, about four inches as a rule. I should like to say in regard to cultivating, that we plow early in the spring before the growth starts, so that we do not cut off the shoots, and cultivate until the

shoots begin to come up, then we discontinue that except in the row, but our time to cut is about the first of May. we cut until the 15th of June, or until strawberries commence, then we discontinue the cutting and plow a light furrow, about two or three inches deep over on each side on top of the row, then drag that down.

Mr. Holsinger: We harrow the ground just as carefully as we can until the asparagus commences to peep through the ground, and then in some cases we use the plow, run it shallow and mound up, in addition to having planted deep we mound up. Then as the weeds come through, when asparagus gets cheap, as it did last year, selling at 10 cents a bunch, then the labor problem is quite a problem, and we take a stirring plow and run it as deep as we can. We lose two or three cuttings, but the cost of hand labor to clean it out would be more than we can save.

Mr. Street: You cut when two years old?

Mr. Holsinger: Yes, that is after planting. I have cut in seasons when it is high priced as much as $100 the first year, that is, planting this year and then cut next year. Understand, we are very careful not to injure it. Manuring as I do, and planting as I do, we figure we get a full crop the second year, and we commence cutting sometimes as early as the first week in April, and generally run till the first of July. We have a longer growing season, perhaps, but that is the time to quit, ordinarily, I should say from the 15th of June to the first of July.

Mr. Street: There is one point that was spoken of I think should be emphasized. I find that a great many make mistakes in the planting of asparagus. It is almost impossible for the average farmer to get a good bed started, while it is really very simple. In making a furrow with the plow and putting asparagus from 4 to 6 inches deep, they must not cover it up fully 6 inches deep. If the plants are not extra strong plants, just cover them about two inches deep and then after the asparagus gets up, gradually fill in with the covering.

Mr. Smith: I have been forcing rhubarb ever since I was a boy, in the winter, and the varieties have been Victoria and Linnaeus, and while I have never forced it for market, it has always been for large private families, and I should say that rhubarb forced in winter would pay a man a great deal better than growing rhubarb for summer use. It is very easily forced. It needs a dark place, about 60 degrees, and there is no trouble at all. All you have to do is to throw your roots down, cover them up and give them a little water, about 60 degrees, and in a few weeks you will be cutting rhubarb, and by keeping a succession of roots you can have a good crop all the time. It brings a good price, two or three times what you can get in the summer time.

Mr. Holsinger: My experience is that Linnaeus is the better variety

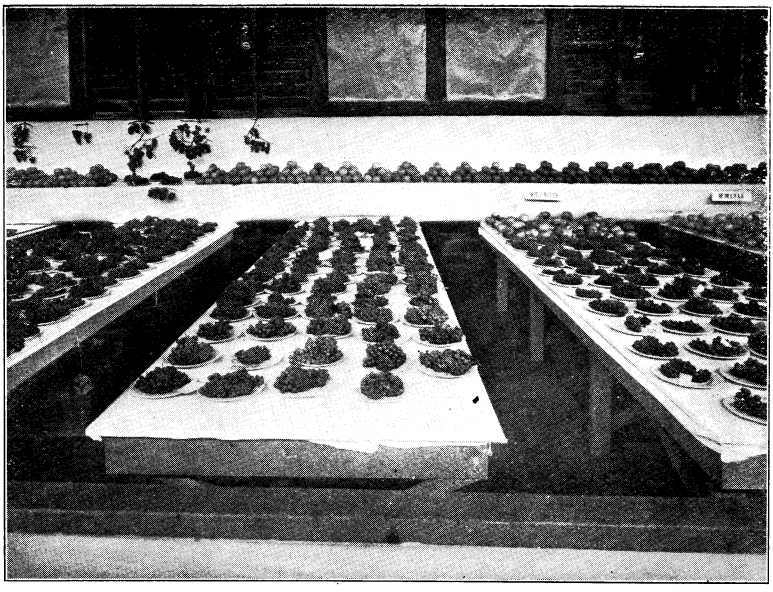
and I would not recommend anything else for home use. But my experience is that Victoria gives a larger stalk, and it is size rather than quality that the city market is looking for. I would not waste very much time with the outdoor growing, when it pays to grow it as we can, in a small space, ordinarily in what would be considered waste places. I have in mind a man in Kansas who had three of those houses, I cannot give you their dimensions, but in January and February they sold over $600 worth. This stuff was shipped about 140 miles to Kansas City, regardless of competition at that point, and the returns were over $600 from the commission man.

The Chairman: There are some points that have not been touched upon in regard to raising rhubarb indoors, especially those who have furnaces in our homes, and can just as well have a nice little treat ourselves, and we could simply take up from the garden any good sized roots. But if a man is in the business of forcing for the market, it makes some difference what kind of roots he has. Take a pretty big, healthy root, and it seems to be full of buds, it will give us a very small growth, and I will say the market does not care for any great extreme in size and something reasonably uniform. It is a disappointment to us if we undertake to raise it, if we have little pipe stems when we might have something of reasonable size. Color makes a great deal of difference, and I find people are discriminating as to quality. We must raise from seed if we want to get any given quality and any considerable quantity. But the seeds are somewhat variable, and therefore I would suggest to dig out some of your plants that suit you best in color and various ways and raise your own seed, sow that seed right away as soon as it ripens. You will be astonished to see how easily the first seed comes up, and from my experience I think you can safely say in one year following that fall you will have roots in good shape to dig up, ready for doing anything, and by all means do not forget to dig up these roots and see that they have had a freezing before they go in. If you would undertake to take them in in a warm place without the freezing you will not begin to have the success that you will have with the freezing.

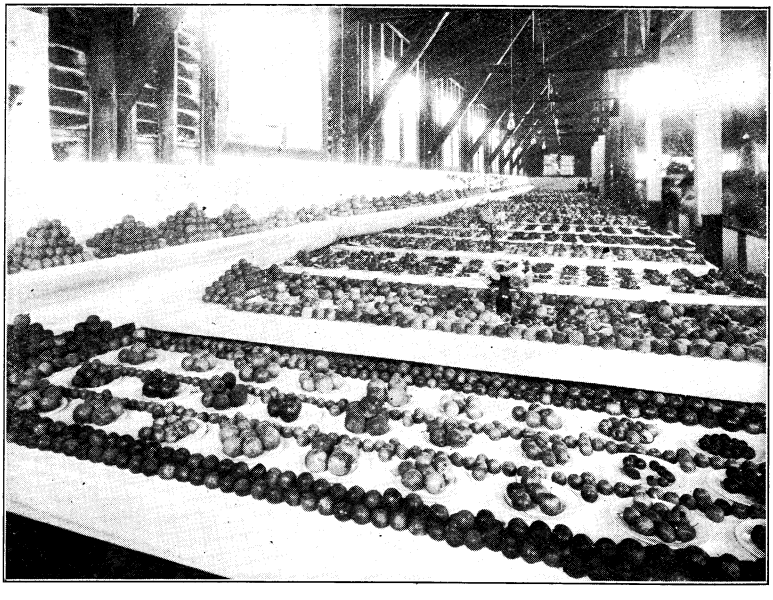
SUCCESSION OF CROPS IN THE GARDEN.

H. O. COOPER, Oshkosh.

The elimination of waste in every possible way is one of the principal features to be looked after in any line of business. For example: the manager of a manufacturing concern strives to have every man's time fully occupied, every machine run to its fullest capacity and above all find a use for all odds and ends of material. The entire profit of some companies is derived from the sale of by-products.

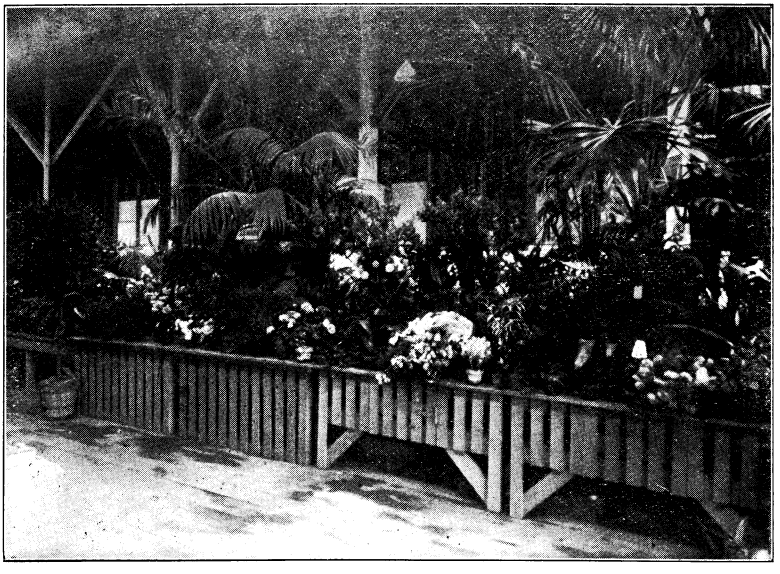


Some of the grapes at State Fair, 1912



A portion of fruit exhibit at State Fair, 1912

Bayfield County Exhibit, State Fair, 1912



State Fair, 1912

Thus our subject for discussion might be put this way 'how make available land do full duty'? 'what succession of crops for greatest profit'? In solving this problem local conditions must first be considered such as texture of soil; amount of moisture obtainable either from the heavens above, the earth beneath or the waters under the earth; also, what does your market demand?

I will attempt to make a few general suggestions which may be modified to suit occasions and perhaps form a basis for a profitable discussion. If, for instance, you have a field booked for a crop of melons, the texture of the soil is somewhat on the light order and you have a market that will take a large quantity of radishes, prepare the seed bed early and sow radish seed broadcast, and when time to plant melons mark and plant. There will be plenty of radishes between hills and if any are not marketed they may be given the cultivator treatment along with the weeds. On the other hand if the soil is inclined to be a little heavy I think it better to prepare a seed bed just before planting the melons and be on hand with the cultivator soon after.

Early plantings of radishes or spinach will be harvested in time to fit the ground for peppers, eggplant or late tomatoes. And right here I would emphasize the importance of having the soil thoroughly worked each time a crop is planted. Not that it is wise always to plough the ground for a second crop, though under some conditions it is better.

The early bunch-onions from sets may be grown between the rows of early peas and will be out of the way before the peas fully occupy the ground; the peas, in turn, are usually harvested in time for a late planting of beets, carrots or sweet corn. In fact I have known beets to do exceedingly well planted after taking off a crop of second early peas. The peas were picked for local market while the vines were utilized for cow feed.

Late cabbage plants are transferred to the field at about the right time for planting winter radishes or rutabaga. The white turnip may be planted after the later peas or early potatoes. I have in mind an instance when squashes were planted about the middle of June, in a patch of early potatoes planting an occasional hill of squash seeds in every fourth row of potatoes. A month later the potatoes were all dug and the ground thoroughly worked between the squash plants and turnip seeds planted. In spite of the fact that the squash vines made a large growth and produced a good crop of squashes, the turnips also did quite well yielding a profitable crop.

The old strawberry patch when plowed as soon as profitable picking is over may be utilized for rutabagas, buckwheat or corn for fodder. Late cabbage or celery will make good here if the supply of moisture is sufficient. Some grow celery after onions. This is done

by using every other row of onions for bunching and setting celery plants in these spaces as fast as the onions are taken out for market. I have known a very profitable crop of celery to be grown in cold frames after tomato plants had been transferred to the field. The celery plants were set about eight inches apart each way thus eliminating the expense of boarding or banking.

Rye and vetch may be sown in the cornfield at the last cultivation and will make a good growth after the corn is cut, providing an excellent cover crop during the fall and winter. In closing I would emphasize the importance of having the land covered with some growing crop in the latter part of the season. Plant corn, buckwheat or turnip seed; it is even better to let the weeds grow than to have the land bare.

Mr. Palmer: Do I understand you to say that you sow the celery in with the corn?

Mr. Cooper: No, that is the little vetch sown in with the corn.

Mr. Toole: I should like to ask if you find the garden itself a paying proposition?

Mr. Cooper: Yes, we do. We find a good market for a certain amount of garden peas and they do not stand alone, we always have another crop. Take them off, put in another crop. It is only half the season that they are on the land.

A Member: What varieties do you raise?

Mr. Cooper: We raise a few of the very early, the Alaska first, because the market demands an early pea, and then we go on with the Gradus for second.

Mr. Rasmussen: The Stratagem is about the best for a home pea.

FRIDAY MORNING.

CO-OPERATION.

B. H. HIBBARD, COLLEGE OF AGRICULTURE, U. W.

Wisconsin is not one of the greatest of the fruit growing states, yet more fruit is grown here than can be successfully and economically marketed with the present system for doing such work. Two-thirds of a century ago, one of the greatest of the English scholars, John Stuart Mill, declared that the great problems of production were solved, that what remained was the solution of the problems of distribution. Since that time, we have done wonders in solving again and again the recurring problems of production. Distribution, that is

the sharing of the products, is still confronting us with hard, knotty questions. Why does the producer get so little, why the merchant so much is baffling to the farmer and fruit grower.

We have developed all manner of efficient and even unique methods of manufacture and of transportation, and yet for some strange reason the gap between the producer and the consumer is as great now as it ever was. There are some good minds at work undertaking to solve this, and they get frequently very good solutions, very good, for one locality, but no one has yet hit upon any one process that has solved the whole riddle.

In the city of Des Moines, Iowa, a very much advertised city of late years, they have been undertaking to solve the question of marketing, and they have succeeded fairly well considering the amount of time and effort that they have put upon it, and yet in that city, during the past autumn apples were selling at the commission houses at $4.25 a barrel which had about one week before been purchased in the Ozark Mountains, not more than 250 miles away, at 75 cents a barrel. Des Moines has been heralded far and wide as the city that has as its motto, "Des Moines does things," but the Des Moines people are paying over five times as much for apples as the farmer in a neighboring state receives for them.

Down in Topeka, Kansas, apples were retailing,—various varieties and qualities,—at 25 to 50 cents a peck. Topeka is not a very large city, you know, but it is a little too large to be supplied with apples from the immediate growers right around the outskirts of the city. That was the price which the consumer was paying in Topeka, yet you need not ride very far out of Topeka to come to some pretty good orchards, where apples of the same quality were being sold at 10 cents a bushel. The distance was not great, the length of time which it would take to get the apples from the orchards to the retail dealers of Topeka was not great, it could be done almost by team, while by automobile and by railroad it was very simple. Blame is frequently centered on the railroad, but it is not the railroad that is primarily to blame. It is that intangible, that difficult gap, that chasm between the producer and the consumer which has so long existed. The bridging of that gap promises more to the producer and to the consumer than probably any other one thing.

Our Department of Agriculture has rendered magnificent service to the agricultural people for years past, and yet, the one burden of their song from the establishment of the Department almost to the present—they are just beginning to change a little—is, how to produce more, how to grow more corn, how to grow more cotton. Well, you know we grew more corn this last year, and the aggregate value of the corn grown in 1912 is appreciably less than that of 1911. Who profits by it? Possibly the eater but not the grower. He has less

out of his bumper crop than he had out of a very moderate crop of the preceding year. They have told the South how to grow more cotton, and in the year 1911 their crop was worth decidedly less than it was in the year 1909, when it was quite a poor crop. Making two blades of grass grow where one has grown before may be beautiful in sentiment, but finding a way of disposing of one blade is fully as necessary as the production of the second.

The best solutions of this difficult problem are those that have been made by the farmers themselves in the nature of coöperative movements. Some of the greatest of these are found in the grain growing districts. The farmers of Iowa and the Northwest, not so much in Wisconsin because Wisconsin is not a great grain selling state, sell vast quantities of grain. They have organized coöperative companies, and have been so successful that, with pardonable exaggeration it has been said over and over that of the 300 coöperative elevators in Iowa there has not been a single failure. As a matter of fact, there are a few that have gone out of business; they have never become bankrupt; it is almost impossible that they should. There are some 300 coöperative creameries in Iowa; they are almost uniformly successful, although many of them in the past for one reason or another have ceased to exist. The coöperative elevator grows up and flourishes in the district in which there is a great deal of grain for sale, in the districts in which farmers are interested in the grain business, in other words, in the district in which they think in terms of grain growing and grain selling, while in districts where this is not the case the coöperative company for the handling of grain does not flourish. The same is true of the coöperative creamery. Where men are primarily interested in cows and dairy products they can organize and can carry on successfully the coöperative company, because they are concerned about the prices of milk, butter and cheese. Where they have a farm with two or six cows, and where the sale of dairy products is incidental it is almost useless to ask those people to come together, form a coöperative dairy association and maintain it, because their interests are not sufficiently great in that line of business.

In view of these facts, is it any wonder that in states like California, Oregon, Washington, Idaho, Colorado, and so on, the coöperative fruit growers' associations are much more numerous and for the most part larger than they are in the middle states? Again, in the East they have learned their lesson from the West in this regard. Why is it that New York coöperative companies are learning of those in the West? No doubt because there are so many fruit growers who are general farmers, who are interested in grapes and apples and strawberries in a rather incidental way, few of whom make it their life business; but in the Basin country and on the Pacific Coast, is found

the fruit farm in its purity. There is where the fruit grower must have an income from fruit or nothing, and there is where whole communities are found growing perhaps the same kind, or at most a few kinds, of fruit, such as in the Hood River Valley country, and to a smaller degree in the raisin growing districts of the San Joaquin Valley, and there are found the very best, the very highest type of fruit growers' associations. We have a few in Wisconsin, of a high type, but it is in the West that they have reached the highest degree of perfection. The impression one gets in going amongst the western fruit growers is that so far as the material affairs of life are concerned, they are interested almost exclusively in fruit growing. They have very little live stock; they do little general farming, they grow fruit. Such men will go into a company, learn the fruit business, and comply with the requirements of the association to which they belong. Probably you happen to know that the Jonathan apple that took the first prize a year ago last fall at the great Denver Apple Exposition was grown in the State of Iowa, and it was the fruit of the Middle West put in competition with the western fruit. Michigan and Wisconsin fruit, Illinois and New York fruit will nearly always rank very favorably in almost everything with the exception of color, with the fruit of the West. The great drawback of the fruit grower of the Middle West is how to get it on the market. With us, it has to be put on the market within a few days. The market is not very far away in miles, but to the man with a very small amount of fruit, a hundred miles, or even fifty, is a long way.

Again, until the fruit business is developed further than it is through this section of country, there is the great lack of uniformity; the great lack of community of interest, whereas in the West whole neighborhoods go into the growing of one or two kinds of fruit. For example you can find whole valleys in the West where the main business is the Jonathan and Gano apples. The dealers say, "There is a market, the companies we are dealing with handle those kinds, and we know what they will bring. If we introduce others, our buyers do not know them so well, our coöperative companies do not know them."

If you have studied the census figures you will find that the quantity of fruit has hardly increased in ten years, in spite of the fact that we want more fruit, as evidenced by the prices we pay, and by the fact that there are 21 per cent more people in the United States than at the preceding census. These facts furnish a splendid outlook for the fruit grower. But no wonder that he mistrusts, knowing so well from bitter experience, the difficulties of the market.

Some Iowa farmers went to Utah a few years ago, went into a good fruit country, but they were pioneers in that valley. They planted excellent varieties of apples, particularly the Jonathan, and after a few years had some hundreds of bushels of apples for sale. They were,

however, farmers rather than fruit growers; they were growing at that time wheat and oats and barley as their main crops. There was no coöperative company in their valley, and they knew very little about the difficulties of the market. Hiring some expert packers they put their fruit into boxes and carried it to town and sold it for one dollar a box. At the very same time, on the very same day, in another valley only a little distance from there and by no means with any advantage over them so far as nearness to market was concerned, a coöperative company which had been in existence for four or five years and was well organized, was marketing the same kind of apples for $2.00 a box instead of for $1.00. The only visible difference was the difference in the method of getting them onto the market.

An interesting little instance happened in the Hood River country. Hood River apple orchards are not very old as yet. Some six or eight years ago, when they were quite new, they already had a company so well organized, as to require every apple grower to employ some one other than himself or his own family for packing apples. They graded and packed with such care, that almost before they knew it they had sold themselves short. They went over into another valley where the farmers were unorganized and brought apples back to sell to their own people in the little towns of Hood River county. And they bought the same kind of apples as they had sold and at a price low enough so that they could pay the freight and retail them in their home towns. The retailers could not buy of local orchardists because they had learned the lesson of the added value of the very same commodity graded and packed properly for the market and sold with as little friction, that is to say, as little expense as possible.

There are difficulties in running a fruit growers' coöperative company in this section of the country. The main difficulty is this, that we do not have as many exclusive apple growers, we do not have as many exclusive fruit producers, we do not have enough of the business concentrated around one town, in one county, to furnish the basis of organization for a company that can maintain permanent headquarters with a manager and pay him throughout a long season, as they can in those distinctive fruit growing sections. Nevertheless, with a little unselfishness, a little self-sacrifice, it can be done. In almost every instance where farmers have succeeded coöperatively, it has been because somebody was willing to do work for the good of the community and not for a pay check at the end of the month. It seems to be almost necessary that some one make of himself and his time a considerable sacrifice. And why? Because business on the competition basis is done for the money there is in it, ordinarily, to the man who is doing the work. For fifty or one hundred or two hundred farmers to get together and undertake to do business on a no-profit basis, and that is what a coöperative company does, it means

that you have either got to hire this work done, or somebody will have a large amount of work to do for a small remuneration.

The Grange a little less than forty years ago had this country dotted over with coöperative concerns. In the grain belt they had coöperative elevators, over half the elevators in the state of Iowa being owned by them. Almost every one of them failed, and the failure was due mostly to one thing, incompetent management. They did not understand that a man to run a business such as the grain business of the town or a store, requiring ability of special character and of high order, could not be had for the price of farm labor, plus the cost of boarding in town. They thought if they paid a man forty dollars a month, whereas a farm hand was worth $20 a month, that they were paying him well, but the fact was that he was in competition with a $100 man, and the result was a failure. So the coöperative company must have, first the self-sacrificing support of some of its own members, it must appreciate the fact that when a manager is hired he must be competent and must be paid adequate wages. Judging from the good examples of coöperation which you already have, there is every reason to believe that the fruit growers of Wisconsin can get their products upon the market and get a very much larger part of the prices paid by the consumer than they have ordinarily done heretofore.

Mrs. Turnbull: Can any one give any coöperative experience in the marketing of bush fruits, which are so very perishable?

Mr. Richardson: Our experience in Sparta has been extending over something like sixteen years. We started there in 1896, and we ran ten years under the original by-laws and constitution. Then we reorganized in 1906, and to tell of our ups and downs would take quite a time, but we have been quite successful, I think, in marketing our fruit and still retaining our membership in the association. We have now something over 300 members, stockholders in our association, it has been incorporated under the state laws of Wisconsin, and we handled this year something like $50,000 worth of small fruits. On the start we had quite hard work to get the growers interested in our association. We find this, that the difference between the producer and consumer could be much more readily decreased if the producer would have more confidence in this coöperative movement. We found, since we have been there, that there are some growers that are a little suspicious of us, and they would rather sell to us as an association, or sell to an outsider, than to turn their produce over to us and let us handle it and take what we get. In fact this year, on one carload of produce alone I made about $200 in buying it from the producer, because they wanted to sell and of course we were there to buy it; we would rather buy and we had to buy the product; we do not want to lose anything, and we bought it at their own figure; we made something over

$200. Now, if that same producer had delivered that carload of product to us, "Here, take it and give us what you can for it, allowing yourself a reasonable commission," they would have been at least $175 ahead. I think that that is one of the greatest troubles in these organizations, they do not have confidence enough in their organization or the management. I am quite enthusiastic upon this question of coöperation myself; it is a sort of hobby with me. I have been manager of the association for seven years, and we have been fairly successful.

Mrs. Turnbull: How long did it take you to get started? Did you accomplish anything the first year?

Mr. Richardson: The first year, in 1896, we had quite a hard time to get the growers interested. We first incorporated under the state laws with a capital stock of $200, and I took my horse and buggy and rode around five days trying to get members interested so that we could ship in carload lots. At that time our method of organization was very crude, and all we wanted was to get enough of them banded together so that we could ship in carload lots. We did quite a little business, but we did not restrict anybody from shipping to any place that they wanted; they became members practically in our organization, but it was an organization coöperative in name only, it gave the members the privilege of selling where they were a mind to but if, they shipped to certain cities they were obliged to ship themselves. We charged at that time a certain per cent loading fee. Since 1906 everything is turned over by the producer to the manager of the association. The producer gets receipts for his produce, and the sale is prorated that day to the purchaser according to the grade which they bring in. In 1906 we started out with about 150 members of the whole association.

Mrs. Turnbull: How did you have a meeting, a mass meeting of farmers?

Mr. Richardson: We called a mass meeting to start with, notified all the growers to be at that meeting and then the organization was talked about and plans formulated, and our by-laws were formulated previous to this by certain enthusiastic parties and they were brought up and read article by article and section by section and adopted by those present. All those wishing to join signed the articles of incorporation. That was our first organization.

Mr. Palmer: What did you charge per share?

Mr. Richardson: Two dollars per share.

Mrs. Turnbull: At what time of year did you start this movement.

Mr. Richardson: The first year we started to agitate the question in the winter. We did not make any headway the first year, did not make any organization. Then people kept talking about it, getting

them interested. Next year we commenced a little earlier in the fall and agitated through the winter, so that in May we got our articles of incorporation.

Mr. Barnes: I should like to ask the speaker if in his opinion it would be possible for us to organize a coöperative market, farmers' market, in a town of say 4,000 people, where we are literally robbed by the middlemen? Would it be possible for us to organize a coöperative market whereby we could fetch in our live stock, have it slaughtered and turned back, sold to the citizens, and would it be possible to bring in our vegetables and fruits, everything of that kind, and have it sold directly to the consumer and save at least five commissions and in many cases two good long freight bills?

The Chairman: Let us not get too far away from horticulture.

Mr. Richardson: I think it is possible, it is feasible, it can be done, it is the proper thing to do, but you have got to get the confidence of the producer. The producer has got to risk his part, he has got to turn his stuff over to your manager and say, "Here, take it, I will take what you will give me."

Mr. Palmer: If you were going to organize a fruit growing association, would you recommend selling stock as low as $2 a share, now, with your experience?

Mr. Richardson: Why, yes I would. I would recommend selling stock in a fruit growers' association as low as $2 a share. We now are capitalized at $6,000, it is all paid in. We had a surplus the first day of January, 1912, of $9,000, besides the capital stock.

Mr. Cooper: Have you anything in your by-laws that holds the producer to you after he has signed?

Mr. Richardson: We have this clause: "All fruit and produce must be delivered to the association as the board of directors may direct." Then we have another clause, that upon violation of any of the rules or by-laws laid down by the association the member forfeits his stock in the association and it shall revert to and become the property of the association upon the payment of all moneys advanced by him on the existing par value of the stock.

The Chairman: I should like to make a little comparison, and perhaps other communities may have experienced something along the same lines. It does not seem like so very many years ago when we raised at Baraboo more strawberries than they did at Sparta, probably a dozen years ago we raised several times as many strawberries about Baraboo as we do now. But we have lacked organization and production has decreased, not because of the ability to raise good strawberries in quantities at Baraboo, but because of the ups and downs and uncertainties of the market; therefore, comparing their experience with ours, it seems to me it is up to us at Baraboo to have a coöperative association. We can raise apples there, and we can raise strawberries, and it

seems there is a good chance for a coöperative organization. Other places the same way. The question of distribution is not only the middleman, but the fruit often goes in the wrong direction. The story is told of a man who sold his fruit; I could mention his name, I know the man well; he shipped to Chicago. Then it occurred to him he wanted some choice fruit for somebody, he sent to the commission merchant at Chicago for some choice fruit, and this particular fruit turned out to be a barrel of his own apples. So you see the uncertainties of the present way of distribution. Things go into Chicago and then back into Wisconsin. It seems to me there are many other places in the state besides Baraboo that not only should furnish a better market, but also would furnish a better market through this association and would place the fruit before the consumer with a good margin of profit at much less cost to the consumer, in that case causing many more apples to be used than are now used, with lower prices in many places.

Mrs. Turnbull: There is a great difficulty in knowing where to look for the manager of an association.

Mr. Harris: I think Professor Hibbard touched on a point that comes nearest to expressing the benefits of the association. Mr. Richardson is situated right in a community where their business is strawberry or berry growing, and in small sections, like ours, it is almost impossible to form an organization. We grow a half-acre of strawberries some years, other years we will not have any, another year five acres, and there must be enough to bring about the choice of the people to organize. There is not enough grown there, we have not over 1,000 cases at any one time.

The Chairman: In answer to this suggestion, is it not a fact, Mr. Richardson, that when you started your organization you did not have the number of growers that you now have? You could not have had an organization if you had waited for a sufficient number of growers.

Mr. Richardson: No, we could not. We do not confine ourselves to the small fruit. We handle everything. If one of our members comes there with more than a hundred pounds of cabbage, or a bushel of potatoes, or two bushels, he says, "Here, take it and sell it," and we sell it for him, give him everything we get out of it with the exception of a small percentage or commission, which we figure out will be the expense of running the institution. We have been buying clover seed; we take clover seed from our members, they will turn it over to us and we take it and get what we can for it. We do not confine ourselves to fruit, wholly. The original purpose was for the purpose of marketing fruit, but our business has grown so that we have incorporated a great many other things in there.

Mr. Palmer: Did you ever make an assessment on your stock?

Mr. Richardson: No, in fact, we have dividends right along.

CO-OPERATIVE MARKETING IN MINNESOTA.

R. A. WRIGHT, Excelsior, Minn.

I will give you just a little of our experience in our home association, for it seems to me the ground has been pretty thoroughly covered this morning, and it occurs to me that there is not much left for me to say, but what has been said touches upon our own experience in organizing and growing up.

I am president of our association, the first association in Minnesota, and have been ever since its organization and know its workings from the beginning up till now. We attempted to organize, in fact, some 22 years ago. At that time I was one of the largest small fruit growers and we organized for small fruit only. We were just growing berries. We were situated eighteen miles from the Minneapolis market, and in order to reach that we had either to drive by team, getting up each night at midnight, or ship by express, and in that way our fruit never got onto the market until nine or ten o'clock, so that we were very badly handicapped. I knew something of association work, and secured some copies of articles of incorporation and by-laws and made up my mind we would try and organize, and we began the first year in April. We called a meeting to discuss the matter. Of course many of them were afraid, a great many did not want to put their trust in one man to handle the business, they had many other things to talk over, but we finally did decide, and with the third meeting we organized and I was made president at that time. We had to employ a manager and we employed him in this way, that we would pay $100 a month for three months' service just for handling the small fruit, and with the understanding if the fruit was a failure, that there was no work, there was nothing doing. We hired a young college man that was preparing for work—you see it is hard to get a good man for three months in the summer. We had a little dry weather along in May and we lost our crop, I did not, but others did, so concluded we would not have fruit enough to pay the manager. We did not do any business that year. But we had a fair raspberry crop and we saw that we still had missed it, that we ought to have an association. We had our next annual meeting, which we held in January, elected officers again, and then we made up our minds that we would give it a thorough try out, and we began operations next year. That year we did $5,000 worth of business. That was our beginning. We have had all the trials and tribulations that the rest of you have had in your association work, because the fruit growers seem to be the hardest class of people to get to hang together and trust fully in one another and put their implicit trust in the capability of a manager that will give them the best returns for their fruit, so that we have had them drop out and come back again.

This lady over here asked the question about how we paid our manager and the expenses. That all goes into one expense account, and we only take out what it costs to run the management, we do not put any money by, only when we built our building, of course each person was assessed so much on the amount of business he did with us, and our expense has run from 5½ per cent of the total business to 10 per cent, different years. We have never been above 10 per cent. Now, saying you would market with us $300 worth of fruit, we would take 10 per cent out of that to pay the expense of our business. We adopted the plan of hiring college men as our managers because it was during their vacation after we got to work, and we would be able to get through the business and wind up probably the second or third week in September. It was not just really a success with that, but we tried out three managers in that way and every one of them was a college man. But we have grown out of that, and have grown considerably larger, the past year did a little over $100,000 worth of business. We have now one of our own growers who came from the city, was an expert accountant there, too, and had to give up the work owing to sickness brought on by too close attention to business; he had to get out into the country, so he is making us a thoroughly good manager and we are getting along in much better shape and are much better satisfied. We practically have everyone with us now. I have been kept in as president, probably much for my ability in keeping harmony in the association by talking with disgruntled members and showing them how it was possible to stay by the association, and it has been pretty trying at times. We had nothing to do with apples or anything outside of berries until four years ago, when we began to take up handling apples a little, but we did not make a success of the apples at all the first three years. The past season is the only year that we have done anything with apples that we might say was a success and people are being satisfied.

We started in with the apple growers packing their own apples, same as they did the berries, and we found that we could not guarantee any boxes of apples, or baskets or barrels. But we have used barrels very little out there, it is nearly all box work, use now boxes and baskets, and we would have people come in and we would show them how we wanted our fruit packed and what it must be and if they would put up apples as we wanted them to there would be nothing but No. 1 apples. But when we came to send them out there would come so many small wormy apples and knotty apples placed in the center of the boxes. Two years ago we got an order for a car of Wealthy apples to go to Fergus Falls, and they were bringing $1.25 F. O. B., packed in bushel boxes, all first-class apples. This merchant up there advertised through the whole town that he would get in Wealthys from the home of the Wealthy apple at Lake Minnetonka and made a great spread, and the manager and I put it up to the members, talked to them, explained to

them that they must be packed so and so and we would do the best we could with the second grade in the city. We shipped that car of apples out. The long and short of it was we had to discount $60 off the car for poor apples and the merchant sent us back some of the letters he had received from some people to whom he had sold 10 or 15 boxes of apples, showing there were small and inferior apples in the center of the box.

A year ago we put in one whole day discussing at our annual meeting what we were going to do with the apple question. I was firmly set that we must pack our own apples, a great many others thought that we could not possibly do that, that the best thing to do was to send out west and get an expert apple packer and go around from farm to farm to teach them how to pack apples. I do not believe that the farmer will pack his own apples without putting in apples that the grader or packer that had no interest would not think of putting in for first or second grade. So that finally I carried my point, that we would pack Wealthy apples only. We would try it out this year, packing Wealthy apples in boxes, and the farmers were to bring them in baskets and we to give them their receipt and we packed three grades, and we were fortunate in getting a man that happened to come in there that had been in Hood River Valley and packed apples. He stayed with us a week, showed us how to pack; also the State University sent out a man a couple of days that gave us some instructions, but in two weeks we were packing as good a pack of apples as in the West, and we have not had one complaint this year from a box of apples that we sent out in any way, shape or form, and we believe that we have struck the right track on handling apples, and our Wealthy apples, first grade, brought us $1.45 on an average this past season. You know that is pretty good, from the way apples have been. But from this on we shall pack all the apples that the association handles, I am certain of that. We have our meeting tomorrow and I am perfectly convinced in my own mind that we are going to adopt that plan entirely

Mrs. Turnbull: Do you pack them at the warehouse?

Mr. Wright: Yes, they are delivered at the warehouse, and on a long table running down there we pack our apples; we do it easily, there is no fuss about it and we know absolutely what is in those boxes. Now, first grade apple does not mean that all nice, smooth apples are in that one box, because you have got to have larger and smaller apples, but the 2½ inch apple that we pack in one pack brings just as much as the 3 or 3½ inch when they are all exactly the same.

A Member: What do you do with the culls?

Mr. Wright: Haul the culls to Minneapolis and sell them at about 90 cents a bushel, second grade, $1.25 a bushel. That is an average selling price. Of course, selling expenses had to come out of that, ex-

pense this year was close to 10 per cent of the whole because we still had some arrears on the building.

Mr. Barnes: That does not include the cost of the package?

Mr. Wright: Oh no, each one has to pay for his package outside of that. The association furnishes the package, but each grower has to pay outside of that.

A Member: As the berries come in, different varieties, different grades, where is the inspection of them done? Does that come from the Association?

Mr. Wright: Berries? Why, yes, surely. That question is a little hard to handle, but the manager and his assistant try to keep track of it in a small way, but the way we keep track of it is by the number that goes out on the box, and the invoice slip that goes out with a shipment that no discount will be allowed without the number of the box coming back and stating what was the trouble. When we started out we pooled, everybody's business was the same, they all got the same price. But we quit that in the last three seasons. A new manager came in. The old manager claimed it was impossible to charge back to each man, it was too much work, would not work, and of course the growers got so they knew this, and this farmer would say, "My berries are as good as yours." And we would have half-filled boxes, rotted fruit and all that sort of thing. But we have worked that differently since the new manager came in. When it is reported back here, a certain number in bad order, that is charged back to the man and he is told of it.

THE KANSAS WAY.

MR. W. R. MARTIN.

Mr. President, Ladies and Gentlemen: I am very glad of the opportunity of meeting with the Wisconsin State Horticultural Society to discuss the subject that to me seems the most important of all, before the people who deal with the fruit farm, with the orchard and with the garden. In behalf of my fellow Citizens and Brother Horticulturalists I bring you friendly greetings from the Wathena Fruit Growers Association and also from the Kansas State Horticultural Society.

It might be well to make clear to my hearers just where the body of fruit growers that I represent is located. Our shipping station, Wathena, which is in Doniphan county, Kansas, is just west of St. Joseph, Mo., at the foot of the Missouri river bluffs, on the Chicago, Rock Island and Pacific, and the St. Joseph and Grand Island railroads. These roads furnish our best shipping facilities as they give us access to the wealthy agricultural and grazing districts of the West, Northwest and Southwest districts where little fruit is grown.

The soil of our county seems naturally very rich for producing highly colored fruit of excellent quality and especially is this true of the small fruit and grapes. We believe it is well to be versed in and conversant with all the diseases and enemies that may attack the orchard and fruits of various kinds. We believe it is well that the fruit grower should understand something of the mysteries of soil elements, their digestion and assimilation by plant life, but we believe that it is of still greater importance that the fruit grower should understand how to inspect and properly pack his own fruit and to be familiar with the best markets that he may have a just remuneration for his fruits. These last clauses are the basis on which the Wathena Fruit Growers' Association was organized for instance, a better pack, higher grade fruit, and better returns. After some deliberation on February 18, 1895, twelve growers, of which I am pleased to say I am one, adopted a set of by-laws and applied to the secretary of state for a charter to organize a corporation to be known as the Wathena Fruit Growers Association.

The fruit shipping at Wathena, prior to our organization was in the hands of five or six firms, known as buyers or shippers. These firms sold the grower his crate material, grape and peach baskets, his barrels, etc., on which they made a good profit. The growers did not object to this profit so much, as to the tendency of the shipper to decline the market on the least evidence of a threatened oversupply.

Notwithstanding a hard struggle we lived through the season of 1905, handled the fruit of about thirty growers, and at the close of the year declared a good profit above all expenses.

The spring of 1906 we increased our capital stock and raised our membership to 100 strong, taking in the best growers in the community.

During this, our second year, we handled 33,000 cases of berries, 23 carloads of grapes, 6 carloads of peaches, 56 carloads of apples, making a net profit on the year's business of $5,000. In this net profit the fact is not considered, that all berries were held from 25 to 40 cents per case above the price of former years. It is also not considered that we saved to the growers on crate material and baskets, above $1,200. To illustrate, when blackberries were selling on the market at St. Joseph for 90 cents per case; on the same day, we receipted to our growers $1.25 per case, met our expenses and made a profit above this figure. Our peaches found ready market in Minnesota, Dakota and Colorado points. Our grapes were mostly handled in iced refrigerators, and were marketed as far away as Spokane, Washington.

Each kind of fruit bears its own expenses, its own losses, its own gains, that is, if we sell 10,000 cases of strawberries for $20,000, and make $2,000 above expenses, we will declare a profit of 10 per cent on strawberries.

It is very important that the fruit and truck growers be well located relative to transportation. If they are not located adjacent to some large city market, or unless they have good shipping facilities, such as train service, boat service, express service, the fruit and truck growers are at a great disadvantage. You can readily understand of what vital importance to a fruit and truck growers association it is to be in control of good transportation facilities.

To be successful fruit growers we must be acquainted with the best varieties, same as the stock raiser is familiar with the best breeds of cattle, of horses, of sheep and of hogs. We must also be informed on the enemies and diseases which attack our fruits, likewise, the remedies. In 1906 the grape crop marketed by the association at Wathena was 30 cars, in 1907 grapes were almost a failure, due to a disease known as black rot. It was still more manifest in 1908. Black rot is a fungous disease and may be controlled by proper spraying with the Bordeaux mixture or lime-sulphur solutions. These diseases and enemies come and go and must be studied. The raspberry is attacked by the anthracnose, the blackberry by rust and moth, the plum by fungus and curculis, the cherry by fungus and moth, the peach by the borers and yellows and fungus, and the apple by the moth and fungus and one thousand other things. The fruit grower must be on the alert for all of these pests and must know what to do and when to do it.

The soil elements, the various plant foods, what elements of the earth are essential to the strawberry, the grape, the apple, etc., all of these should have our attention.

You ask a fruit and truck grower of Florida what elements of the soil he must use for the growth of lettuce, for cabbage, for pineapple, or grapefruit, and he is posted. He not only knows what to use, but how much to use, and when to apply it. I believe the time is here when it will pay the fruit growers of the country to give this most interesting subject more of their study.

The cultivation of small fruit requires much attention and is tedious. To neglect it for any reason, even for a short time is often disastrous. For, the cost of cleaning out is not only greater, but the smothering effect often materially injures the plant. Sometimes, as in the strawberries, great injury is done by having to pull weeds, the strawberry plant coming out with the weeds, or being loosened in the ground. The old adage, "A stitch in time saves nine" expresses it pretty well, but it often happens that we cannot take the stitch. If there were no injury from neglect, it would still be cheaper to keep the ground free from weeds. It costs much more to clean out the weeds, than the necessary cultivation, if applied at the right time. There are more points of excellence in the strawberry, than in most other small fruits. The strawberry will adapt itself to a great variety of soils and locations.

We believe fruit growers should coöperate in selling their fruit. The cotton growers of Texas organized to sell their cotton. The truck growers of Florida organized to sell their truck. The fruit growers of the Northwest have organized. All these have found it to their advantage to do so. Through their organization they have both lowered their shipping expenses and raised the price of their product.

Craftsmen and tradesmen of many sorts and kinds have formed themselves into unions and federations. The fruit growers cannot afford to be behind. In the matter of concentration and organization, the more complete the organization the more complete the advantage. Our Wathena Fruit Growers' Association has been fairly successful in its business and has made a good reputation in all the markets where it has done business. We have an organization of about 150 members. The officers of our society consist of a president, vice president, secretary, treasurer and business manager. We have a board of directors of seven members from which we choose the above named officers. We put upon our board of directors men of good judgment, men of recognized business sense and ability. The board of directors holds meetings as often as they think necessary to look after the interests of the association. They provide the grower with box and package material, which by the way, is an item of great saving for the members. The Wathena Association at this writing, has placed orders for about 100,000 berry crate material to be shipped direct from the factory. Before our organization the crate material cost the grower from 3 to 5 cents per crate more. The association provides its members with stapling outfits, with stamps, with which to put their personal stamp on the end of the crate. It helps to provide its members with pickers. It arranges with the trade to handle the fruit the ensuing season, the business manager knows before the fruit is grown where the bulk of it is to be marketed. Arrangements are made for refrigerator cars, office help is employed as bookkeepers, stenographers, inspectors and billing clerks at the shipping station. The business manager and board of directors look after all details of the business having authority to attend to it as though it were their own. Our association is governed by constitution and by-laws. All fruit to be shipped must undergo a rigid inspection, must be sound, well shaped, well colored and clean. It is one thing to grow fruit, it is quite another thing to market it successfully. Fruit growing is a science. Fruit selling is a fine art. In growing fruit one must study climate, soils, locations, varieties, planting, cultivation, pests, remedies, picking, packing, storing and delivering and such things. Hence your directors must be wide-awake, thorough and capable. They must have their hands on the wires, their ear at the phone, their eye upon the market, and both feet in the business. They study the markets, get in touch with them and sell the fruit. An organization will command

more respect than single, individual shippers. An organization will be able to distribute the shipments to advantage, while, if left to separate individual shippers, some favorite market will be overloaded. Again the berry growers have neither the time nor the opportunity to attend to the shipments and keep posted on prices. Again, while many single shippers are working independently it is much harder to maintain a uniform price on fruit than when shipped and sold by the organization or association.

In dealing with transportation companies, you will find it very much like dealing with an individual. They appreciate kind and honest treatment, and will respond to your wants quickly. Never make claim of a railroad company unless you have a just and honest one to present to them. See that your cars are properly refrigerated before loading. See that your fruit is properly loaded and securely braced. Have the agent inspect the car before sealing. See that it is correctly routed. Make all icing and ventilation notations on B/L, and have it signed by the agent, and I will assure you that you will have very little trouble. Our association has never presented a claim for a car of fruit but what was paid.

Does it pay to handle fruit on a coöperative plan? We are realizing today almost 50% more money for our fruit than we were seven years ago when our association was organized, and in addition to that gain we are saving our growers an enormous amount of money in the purchasing of our crate material and other supplies. For example, will say, we paid 10 cts. per crate for berry crates complete, delivered to our station. We were informed by members of the St. Joseph, Mo., Horticulture Society that they paid 14 cts. per crate for the same grade material, shipped from the same mills. They bought theirs through a dealer, we bought ours direct on a cash basis. Since we organized we have handled about 500,000 berry crates. Just figure the difference please. $4.00 on the hundred, which would be $40.00 on the thousand, and 500,000 cases used. You readily see we have saved our growers the net sum of $200,000.00 in the past seven years on crate material alone. Our little city has also used about 600,000 grape baskets during those seven years, which we paid $18.00 to $20.00 per thousand for, while our brother growers on the Missouri side of the river were forced to pay $23.00 to $24.00 per thousand, which would represent another saving of about $24,000.00. Saying nothing of the money saved on barrels, spray material, etc., and in addition to the above savings, we have prorated back to our growers a dividend of about $25,000.00.

Our members own the largest, most modern, up-to-date office building in our city, known as the Fruit Growers Building, which cost $18,000.00. The ground floor is occupied by the Farmers State Bank, Stuart & Bowman Department Store, and our General Office. The second floor

is all offices. Our members have never received less than 7% on their investment. Besides the building stands as a monument to a worthy cause.

Our town is fast becoming a coöperative town. Besides our association, we have a coöperative elevator and a coöperative lumber yard. There is a move on hand now for a coöperative department store. Our banks were quick to realize that coöperation was the only way to reach the business tributary to their town, and keep it from going to competitive towns. In conversation with the cashier of one of the two banks we have in our town, he said that the success of the banks was largely due to the influence and support accorded their institutions by their stockholders, feeling that such interest and influence was for their personal benefit, and by such coöperative effort the banks are not only holding the business rightfully due them from their territory, but it has also had a tendency to place the banking business in many hands, and thereby elevate the business in more respects than one, as a number of stockholders will demand rigid examinations, courteous treatment, and conservative banking. Our banks are giving universal satisfaction, much more so than if their stock was held and controlled by one man, or a few men.

In conclusion; I will say that it should be our ambition to produce the best of fruit, and I know you will agree with me that there will probably never be produced too much No. 1 fruit, and that it is never the best fruit that gluts the market; so let us urge the necessity of packing none but the best. Competition is growing more fierce every year, and we are certainly approaching very near, if we have not already reached, the point where quality is the key of success. With fruit of first quality and carefully packed we need fear no unprofitable results.

APPLE RUST.

PROFESSOR L. R. JONES.

I wish in the first place to advise you that a question was raised last year by Mr. L. H. Palmer as to the possibilities of controlling the apple rust. Not going into the details at all, simply to advise you that through the courtesy of Mr. Palmer the experiment station went into that neighborhood and sprayed a fruit tree for this peculiar disease, apple rust, and succeeded fairly well in controlling it. However, there is no reason to change the general advice given last year, that is, that the apple rust is a disease which passes to the apple from the native red cedars and that the thing to do is to guard against bringing the apple and red cedar into proximity, and especially with reference to the Wealthy apple. I speak of this because of course the Wealthy is an apple which is being planted in many parts of the state, and

one should be very cautious not to attempt to start a Wealthy orchard in the neighborhood of red cedar which cannot be exterminated, or, the reverse, one should be careful not to introduce red cedar as an ornamental tree in the proximity of a Wealthy apple orchard. Understand, this apple rust is not the apple scab, it is a peculiar type of fungous disease which is giving very much trouble in certain limited localities like Baraboo, where the red cedar is an abundant native tree.

A Member: What do you mean by proximity?

Professor Jones: Well, I would rather not have it within half a mile; the rust will go that distance, but ordinarily the disease will not become serious unless it is somewhat nearer than that. I also wish to report another thing. While at Sturgeon Bay, with the large co-öperative association, Mr. Martin, who had charge of the work called my attention to the fact that in their young plantation of cherries a knot had appeared upon some of the young trees, and after I thought about it I told him it must be a black knot, which is a thing to be feared in bringing in cherries or plums from the older sections, and I advised him to exterminate it, cut it out very thoroughly. I did not have time to go over the orchard with him, so he brought down to me last evening some specimen knots. There were a few knots such as this developed on his young cherry trees which he cut out. The knot looks very much like the black knot, but I made a critical examination of it this morning and my conclusion is, from anything I can find, that it is not the black knot from examination, but it is an ugly looking thing, but there is nothing in the cherry trees that it came in to give him concern. Whatever it is, it should be eradicated promptly.

This is on a very few trees in a large plantation, it is not an epidemic, but I would say that it may be in the nature of the development of the crown gall type. But whatever it is, it should be exterminated. I should say regarding black knot that in my judgment the evidence is now that we will not have the trouble of black knot on cherries in Wisconsin unless we introduce it. Then if we are right in that, it is of the greatest importance to those putting out farm cherry orchards that they should inspect and eradicate the black knot. Sooner or later it will be brought in to us. It is very common in the East.

A Member: How does the arbor vitae compare with the red cedar?

Professor Jones: They are entirely different.

FRIDAY AFTERNOON.

SOMETHING NEW IN SMALL FRUITS.

H. B. BLACKMAN, Richland Center.

The longer one works among strawberries the more he becomes convinced that he cannot judge a variety by seeing it one or even two years.

Some kinds vary from season to season to such an extent that one can reach but few definite conclusions about them till he has watched them several years. This is especially true of new varieties. A grower in the East, who has had long experience in growing seedling strawberries, claims that a strawberry does not become fixed in its habits until it is a number of years old. From what little experience I have had, I believe there is much truth in the statement. I usually test a variety for three to four years, that is, if it shows any qualities worth keeping, as it takes that long to determine the actual value. Some of the varieties that I will mention may not be new, strictly speaking, but their value is so little known, that they are worthy of mention in this paper.

STRAWBERRIES.

Highland.

A midseason variety very productive, with dark red berries which hold their size well to the last picking. Similar in some respects to the old Crescent, except the berries are larger and the growth of plants is not excessive. Produced more than double the amount of fruit that Dunlap did under the same conditions.

St. Louis.

Extra early; the past season it was just a day or two earlier than Dunlap. It is a very healthy, vigorous grower, berries average extra large, but are soft and lack color and flavor.

July.

One of the latest and most productive strawberries that I have ever grown. We picked our last fruit from it the past season, July 24, which brought $2.00 per 16-quart case wholesale. The berries are only medium size, but they average up well the season through. Color, light, glossy red; quality, fair; where lateness and productiveness are wanted, this variety is in the lead.

Black Beauty and Grand.

Ripened some of the most beautiful berries which were nearly perfect in color, quality, size and shape. As to productiveness, it would

take nearly a one-acre field of them to supply an ordinary family with what berries they could use. When the berries were at their best the past season, one row ten rods long yielded at the rate of one full quart at a picking.

Meteor.

Plants are vigorous, healthy growers, make an excessive number of plants and should be restricted in their production. The size, color, and quality of the berry are very much like the Warfield. I think it will yield as much fruit too, but am not sure, as I have tested it only one year.

Giant Red Prof.

Season is medium to late. The plants are only moderately productive, berries are medium in size and run small at the end of the season; color, bright glossy red; soft and lacking in flavor.

Fern Dell.

The plant is strong and healthy, making a liberal but not excessive number of strong runners. Very productive, berries average medium to large the season through, color and quality fair to good. Valuable.

Fremont Williams.

Fully as late as July but not so productive. A strong, perfect flowering strawberry which I use to fertilize July. The fruit is large and nearly perfect in color, shape, and quality, while the plants are strong, healthy growers. Will produce twice as much fruit as the Gandy under the same treatment. I consider it one of the best in its class.

Iona Market.

Plants are weak growers, subject to rust; the past season it ripened a fair amount of choice dark shiny red berries. I would not advise planting it.

Baldwin's Pride of Michigan.

About as near a failure as any strawberry I ever tried to grow.

Iowa.

A new everbearing strawberry; a vigorous, healthy grower, making a fair number of strong plants, that is, if the fruit buds are removed as fast as they appear, otherwise the plants will fruit at the expense of making plants. Just as soon as the young plants are established they will commence to blossom and fruit and continue to fruit till freezing weather, not a few scattering berries but the plant seems to load itself with fruit. The fruit produced in the fall does not seem to affect the plant any when it comes to fruit the next season. The proper way is to remove all fruit buds until other varieties are about through fruiting and then let that commence. The color, quality, and size of the berries are about like Dunlap.

Americus.

With me it does not seem to prove as healthy or vigorous as the Iowa. Should not care to recommend or condemn it on one year's trial.

King Edward's and Ohio Bay.

Both were a disappointment.

RASPBERRIES.

Plum Farmer.

One of the best blackcaps ever introduced. Stood a test of 40° below zero last winter without any protection. Came through in the spring, alive to the tips. It is without a rival when it comes to vigor, hardiness and production.

Hoosier Blackcap.

About the same as the Kansas. Perhaps a better grower and hardier.

Munger.

A large late blackcap, not hardy and subject to disease.

Early King.

Stands in the lead among the red raspberries; went through the hard winter last season without any protection and ripened a fair crop of fruit while other varieties like Cuthbert were killed to the ground. For hardiness, productiveness, and freedom from disease it is hard to beat.

Eaton.

Canes, weak growers; fruit large, irregular, and seedy; fairly productive and quite hardy.

Idaho.

I can see no difference between this and Eaton.

Herbert.

A large, red raspberry introduced from Canada. I think it superior to Cuthbert in vigor, productiveness and hardiness. Has to be given some protection.

Shippers' Pride.

Very vigorous and hardy, but not productive. Berries small and soft.

Superlative.

Sent out by a firm in Holland, Michigan, as one of the very best. They also claimed to have imported it from England, but it was Ellwanger and Barry of New York who really imported it from that country. Worthless, don't plant it.

Sunbeam.

This new red raspberry comes from Dakota. One of Professor Hansen's selections out of the thousands of seedlings grown at the Experiment Station. The little I have seen of it impresses me that it is valuable. Berries, large, dark red, with a fine flavor; canes, hardy and vigorous.

GOOSEBERRIES.

Carrie.

The bush is a strong, healthy grower so far free from mildew and almost free from thorns. Size and color of the fruit about like the Pearl.

Carman and Portage.

Mildews so badly with me as to be worthless.

CURRANTS.

Perfection.

I have tested this grand new currant five years and the longer I grow it the better I like it. Extra large size and tremendous production. A crate of these can be picked as quickly as a crate of strawberries. Last season while other currants brought only $1.00 per 16-quart case Perfection brought $1.50 per case with a demand far greater than the supply.

Giant Red.

The bush is a more vigorous grower than Perfection, also holds its foliage better, and to all appearances, I think it will rival Perfection for first place.

The President: The paper is now open for discussion.

Mr. W. A. Toole: I should like to ask if the ever-bearing strawberries, or fall bearing, are a profitable proposition commercially?

Mr. Blackman: I cannot see any reason why they should not be. The important thing is if we could irrigate, because we generally have a dry spell just after the other varieties quit their fruiting. If we could plant them so that they could be irrigated, I know that they could be profitable, because their productiveness is equal and the quality is as good as the Dunlap.

Mr. Toole: In order to have the crop in the season when you want them, would you pick off the green fruit, or would you let them make a full crop all through the season?

Mr. Blackman: I would keep the fruit buds cut off in summer before other varieties quit fruiting. They could not very well stand three crops in a season.

Mr. Irving Smith: How large is the fruit?

Mr. Blackman: About like the Dunlap.

Mr. Toole: Those Iowa Ever-bearing that you recommended, are they self-fertilizing?

Mr. Blackman: Yes.

Mr. Toole: Do you know of any other good one that is ever bearing?

Mr. Blackman: I do not. I tested out the Pan American and the Autumn, and also have the Americus. The Pan American and the

Autumn I would not recommend, because they make no plants and the berries are too small, while the Americus I have not tested far enough.

Mr. Turnbull: Don't they ripen rather slowly, so that you will have to pay heavily for picking them?

Mr. Blackman: I think not.

Mr. Everett: What variety of red currants do you think is sweetest?

Mr. Blackman: I would name the Perfection.

Mr. Everett: What is the best variety of gooseberry, free from mildew?

Mr. Blackman: Well, the Downing and the Pearl.

Mr. Everett: How about the Joslyn?

Mr. Blackman: I would not recommend planting it because it mildews so badly.

A Lady: How about the Red Jacket?

Mr. Blackman: That is the same as the Joslyn; I would not recommend it. It is a poor grower and mildews. The Houghton is too small.

Mr. Harris: You mention the dry season between the regular picking of the strawberry and this fall bearing variety. Is it not the fact that the Enhance is equal in fall bearing, if you had that condition?

Mr. Blackman: I have never found it so.

Mr. Harris: We have the Enhance and lately the Warfield and Dunlap, they are very productive, profitable. When we have a dry season, followed by a wet season after the other harvest is done, we can get large pickings from them.

A Member: Do you find a decided difference between those that occasionally bear and those that are ever bearing?

Mr. Blackman: Yes, a decided difference. While in these that bear occasionally I question that we get a profitable crop unless we have a small plantation; not so with the Iowa, because they bear very heavily.

Mr. Harris: Is it more so the fall after planting than the following season, after they have borne one spring crop?

Mr. Blackman: I think not, because those plants that set so late, it is so late before they are established that you do not get much fruit out of them. Only those plants that are firmly established do the bearing while next season we have other plants.

Mr. Harris: Is it not a fact, Mr. Blackman, that the standard varieties, such as Dunlap, when they do produce a second crop, that there is a noticeable decrease in the next year's yield?

Mr. Blackman: I think so.

Mr. Turnbull: Is it possible that if you pick off the blossoms on these ordinary plants, they would be late bearing?

Mr. Harris: This second crop on certain standard varieties, means simpy that we have produced one crop and this I understand is on the new runners and the fall after setting in the spring. The Everbearing, as I understand it, is picked in the fall after being set in the spring.

Mr. Blackman: Yes, the first setting we set out in the spring, and they commence to run at the proper time and begin to establish themselves. Just as quick as the young plant is established, it begins to send out fruit buds.

Mr. Harris: With the Dunlap and Enhance, it does not make any difference how good plants we have, provided the conditions are right, we get a second crop. I have not had any experience with the fall bearing, and my question is whether there is a decided advantage for the fall bearing kinds.

Mr. Blackman: There is a decided advantage.

A Member: Which do you consider the best commercial black raspberry?

Mr. Blackman: The Plumb Farmer; in every respect.

A Member: Do you find a marked difference in the matter of maturity? I have understood there was one feature that you get all the berries in one picking, whereas, some others string along.

Mr. Blackman: I do not think so. In our plantation we pick as long or longer than any variety that we ever had. I think perhaps there are half a dozen other varieties that are standard and the Plumb Farmer held up better than any of the rest.

A Lady: Where are those plants to be had?

Mr. Blackman: From any good nurseryman. I believe all nurserymen handle them.

Mr. W. A. Toole: What would you recommend for an early strawberry to get on the market real early?

Mr. Blackman: I do not know of anything better than the Dunlap. All the early varieties I tested out did not prove but a day or two earlier and on some other points they were not as good.

Mr. Toole: Does the Warfield come along about the same time as the Dunlap?

Mr. Blackman: Yes, but the Warfield is not profitable with me. Mine is a very heavy soil.

Mr. Harris: In our section everything has to pass in comparison with Dunlap Warfield and Enhance.

A Member: With this ever bearing strawberry you find you get a good spring yield, same as Dunlap, and then a fall yield in addition?

Mr. Blackman: Well, if you let it fruit in the summer, as I understand your question, why, you would exhaust it so it would not be able to produce much of a crop in the fall.

A Member: If you put out a new bed each year, you could get a good spring crop and perhaps a considerable fall crop?

Mr. Blackman: Yes, that would be all right, it would outbear the Dunlap.

ALL THE HERBACEOUS PERENNIALS WORTH GROWING.

W. A. TOOLE.

Of late years there has been a steadily increasing interest in perennials for the home flower garden, or as an addition to the shrubbery border. While they do not give the showy bedding effects of geraniums for the whole summer, there is a wide variety in form and color and a succession of bloom may be had from early spring to late fall. Most of them are superior for cutting. Many of them are decorative in foliage before or after the blossoming time. All of them are desirable because they do not need replanting every year. It is a mistake to assume that because they live from year to year, that no further care is required after planting out. To get good results they need cultivation the same as any plant. To successfully winter many of them over it is necessary to prevent seed production. All are benefited by some winter protection.

The term hardy is a relative one, depending much on the climatic conditions of the region under consideration. Many plants that are hardy further east or but a little south of here are not so in southern and central Wisconsin, while in the northern part of the state where early snows which hold well into spring are the rule, varieties may be grown safely which are not hardy with us in the southern part.

There are three of the hardy perennials that are so popular and may be had in such wide varieties that separate talks are needed for each of them. These are peonies, iris and perennial phlox.

Of peonies there are hundreds of varieties and I will not attempt to name the best. In general the culture is as follows: Prepare the ground thoroughly and unless it is rich soil, add well rotted stable manure, working it well into the soil. Plant the divisions or young field grown plants in the fall during September or October. Mulch heavily each fall with stable manure. Rake off the coarsest in the spring but leave the balance as fertilizer. When the plants get quite large and old, divide the roots and make a fresh start. Keep the grass from forming in a sod about the plants. While the glory of the peony is not for long, the foliage is ornamental all through the season, and it is an added feature in favor of this plant.

Many acres of peonies are grown to furnish the demand for cut flowers at Memorial Day and later. If the buds are cut just as they

are showing color they may be kept in storage for several weeks and will blossom out when brought to warmth. If desired for cut flowers they should always be cut when just showing color and allowed to expand later. Treated in this way they will last longer.

There are a number of classes of iris, of which we need to concern ourselves with the German and Japanese groups principally. The many varieties of flag or iris commonly found in our gardens are of the German class. They range in color through pale yellow, lavender, and blue or purple and chocolate. A selection of varieties will extend the blossoming period to about two months through spring and early summer. The German Iris does well on moderately rich, well drained soil. Old clumps may be divided and reset during August.

The Japanese Iris are not much grown in the ordinary garden. The flowers are very showy and beautiful and have rather a wider range of color and markings. They require a moister soil than the German Iris.

Every year when the perennial phlox are in bloom their great show of color attracts many people who resolve to have a bed of them, and what is rather remarkable, many of these people remember their good resolutions, and later set out some of the plants. Perennial phlox are easy to grow, doing fairly well in partial shade as well as in the sun. They may be moved during late September or early October or early in the spring. They do not reproduce true from seed although seedlings are not hard to grow. Propagation is by division of the older clumps or preferably from cuttings. Cuttings taken early in the spring are not hard to root in the greenhouse. After the first crop of blossoms have withered the bunches will usually produce another crop of flowers on the same heads if supplied with sufficient water. If it is desired to hold the flowering period till late, the first flower stalks may be pinched off before they blossom and they will throw up branches which will flower later.

To many, the Hollyhock is symbolical of the old-fashioned garden because of its prim stateliness. Like several of the perennials it will often die after blossoming one season if seeds are allowed to form. Seeds sown in June or July will form strong plants for the next summer's blossoming. They may be sown where they are to blossom but I would prefer to sow in a frame and transplant to the permanent location as soon as large enough. They are especially suited as backgrounds to other shorter growing plants, in gaps in the shrubbery border, or along the sides of the house or in front of other buildings. The Hollyhock self sows readily and therefore many people think a few plants have lived for years when in reality they have renewed themselves yearly. They are subject to a rust disease which sometimes damages greatly. This may be controlled by frequent and thorough applications of Bordeaux mixture. As a usual thing they are strictly a garden

flower, though sometimes the whole stalk is cut and used for room decorations. They may be had with both double and single flowers. I prefer the single, although many like the double flowered ones. The Allegheny Hollyhocks are single or semi double and are beautifully fringed and ruffled.

Aquilegias, or Columbines are popular while they last though their season seems rather short. I like the long spurred Colorado blue and white columbine (a coerlea) and the long spurred yellow varieties (a chrysanthea) best but many like the red, blue, and purple European kinds, both single and double. I have never yet found anyone who admired the spurless kind which Burbank claims to have bred up, or down. The columbines are propagated from seed, and it is hard to get the colors true as they hybridize with other species so easily if growing anywhere near together. The seed is slow to germinate if at all old, but will grow quite readily if they can be sown as soon as they ripen. Sow the seeds in frames in May or June if older seed must be used, and lay pieces of unbleached sheeting over the soil to prevent drying out. Remove the covering as soon as the seeds begin to come up. Keep the seeds well watered, watering on top of the cloth. Transplant as soon as the first character leaves appear. Achillea ptarmica, The Pearl, has a double button shaped white flower and is very fine for cutting. It is extremely hardy. It may be propagated from seeds, easily, or by division.

Anchusa Italica, Dropmore variety, seems hardy here and is a desirable kind to grow as it adds variety to the color. It blossoms in June on bushy plants four or five feet tall, the color being a clear dark blue.

Canterbury Bells (Campanula media) are worth while trying to grow although they cannot be called hardy with us as they will often winter kill. Campanula persicifolia seems hardier and is very pretty, especially the white flowered variety. A great many of both the white and the blue ones are sold each year as cut flowers on the Madison market.

Coreopsis lanceolata is another of the perennials which should not be allowed to seed after blossoming. It produces a greater abundance of clear yellow flowers on long wiry stems which are unexcelled for cutting. It will blossom all through the summer if cultivated and supplied with sufficient water. Coreopsis lanceolata is very easily grown from seed.

The Delphiniums or larkspurs are quite well known. There are several species that are hardy. The Chinese larkspur grows to about three feet high. The leaves are finely divided and smooth. This kind ranges in color from pure white through light blue to deep purple, and is quite desirable for cutting as well as a border plant. When cut they will often throw out branches and blossom again later. If

the seed is sown early in the spring the Chinese larkspur will blossom the same season, and if sown later they will blossom by the fourth of July the next summer. Delphinium Formosum grows to five or six feet tall and has coarser downy leaves. This variety is offered in both celestial or light blue, and dark blue or purple shades. This kind is not so suitable for cutting as the Chinese larkspur but is very fine for the shrub and perennial border. Those offered as hybrid Delphiniums resemble the Formosum in general form and color and are adapted to the same uses. Delphinium elatior or bee larkspur is an old-fashioned kind not offered much now. It greatly resembles the Delphinium Formosum but has a brownish black center instead of a white center. It is this fuzzy brownish center which greatly resembles a bumblebee which gives it the name of bee larkspur. There are a number of other varieties of hardy Delphiniums with which I have not had experience as yet. These, like the Aquilegias are somewhat slow to germinate and the soil where the seed is planted should not be allowed to become dry.

The Digitalis or foxglove is rather uncertain as to hardiness but it makes a desirable addition to the list and is worth trying.

Gaillardia grandiflora makes a great show in the garden, blossoming from June till late fall if it has enough water. It is another kind which should not be allowed to go to seed as seed bearing will reduce the flower production as well as lessening the vitality for resisting the winter. In color it varies from clear yellow to nearly all red, and in form from quilled petals to broad flat ones. It is excellent as a cut flower. It is not hard to raise from seed. Some time the main stem or bud of the plant will winterkill, but usually sprouts will come up from bits of the root which remain alive down in the ground.

The Oriental poppy with its great scarlet flowers is probably the showiest of our hardy perennials. It is easy to start from seed but is very hard to transplant. Probably the easiest way for the amateur would be to sow the seed where the plants are to grow permanently. The seed is small and must not be sown too deeply. With some care in shading the young plants after transplanting they may be moved successfully. Old plants are very easy to move if transplanted in August. At this time, just after blossoming, the plants are dormant. A little later they send out a fresh lot of leaves to store food for next springs use. We were never successful in using the Oriental poppy at a cut flower because they would wilt down so quickly until we were told to sear the ends of the cut stems with a hot iron or coal or plunge an inch of the stems into boiling water. This hardens the milky juice which seems to prevent the water going up into the plant.

Pyrethrum reseum is the plant from which Persian insect powder is made. It is one of the hardiest of our perennials, and one of the

prettiest in its season. The flowers are daisy like in form and the color varies from blush white to deep red. There are also double and semi-double forms of the variety. It is very fine for cutting as well as making a beautiful show in the garden. It is not difficult to propagate from seed, and if a particularly fine plant is produced it may be increased by dividing the old plant in the spring or fall. This seems to be one plant that is able to hold its own fairly well against blue grass. We have had a few plants that have been in blue grass sod for 15 years.

Pyrethrum uliginosum or giant daisy is a tall growing, branching plant with white daisy flowers an inch and a half across. It is very desirable because it gives a touch of white in the garden during September when nearly everything is yellow or purple. We have found it hard to propagate from seeds as but few of the seeds seem to germinate, but it may be easily increased from divisions if taken up early in the spring.

Sweet William is another old garden flower that I have always been fond of. There is a wide variety of colors and markings, indeed, no two plants seem to bear flowers alike, and they always remind me of a kaleidoscope by the form and changing variety of their markings.

When the Rudbeckia "Golden Glow" first came to my attention I admired it very much. It is so easy to grow, that while still admiring it, I am inclined to take it as a matter of course like dandelions, and not give it the attention it deserves. There have been different varieties of daisies belonging to the class of our wild ox-eye daisy existing for some time, some of them equal or superior to the Shasta Daisy, but the Shasta Daisy has had so much free advertising in connection with Burbank that it is now well known. It is very showy, the enormous white flowers, measuring several inches across. It is easily started from seed, but the plants vary a great deal and a specially good one may be increased by division.

Another good one of this class is sent out as Chrysanthemum latifolium. It is grown extensively by Turvill Brothers at Madison for the cut flowers and seems to be perfectly hardy. It grows considerably taller than the Shasta daisy and with a longer stem. The side of the flower is about the same.

The Shasta daisy starts to blossom in June and where given a good opportunity will continue through the summer. The latifolium starts to blossom a couple of weeks later.

Another variety related to these two daisies is known simply as the early daisy. Many years it will be in blossom by Memorial Day. It is not so large flowered as the other kinds mentioned, but is of a pleasing form, makes a very durable cut flower, and blossoms very freely while in season. It only lasts for a month or six weeks.

Boltonia asteroides, white or lavender white, and Boltonia latisquama,

delicate pink, are two very desirable perennials that very much resemble some of our wild asters in general appearance. They make large bushy plants and during September they are a showy mass of color. We have never been able to get the seed to grow, but they may be propagated from cutting.

Gypsophila paniculata, or Baby's Breath, with its fine white flowers is fine to mix with other flowers in bouquets. Combined with some of the daisies it makes a beautiful bouquet, as it takes the look of stiffness off the larger flowers.

On the program the title reads "All the Perennials Worth Growing." I have not attempted to name all that are hardy here, simply those that I think it would pay the average flower lover to grow. There are many varieties that are hardy but which seem best suited to large plantings, and there are others that are beautiful, and which are occasionally hardy through the winter, but are not the best for the ordinary flower lover to attempt.

Among our native perennials there are a number that are well worth growing, but I will not treat of them here. Many of them are listed in the catalogs. Among them are Lobelia cardinalis, the shooting star, the various wild asters, the wild phloxes, Eupatorium and a whole host of others.

There are many more things that might be said about perennials. In fact a good sized book might well be written about those suited to Wisconsin. But this is all I will attempt at present.

Mr. Harris: In regard to the peony, where the ground is quite rich, what is your plan to make them stand up?

Mr. Toole: We only grow peonies in rather an amateur way, but they can be very easily staked when growing them in a commercial way. You could run some wire on either side of a row very easily to hold up the heavy heads of flowers from going over into the dirt.

Mr. W. Toole: The fact is they do go down after every storm and it would be very easy with a stake and wire to hold them up.

Mr. Harris: We have a large one that always grows up about two feet and a half tall and when it is heavily laden with blossoms they always go over on the ground in a wet spell.

Mr. Holsinger: One suggestion in regard to the peony, I think it is the finest plant to grow in this country. I wonder how many have practiced the system of disbudding, taking off all buds except one, in order to get a fine one? How many have tried it? Those who have not tried it, you will enlarge them and at the same time you do not draw on the plant for as many flowers. It acts in the same way as if you were to thin out fruit trees and it greatly increases the size of the blossom.

A Member: In tying them up I have often taken a bit of binding twine, wrapped it around rather loosely and in that way you can keep it from swinging clear over.

York this year than ever before, simply have been cleaning them out in a wholesale way. Up until about three years ago very few reliable companies would carry that insurance. After a lot of losses and unable to get insurance, two or three companies were found which were reliable and responsible and would pay losses, but there is a general feeling among evaporator men that it would be absolutely impossible to get more insurance unless it be on an up-to-date construction with either hollow tiles or cement block construction.

A Member: You speak of evaporated parings; what becomes of that product?

Mr. Catchpole: Those have been exported to France in very large quantities. As we understand, those are manufactured into a high grade, high-toned champagne, returned here and some one pays a good price for it. During the past three years, with the very high price for the lower grade apples, quite a quantity of waste products have been used for vinegar, but at the present time we have a state law passed, possibly a federal law, against the using of that for that purpose.

A Member: What is the weight of the evaporated fruit from a bushel of apples?

Mr. Catchpole: With the winter fruit in Western New York, a conservative estimate would be 6½ pounds of the white apples, and about three pounds of the waste product. That would be an average for a season's run. Different varieties vary somewhat. It was supposed for a long time that the Ben Davis would not make as many pounds per bushel by weight as some other varieties. Now the evaporator men are eager to get Ben Davis for two reasons; they really think they get as many pounds per bushel, it is a better keeping variety, makes whiter stock and is liked very much by the dealers.

Mr. Rasmussen: Are the evaporators used for any other fruits than apples?

Mr. Catchpole: Not commercially. The large plant referred to, the De-hydrator, is said to evaporate any product heard of almost without exception. I saw their exhibit at New York four weeks ago. It was a very comprehensive exhibit of fruits, pineapples and all sorts of products. Their argument is that their plants are available for other commodities, other things are available. It might be possible to operate it twelve months in the year as against the few weeks in a year under the old plan of evaporator.

Mr. Toole: I think we are all very sorry that we could not have a man to talk to us about cider and cider products. My neighbor insists that there is no market for vinegar, and they say they do not dare to make it and sell it, because some day some inspector will come along and, no matter how good it was, so far as being good

Yellow Lady Slipper

Trillium

tions are right and the beds are made right, there is no reason why you should not have a good crop of mushrooms.

A fair crop of mushrooms is three-quarters of a pound to one square foot. I have seen places where the beds were made in the corner of a large cellar, the bed being well made and spawned with good spawn. The result of these conditions is that you will get a few mushrooms from the strongest mycelium threads, but the fact that the large body of cold air floating through the cellar and falling on your bed, preventing the weaker mycelium threads to head or knob, they will spread flat over the surface of the bed, indicating fungus.

Preparing the manure for the beds is done in a number of different ways. The reason for this, as a rule, is the quantity of manure you can collect at one time. It takes me ten days to get enough manure for a bed thirty feet long, four feet wide and one foot deep. I spread this manure rather thinly in an open shed until I have enough, and then turn it all into a pile about eighteen inches deep and keep it turned every day for twelve days, always having the pile eighteen inches deep. I use three wheelbarrow loads of good soil to every load of manure and by mixing the soil with the manure every day it obtains an even temperature.

I find sawdust, baled shavings, and short straw, that has been used for bedding the horses, not objectionable when used in small quantities, as these commodities have a tendency of retaining the urine and ammonia. The depth of the mushroom bed varies among different growers, but I believe beds twelve inches deep cover all arguments. In making up the beds, they should be made firm by treading the manure until the required depth has been attained. The temperature should run up to 110 to 120 degrees, and when it cools down and returns to 90 degrees it is safe to spawn. It is good practice to lay the spawn bricks on the bed three or four days before the bed is ready for spawning, the reason for this being that it starts the mycelium into action and also softens your bricks of spawns and saves a good deal of waste when cutting them into small pieces. I cut a brick of spawn into twelve pieces and insert these in the manure one inch below the surface and ten inches apart. The bed should be covered with soil one and one half inches thick about a week after the bed is spawned; this gives the mycelium a chance to get into action. Before the bed is cased over, the soil should be pressed down even all over the surface of the bed with the back of the shovel. Cover the bed over with a thin layer of clean straw until the mushrooms appear, and then remove it. By using Pure Culture spawn, mushrooms will appear in four weeks under proper conditions, and in six weeks you will be gathering your first mushrooms.

The temperature of the house should be kept around 58 degrees. Ventilation is an important point. A small circulation of fresh air is

necessary. The watering of the bed, when necessary, should be done thoroughly with warm rain water at 80 degrees. Watering too often will cause black spots and fogging-off of the pin-head mushrooms. Be careful to avoid over watering.

The question of feeding mushrooms with manure water does not always appeal to the average grower, but from experience I find it to be a great help, especially on heavy cropped beds. I use half sheep manure and half horse manure soaked together for several days, and then drained off, adding 100 per cent clear water, and put into the whole amount one pound of saltpetre. Do not water the bed when it is moist; wait until it shows signs of dryness. Do not allow the manure water to touch the mushroom, as it discolors them.

Mr. W. A. Toole: Have you tried to grow mushrooms in house cellars for home use?

Mr. Smith: That all depends on the cellars. I would not advocate cellars. I would advocate growing mushrooms in a house built purposely. You might get a few mushrooms in your cellar. Many people have started and got some mushrooms, a good many have not got any.

Mr. Toole: With the house which you referred to, is that just for summer culture?

Mr. Smith: No, I would not advocate anybody growing mushrooms in the summer. You can get as many in the summer as winter, but you cannot use them.

Mr. Toole: You have to do some heating in the winter?

Mr. Smith: So far I have not used any heat at all. You can cover your roof so that hardly any cold can penetrate. With the roof so close to the ground you can easily cover that up so that no cold will penetrate. Cover with straw and hay, or anything you want, to keep the frost out, and keep your house warm. We do not use any light at all, perfect darkness.

A Member: What is the average bearing period?

Mr. Smith: The best period for bearing is the first month, then you will get another good run of mycelium and they will yield three or four crops during the next month. You can figure on six weeks good crop of mushrooms. I have two small beds now, one of them is 30 feet and the other is 25 feet, since the 13th of December I have picked 65 pounds of mushrooms.

Mr. Toole: Then you renew that again?

Mr. Smith: No, it has been tried so many times growing mushrooms during the summer time, most people have dropped it, because mushrooms get wormy. Even in the caves of Paris, they get wormy in the summer time. I prefer to get the soil ready in August and by the middle of September you can make up a bed. That is as soon as I would recommend any one starting, and keep on until about the middle of April.

CO-OPERATIVE MARKETING OF FRUIT IN WISCONSIN.

BY JOHN WILLIAM BRANN.

A Thesis Submitted for the Degree of Bachelor of Science in Agriculture, University of Wisconsin, 1913.

Great strides have been made during the past decade in educating the farmer in the production of larger and better crops. At present, national and state governments are turning their attention strongly to the training of the farmer in the problem of the economical disposal of his products. The problem for solution is, how shall these products be distributed and placed in the hands of the consumer in the most economical manner. It is evident that the farmer must show better business ability, and keep pace with changing conditions. He must get away from the feeling of individual selfishness and relinquish the idea that some of his privileges will be infringed upon by acting in coöperation with his fellow workers. Individual effort has accomplished much and will achieve great things in the future, but greater and more vital accomplishments have been effected when men have worked in coöperation.

In the early days there was but little buying and selling. The farmer had but few, if any speculators, middlemen or railroads to deal with; hence more or less of the spirit of independence predominated among the tillers of the soil. Before farming can be on an equality with other business, farmers must learn to finance and govern undertakings more intelligently than they have done in the past. Organization has been difficult with the farmer, but with growing intelligence and denser population, it can now be more readily accomplished. The world's producers have allowed the control of their industry to gradually slip out of their hands, and if they are to retain their just share of the profits and make farming as profitable as other occupations, the spirit of closer business relationship and coöperation must be promulgated.

The future progress of the farmers and their industry must be along lines of coöperation in such a manner as will result in fairer prices to producers and at the same time get products into the hands of consumers at a reasonable figure. Investigations regarding comparative prices received by farmers, and those paid by consumers show a great margin in the transfer from one to the other. The farmers have in the past been building a system of distribution that is both expensive and unsatisfactory and this is the primary cause of the large number of difficulties that now present themselves. The imperfect system of marketing in the past may be illustrated by the frequent liability of fruit growers to sell products for which the con-

sumer would gladly pay a good price. The producer loses in not being able to market his crop at a fair price, the transportation companies lose because they do not handle the business and the consumer loses because he is not able to get the product at a reasonable figure. For every dollar the consumer pays, the farmer seldom gets more than forty cents, the balance goes to the railroad companies and middlemen. In manufacturing and other lines of business we find results not as disastrous as a smaller number of middlemen intervene between the producer and consumer.

Gov. McGovern of Wisconsin, in a message to the Legislature emphasizes the fact that in many cases potatoes selling for ninety cents in the larger cities, brought the farmer only thirty to forty cents. Of the amount paid, the retailer takes 20%, the wholesaler 10%, the jobber 5%, freight 10% and further losses 5%, leaving only 50% to the producer. We see many instances where carloads of apples are sold to wholesalers at 50 cents per bushel which in turn sell to retailers at 95 cents who furnish them to the public at $1.25. Thus the consumer pays 75 cents more than the producer gets. This condition of affairs is grossly unjust to both producer and consumer. With perishable goods we note hundreds of instances of extreme wastefulness in which the producer not only sustains a total loss of product, but as an added loss, has freight to pay.

Retailers often prefer to maintain existing retail prices on fruit of which there is an abundant supply, by resorting to smaller sales. Under such conditions large quantities of fruit may rot, when the people, especially the poorer classes would have been glad to get the product had a reasonable price been charged. Situations like the above are common, vast quantities of good fruit become a total loss and yet prices for such products in the cities are relatively high. Such conditions, coupled with desire for a ready market, better distribution and more equitable prices have stimulated the organization of coöperative marketing associations.

Until about twenty years ago the need for organization, among the producers of deciduous fruit was not apparent, but conditions in this industry soon become as bad as those in marketing other products. The need for organization is becoming more and more apparent each year and many growers will be forced to desert their orchards or organize to secure economical distribution of their products.

The western growers of citrus fruits were the first to organize. Their industry is now highly specialized and is founded on sound business principles. The California Fruit Growers Exchange, with headquarters at Los Angeles, represents a high development in the perfection of fruit organizations. High cost of culture, distant markets, solution of problems of production, transportation, distribution, market-

ing and legislation are some of the factors which induced these growers to organize. As a result of their coöperation, they are able to successfully meet the varying conditions which their product encounters at every step from orchard to consumer.

In the eastern part of the United States the fruit industry is not as specialized as in the west. Fruit growing is largely incidental, markets are closer and, in general, the existing conditions that prevail in the west do not present themselves. These conditions have existed to a large degree in Wisconsin, and to these we may attribute the rather slow development of marketing associations in this state. Wisconsin, however, has two fruit organizations which have been operating for a number of years and are based on firm business principles. These organizations are the Sparta Fruit Growers' Association and the Wisconsin Cranberry Sales Co. These, with others of more recent origin, are discussed in detail in the following pages. The Wisconsin organizations are founded on the strict fundamental principles of coöperation. So far as stock is concerned, all are non-profit sharing associations in which members have equal voice. All are operated at cost and the profits are distributed pro rata after interest on investment, depreciation, salaries, and cost of equipment are deducted.

The Wisconsin associations realize that good management is the prime factor in the success of fruit organization. The association should select a manager possessing thorough business ability and one in whom utmost confidence, as to competency and honesty can be placed. In fruit selling, one must study new transportation facilities, the condition of markets, the standing of commission men, industrial conditions and supply and demand. These duties all fall upon the manager and the efficient fulfillment of these is the chief essential of the success of the association.

Loyalty to the association is also a prerequisite of success. It is when the organization is subject to the severe criticism of those opposing it, that the true test of loyal membership presents itself. Unless the members are loyal at such a time, the enterprise is doomed to failure.

Another element of success that the Wisconsin associations are coming to realize is that it is necessary to maintain a high standard of product. It is to the interest of every one to give his best product and induce others to do the same.

In order to further the interests of fruit growers and farmers in general in Wisconsin and to fulfill the aims of good management, loyality and high product, the Governor of Wisconsin recently submitted a bill to the Wisconsin Legislature which had as its object the creation of a state commission whose duty would be to investigate

and inform itself on all matters relating to the organization of coöperative enterprises, give instruction by correspondence relative coöperative production and distribution and furnish a news-service for disseminating information regarding crops, freight rates, commission men and consumers. Had it been carried into effect, this law would have been of vast benefit to all fruit organizations in the state and also to those growers who contemplate organization.

WISCONSIN FRUIT ORGANIZATIONS.

As previously stated, there are a number of coöperative fruit organizations in Wisconsin. The greater number of these are but recently organized. Two, however, the Wisconsin Cranberry Sales Co. and the Sparta Fruit Growers' Association have been in operation for a number of years. Both have attained marked success but the cranberry association is probably better known over the state as it operates over a larger area and practically controls the cranberry crop of Wisconsin. It has gained further prominence in that it was the first cranberry selling organization and largely through its efforts, cranberry growers of other states were induced to organize.

WISCONSIN CRANBERRY SALES CO.

This organization, the leading fruit association in the state, may be justly accorded equal rank with the great citrus and apple associations of the Pacific Slope. Farmers in the counties of Wood, Juneau and Jackson had been engaged in individual growing and marketing of cranberries for some time previous to the organization of the Wisconsin Cranberry Sales Co. With increased production, it became necessary to secure a wider distribution of product to lessen waste in marketing and to secure a medium through which the economic handling of fruit could be effected.

The Wisconsin Cranberry Sales Co. organized in 1908 at Grand Rapids, with a capital stock of $3500, divided into shares of $50.00 each. Every member is required to own at least one share of stock. Originally every member had one vote for each one-hundred barrels of cranberries sold through the Association, but later all members were given equal voice in the government of the Association. The officers are a president, secretary, or manager and treasurer.

The operation of the Association is not confined to the vicinity of Grand Rapids, but any grower living in the state may become a member by fulfilling the conditions as set forth in the constitution. Mr. J. A. Gaynor is secretary of the organization and it is largely due to his organizing genius that the Association commands its present high rank.

Soon after the Wisconsin association was organized, others were formed, one each in New Jersey and Massachusetts. Later the Wisconsin Cranberry Sales Co., the New Jersey Cranberry Sales Co., and the New England Cranberry Sales Co. united to form the American Cranberry Exchange with headquarters in New York City. These associations united to secure more uniform distribution of cranberries and to stimulate demand for cranberries by advertising. Each of the associations retains its own individual existence. The Wisconsin Sales Co. has no control over the New Jersey Co. should they put in poor berries, but it has control over the output of its own members. The central exchange sells only for the members of the Sales companies. It is possible, through a large central exchange like this, to get a better survey of market conditions, to prevent gluts and in short to effect a more economical means of distribution.

This Exchange was capitalized at $9000 and is managed by nine directors, four of whom are chosen by the New England Association, three by the New Jersey Association and two by the Wisconsin Association. All the business is handled by the Exchange which at present controls the sales of 80% of the cranberries grown in the United States. The Exchange remits 80% of the returns of the sales to each association, the remaining 20% being kept by the Exchange until the end of the season when, after deducting expenses and a small amount for a sinking fund, it is properly divided.

The manager and sales agent, A. U. Chaney, is hired from year to year at a salary of $12,000 and expenses. The Exchange did business amounting to $2,000,000 in 1912 and the product which is only cranberries, found markets in all portions of the United States.

Owing to the increase in business, it was found necessary to establish a sub-exchange at Chicago, which has advisory control over the Wisconsin Sales Co. The Wisconsin Sales Co. has handled over 85% of the cranberry crop of Wisconsin. Thirty thousand barrels of cranberries which returned to the fifty-odd growers an average of $6 per barrel, were marketed in 1911.

The individual growers deliver the product to the association warehouse where it is carefully graded and packed in barrels of uniform size, containing 100 qts. dry measure. Several inspectors are appointed to supervise the work in different sections of the state. The barrelled fruit is stored until the point of distribution is known, information regarding which is received from the Central Exchange. Car lots only are sent out and all business is on a strictly cash basis. No business is done with retailers, but the Association interferes in preventing retailers selling at exorbitant profits.

To facilitate tracing of irregularities in shipments, the following data is placed on the envelope that accompanies each car shipped:

Order No. ..... Car No .....
Order Date ..... Car Initial.....
Car Ordered Date..... Loading Date.....
Shipping Date..... Date Inspected.....
Shipped From.....
Shipped To .....
Destination .....
Route .....
Condition of Car ..... Kind of Car .....

Shipped By
Wisconsin Cranberry Sales Co.
Grand Rapids, Wisconsin.

Bbls. *Brand Cranberries* *Packer No.*

Temperature loading point.
(a) Storage
(b) Berries in storage
(c) Car
(d) Berries in car
(e) Outside air when loaded
(f) Dew point

Weather conditions at destination.
Temperature of air
Temperature of car
Temperature of berries
Number of berries to cup
Weather at destination
Weather at time of harvesting
Weather at time of packing
Weather at time of shipping
Condition on arrival
Remarks

In a limited way, the Company controls the price, but it has found by experience that if the price is too high and is kept too high, a large part of the crop will remain unsold at the close of the marketing season, and the gain through the higher price on the part sold is less than the loss at the close of the season on account of the unsold berries. If, on the other hand, the organization puts the price too low and keeps it low, the berries may all be consumed before the marketing season is half over and later purchases cannot be supplied.

or if supplied, only at exorbitant prices. The Association has made both of these mistakes in the past and the problem that presents itself at the opening of each marketing season is: What price (a gradually advancing one) will distribute the crop over the whole marketing season so as to leave none unsold and cause no marked scarcity of this fruit near the close of the marketing season? A mistake either way results in loss to the growers and an injustice to the public. The question has often been asked, "How can the Association ascertain the effect of price on the quantity of cranberries that will be consumed?" J. A. Gaynor, the manager, has been endeavoring to solve this question by getting the opinions of a large number of cranberry retailers in the state. The Association intends to make and keep a record and an estimate of everything that has an influence on the demand for cranberries and at the close of the season, they propose to review and reëstimate the elements that influence demand. They will again estimate a price, a gradually advancing one; that would, had it been used, have distributed the supply over the entire marketing season of that year. The Association does not believe in fixing the price so low that speculators will be induced to take shipments to hold. The berries should go as directly as possible from grower to consumer and at least possible expense so that the consumer will get cheaper berries and the grower better prices.

The Association has had but little trouble with railroad companies and demand a square deal in all transactions. It has reached a stage where dishonest brokers, commission men, and railroad companies can dictate but little. Through the united efforts of the Central Exchange at New York City and the Wisconsin Cranberry Sales Co., the following reductions in railroad rates have been secured on every car of 200 bushels.

$40 to California.
$72 to all northern Pacific points.
$60 to Winnipeg.
$12 to Minneapolis.
$24 to Milwaukee and Chicago.

This decided reduction has helped to open new territory for sale of Wisconsin cranberries.

An excellent feature of the Association is that different varieties and different priced berries can be shipped in the same car regardless of who raised them. Each barrel bears the number of the grower and as soon as a lot is loaded, the business of the grower ends. In this way small lots can be shipped at car-load rates and the jobbers get a variety in prices and quality to suit the trade.

SPARTA FRUIT GROWERS' ASSOCIATION.

The growers of small fruits in the vicinity of Sparta had for a long time been marketing their fruit at home or in the near-by towns. The increased production soon led to an over supply for the home trade and it was realized that outside markets were needed. Independent action could not accomplish much in this respect, and it became evident that coöperation would be the logical solution of the problem. Through the efforts of five or six of the leading growers of this section, the Sparta Fruit Growers' Association was organized in 1896, with headquarters at Sparta. This Association is one of the most typical and successful fruit growers' marketing organization in the state. Seventy-five farmers joined at the outset and 500 shares at $2.00 par value were sold. In 1909, there were 250 stockholders with $6,000 capital-stock, divided into 3000 shares. At present the Association has 285 members, all of whom own one or more shares.

As first organized, the Association had a rather crude constitution and by-laws. The members were given the privilege of selling fruit on the streets, and to any buyer who would make an offer. Besides, the grower could dictate as to what place his fruit should be shipped. The only restriction placed on the shipment was that in shipping to a city where the Association had an agent, the grower was to ship to the agent only. In 1906, a better constitution embodying better business principles was adopted. Since this change, shipments and yearly profits have been steadily increasing.

The receipts for four years beginning with 1906 were as follows:

1906	$32,000
1907	42,000
1908	55,000
1909	60,000

In four years, under the coöperative plan the receipts had been doubled and the price of berries had advanced 100% due to splendid methods of grading and distribution.

The total receipts for 1909, which was a banner year, were $58,940.00, with only $3,156 for running expenses. During this year the Association shipped:

29,164	crates	strawberries at $1.21	$35,391.90
1,819	"	blueberries at $1.36	3,122.99
3,389	"	red raspberries at $1.86	6,336.12
1,633	"	blask raspberries at $2.05	3,348.95
29	"	purple raspberries at $1.65	48.07
5,722	"	blackberries at $1.54	8,853.01
36	"	currants	49.57
4	"	huckle-berries at $1.21	4.88
37	"	plums at $.73	22.9[illegible]

51	" cabbages at $.77	39.40
78	" tomatoes at $.46	35.88
1,314	baskets tomatoes at $.11	140.31
47	" canteloupes at $.44	21.09
3,153	bu. apples at $.49	1,560.84

In 1911, the Association shipped sixteen carloads of ungraded apples from Monroe county. Low prices were received, but the manager states that with proper grading and sorting, these apples would have netted far greater returns. The value of fruit marketed in 1911 was $50,000, and the expense was $2,900.

The officers of the organization are president, vice president, manager, treasurer, and six directors, all of whom are leading growers of the section. All members are pledged to obey the Association rules and disobedience results in suspension. The "one man, one vote" rule is upheld and strict adherence to this is followed.

It is through the efforts of the energetic and competent business manager that this Association has been brought to its present high standard. He keeps in touch with the leading markets and by a little careful advertising is able to let the buyers know that orders will be promptly filled. He receives quotations from different cities, knows conditions as to supply and demand, and is thereby able to profit by any change that may occur in any market to which the Association is shipping. He sends daily quotations to regular customers, and is in touch with other associations as to probable shipment, destinations and daily price.

Each grower delivers the fruit to the manager and gets a receipt for same after it is properly graded and inspected. If a person delivers 30 to 40 cases, the grader takes out 5 or 6 cases at random and grades these on the quality of the fruit in each case. Strawberries are graded into Choice, Extra Choice, Fancy and are designated by B, A and X, respectively. The directors prescribe that each grower must stamp his number on the case. Each day's sales are treated as a unit and proceeds are distributed among the members according to the amount and quality of produce furnished. The Association has power to reject, at any time, all fruit in a bad condition.

A percentage of the receipts of all sales is withheld to meet the operating expenses and uncollected accounts. At the close of the season, any surplus money is paid to the members as pro rata dividend on their season's sales. The fruit is either sold on the open market, shipped out on standing orders to local dealers throughout the state or is consigned to reliable commission houses.

That the Association is operated on an economical basis is evinced by the fact that early in the season the number of acres of berries and probable yield is carefully estimated, and all fruit packages are ordered accordingly. It also furnishes other supplies to its members at a minimum cost.

The Association has had but little trouble with railroads and commission men, and the attitude of these agencies at present is a very important factor in the success of the organization. Good shipping facilities on both the Chicago and Northwestern and Chicago, Milwaukee and St. Paul railroads are offered.

The members of the Association feel that coöperative methods give them better distribution of products and a more equitable return than would be possible through independent action.

DOOR COUNTY FRUIT EXCHANGE.

That good fruit, especially apples and cherries, could be grown in Door county had been proved by farmers upwards of twenty-five years ago. Attention was first directed to the possibilities of Door county along commercial horticultural lines in 1892 when A. L. Hatch, a veteran fruit grower from Richland county and Prof. E. S. Goff of Madison visited the county for purposes of investigating the adaptability of soil and climate to the successful production of apples, cherries and small fruits. They were convinced that this was an ideal location for the growing of the above named fruits. Mr. Hatch planted extensively and induced other people to enter into fruit growing on a commercial scale.

It was found that conditions for cherry growing were especially favorable and during the last five years, extensive plantings of the cherry have been made. The soil is a warm, strong, clay loam, underlaid with limestone rock and has good air and water drainage. Favorable climate is the important factor in making it the successful cherry region that it is. In the spring, the cold winds from Lake Michigan retard development of the buds until all danger of frosts has passed. In the southern portion of the state this condition does not prevail, and the tender growth stimulated by warm weather, often succumbs to the late spring frosts. These favorable conditions for fruit culture induced many people to enter this business and soon the crops produced were greater than could be disposed of locally at remunerative prices. Individual selling in distant markets proved disastrous and it became evident that better means of marketing were necessary. In 1910, a number of energetic growers organized and incorporated the Door County Fruit Exchange with headquarters at Sturgeon Bay. That this was a wise move, has been evidenced by the rapid growth and marked success of the organization in handling fruit.

The Association has a president, vice president, secretary, treasurer and a board of nine directors, three of whom are elected each year for a term of three years. The directors for the most part are the leading fruit growers. The capital is $1,000, the par value being

$50 per share. The by-laws limit the number of shares that each grower may hold. Each member has one vote and this assures equality of voice in administration. The organization declares no dividends, making only sufficient charge for handling the fruit to meet the operating expenses and provide a small sinking fund. If losses are sustained in marketing any fruit, the entire amount of that particular fruit handled during the year, bears the loss pro rata, thus rendering the loss of any one grower small. The Association handles the fruit of its members only.

Cherries, strawberries, plums, apples, currants, gooseberries and raspberries are handled. The Early Richmond cherry is grown most extensively and a ready market is secured as this variety is used largely for culinary and canning purposes.

The Association sold the following amounts of fruit during the season of 1912.

Cherries, 17,663 cases	$27,487.36
Strawberries, 16,017 cases	17,989.03
Currants, 1,914 cases	1,491.90
Gooseberries, 672 cases	726.25
Raspberries, 68 cases	112.20
Plums, 1,000 baskets	250.00
Apples, 942 barrels	2,000.00

The total receipts were over $50,000.

The past year was the best in the history of the organization. The yield of cherries was about double that of the preceding year, considering the larger sized crates and boxes and brought the grower an average price of $1.55 per case, the best in the history of the Exchange. The Door County Fruit Exchange marketed more fruit in 1912 than any other exchange in the state and at better average prices, with less expense in marketing.

The fruit is packed by the grower, except the apples which are handled at the warehouse. The fruit is delivered to the warehouse or to the dock, as the manager may direct, and the grower receives a receipt for the number of cases delivered. Each day's sales are closed by themselves and payments are made on the prices received the day on which the fruit is delivered. No attempt has been made to grade fruit, but steps to this end, no doubt, will soon be taken. If a poor lot is received, the grower is docked accordingly. Each grower is obliged to have his number stamped on each case of fruit delivered. If a complaint, referring to this number, is entered by the buyer, the grower is docked whatever the Association is docked by the buyer.

Markets are secured by the manager by a liberal use of the telephone and the telegraph, although some buyers come to the Association and buy direct. Markets are found throughout Wisconsin and

Minnesota. The larger shipments go to Minneapolis, St. Paul, Milwaukee and Chicago. Little advertising has been done by the organization, but it has found no trouble in disposing of its products. The Association has experienced but little difficulty with railroads and commission men.

The members are satisfied that the exchange is securing better results for them than could be secured by individual selling. There has been some slight dissatisfacton which was largely due to minor differences and in no wise does it menace the success of the Exchange. The prospects for a successful continuation and increase in size of the organization are very bright.

BAYFIELD PENINSULA FRUIT SHIPPERS' ASSOCIATION.

Although fruit has been grown in home orchards in the Bayfield section for a long time, its commercial culture has developed only in recent years. Like Door county, this region is favorably located for the production of cherries, strawberries, apples and cane fruits. The late spring, induced by proximity to Lake Superior, retards bud development and hence there is but little danger of late spring frosts. As more growers entered the fruit industry, more fruit was put upon the home market than could be consumed. This led to low prices, and to general discouragement among the growers. It became evident that outside markets must be found and this could be affected only through a fruit association. This led to the organization of the Bayfield Fruit Shippers' Association in 1910 at Bayfield. The capital was 4,000, but this was increased to $10,000 at the annual meeting in 1912. The par value of stock is $1 per share. $5,000 worth of stock has been sold up to the present time.

Mr. Kern, the manager of the Association, gives the following statement regarding the early history of the organization. "I found 66 men banded together by articles of coöperation at Bayfield, known as the Bayfield Fruit Shippers' Association with a working capital of $203.00 with which to pay office rent, salary of manager, to buy books, stationery, office furniture and pay other incidental expenses. Regardless of this I went into the work with heart and soul although at a great disadvantage for a considerable time." Much credit is due Mr. Kern for the efficient manner in which he brought the Association from a weak organization to what is now one of the best organized, best equipped, and most prosperous in Wisconsin.

The first crop shipped by the Association was in 1910. In 1911, 12,532 cases of strawberries at $1.51 per case were marketed. The members paid 10% of the receipts to the Association, which stimulated a feeling of prosperity and financial success.

The Association had a most prosperous season in 1912, handling:

26,974	cases strawberries	$30,000.00
510	" raspberries	775.00
233	" black raspberries	340.00
635	" blackberries	540.00
464	" cherries	685.00
110	" gooseberries	130.00
920	" currants	785.00
113	" plums	105.00
2,315	" blueberries	3,616.00
74	crates green tomatoes	35.00
84	" ripe tomatoes	48.00
32	baskets cauliflower	32.00
104	boxes string beans	41.00
1,510	" (stand bu.) apples	1,330.00
	Potatoes	7,000.00

The manager holds office for the entire year and thus is better able to attend to the minor details of the working machinery which would be overlooked if a part-time manager were appointed. The Association has a president, vice president, secretary and treasurer. Nine directors are chosen for a term of three years, three being elected at each annual meeting.

In addition to handling apples, strawberries, cherries and small fruits, the Association handles all kinds of produce, including grain, hay, feed, seeds and potatoes. Strawberries have been most profitable, but tree fruits, especially cherries, will soon hold a prominent place in the shipments.

The growers deliver the fruit to the Association warehouse or car. Here it is graded by a competent inspector who issues a receipt showing the amount and grade. No label is used except the association stamp bearing the grower's number. Packing is supervised by the grower or some one whom he designates. Each grower is obliged to have his name or number stenciled, printed or marked on each shipping package delivered to the Association. Each day's sales are treated as an entirety and are prorated according to grade. The fruit or produce of any member may be rejected at any time if found to be in an unmarketable condition, or packed with an intent to defraud.

The Association has endeavored to establish a retail trade, but up to the present time this has been only by correspondence. The manager calls on the wholesale trade after the crop is assured, and arranges with different houses to handle as much of the product as their trade requires. The plan is to sell outright as much as possible. There is some conflict between the retail trade and the wholesale dealers' market. This the Association tries to guard against as much as possible, but caters to the retail trade as better prices are forthcoming from this source. The Association sells for non-members, charging a commission, but does not buy fruit outright either from members or non-members.

The only advertising done by the Association is with stationery and with the quality of fruit put on the market. The "B" grades have been, up to this time, loaded in cars and consigned to commission men, who give returns based on the grade delivered. The organization has been rather well satisfied with this method, but during the coming season will be more rigid and will make a wider difference in the value of grades.

The Association has fairly good freight service to St. Paul, Minneapolis and Duluth, to which points most of the fruit is shipped. Serious trouble has occasionally resulted on connecting lines, due to delay at terminals. The Omaha railroad and American Express furnish transportation facilities, but the Association has arranged with the Western Express Co. for boat service to Ashland which will greatly increase shipping facilities.

ALMA CENTER FRUIT GROWERS' ASSOCIATION.

Previous to the organization of this Association, there were not more than four or five commercial growers of strawberries in the vicinity of Alma Center. One of these had been growing truck crops and berries for the local markets for a number of years. Others entered the business, and it was soon realized that all would lose money unless markets were extended. Coöperation seemed, to all except the one original grower, who because of narrowness of mind, insisted that the whole business belonged to himself, to be the only solution.

The Association was incorporated under the laws of Wisconsin in the spring of 1910 with a capitalization of $500, comprised of 250 shares at $2 each. The Association at present has 91 members holding 216 shares of stock. Included in this number is the obstinate member who was given the privilege of selling as many berries as he could in his own name. In making this agreement, the Association made a mistake. It has now the difficult task of changing its by-laws and compelling all members to be loyal to the Association.

When the Association first started, it was recommended that it join with Merrillan, four miles away, since that point was a railroad junction and could furnish better shipping facilities. Organizations, however, were started at each place and experience is proving the wisdom of such action. The two associations are on the most friendly terms and work together. The Alma Center Association has the advantage of better territory west of it, and the good resulting from it reaches a larger number. In addition, it is a benefit to the village and territory surrounding it.

Mr. G. M. Breakey, manager of the Association, believes in a larger number of local organizations with a large central selling exchange to govern the locals, prevent glutting and assist in distribution. Mr.

Breakey further contends that methods of distribution in the United States are deplorable and will not be much better so long as express and railroad companies continue to dictate. The following is an example of their unjust discrimination which the Alma Center Association has to meet.

The rate on refrigerator cars from Alma Center to Duluth is $88.00 while the rate from Merrillan Junction, only four miles distant, is $56.00. The rate from Alma Center to Merrillan is $9.00; hence the Association is compelled to bill a car twice and besides, the manager must be present to do the rebilling. Express companies will not furnish a refrigerator car to ship off this line, but advise the Association to consign to the commission house at St. Paul which can obtain service to any point on or off the line. Under existing conditions, the organization has had best results in consigning car lots to one reliable commission firm and in keeping them informed regarding all shipments.

The following is the amount of fruit marketed and price received since the organization was perfected:

1910, 2,000 cases strawberries at $1.15 net.

1911, 8,347 cases of strawberries at $1.00 net.

1912, 5,442 cases of strawberries at $.97½ net.

The first year's operating expense was 7% of receipts, while that of the last two years was 5%. Net receipts, less percentage for operating expenses, are prorated to growers.

The grower delivers his berries to the car and receives a receipt showing number of cases and grade. Whenever the pay for all sales in any lot is received, the total net amount less 5% for expenses is prorated to the grower's account. Each grower may, according to the by-laws draw out his full amount less 10%, which is held back for emergencies, until the end of the season, when all expenses are figured and charged to growers. The balance is paid to him at time of final settlement of accounts. The by-laws provide for three grades of berries which are X, A and B and in prorating, a difference of 25 cents per grade is made. A certain standard for "A" grade for each lot is determined by the inspector. Mr. C. may deliver 30 cases averaging a little better, in which case the inspector will allow him enough "X" grade to equalize the difference. Mr. E. may have 20 cases averaging under "A" grade. His receipt will show enough "B" grade to equalize. If there is any fruit offered which the inspector considers unfit for shipment, it is consigned totally as a special lot and the grower accepts actual returns less expenses.

The association has not used labels on their cases, but use a stamp, giving name and address of the Association as well as the grower's number which greatly facilitates the tracing of irregularities. The

organization furnishes crates to the members at net cost. Although not very old, this Association has been instrumental in securing reasonable profit to growers, increased business for local merchants and better distribution of products.

BAYFIELD COUNTY FARMERS' AND FRUIT GROWERS' ASSOCIATION.

The Bayfield County Farmers' and Fruit Growers' Association was organized at Washburn, March 9, 1912, with a capitalization of $10,000. Stock is sold at $1 par value and purchases are limited to $100. No business was done during 1912 with the exception of building a warehouse at a cost of $500. In addition to handling the fruit crop, the Association will handle all kinds of farm produce as well as flour, feed, seed grains and farm machinery.

Mr. Morgan, the manager, states that the Association expects to buy outright from the stockholders but will sell on commission for others, charging a light rental above the cost of handling. Growers will receive their pay when the Association receives remittances for the goods sold. Rebates will be determined at the end of the year after paying a dividend of 6% on the stock. All expenses of operation will be deducted and if there is any money left, it will be divided pro rata among the stockholders who have purchased goods from the Association during the year, in proportion to the amount of business that each contributes. The Association expects to assist the growers greatly in effecting better means of fruit distribution and to instill a general spirit of coöperation among its members.

MERRILLAN FRUIT GROWERS' ASSOCIATION.

The growers of Merrillan faced to a large extent, the same problems of transportation, distribution and economical handling of fruits which confronted the Alma Center growers. To better meet these conditions, the Merrillan Fruit Growers' Association was organized in 1910.

Strawberries comprise the bulk of the fruit handled by the Association. All berries are delivered by the growers, to the Association warehouse where each package is stamped with the Association stamp and also the number of the grower. In this way poor quality stock can be traced to the grower who brought it in. This method is an incentive to good packing. A small amount is retained from the growers' receipts, to constitute a sinking fund.

Markets are secured by letters, telegraphs, telephone and personal visits by the manager. Best results were obtained when this work was carried on throughout the year. Car lots go mostly to the larger cities in Wisconsin and Minnesota. Advertising is done by distributing cards and letters to dealers before the season opens.

The manager holds office for the entire year, attends to the collecting and shipping of fruit, secures markets, and fulfills any other duties that the board of directors may require. The Association has suffered but little trouble with commission men and railroads.

The organization is in good standing with the merchants but not entirely so with a few citizens, who, previous to the establishment of the Association, could buy berries on the street for 50 cents per case. No grower now peddles berries and the citizens are compelled to pay the market price. The Association buys crates in car lots for members and saves them a considerable amount each year. This organization, though young, has accomplished much towards the solution of the marketing problem in this section.

The Coöperative Fruit Associations of Wisconsin have done a great deal to promote the welfare of the fruit industry of this state, but there are a variety of ways in which they may bring about greater results in the future than they have in the past. They may prove effective in this respect by stimulating a judicious advertising of the fruits of each section. In the clothes industry the manufacturers regulate the styles and popularize them by skillful advertising. This can be done equally as well by fruit associations. Hood River apples, for instance, sell for twenty-five cents each, not because of their superior quality, but because of organized advertising which has educated a certain class of consumers to demand such apples at any price. Such advertising has been supplemented by proper growing, packing, and all the details of careful marketing. The same fruit, without advertising, would never have made land in the Hood River Valley worth hundreds of dollars per acre. Hood River Valley has turned the balance in its favor by making Hood River apples popular. Fruit eating must be popularized. Make the eating of fruit as popular as breakfast foods, pork and beans. This problem is not to be solved by one man, but by the united action of fruit associations. Advertise your fruit.

The fruit associations can further bring their influence to bear in the establishment of a Central Exchange or a State Coöperative Bureau in connection with the College of Agriculture. Such a bureau could examine local difficulties in the methods of marketing, help find markets, report condition of crops and fruit and crop movement from producing points to leading markets keep a list of reliable commission men dealing in fruits and other farm products, and formulate an estimate of the supply of fruits and vegetables in the principal markets.

The Association should also strive to establish a few standard varieties of fruit in each section and establish a reputation of that section for a particular variety. Why cannot the Wisconsin Fruit Associations follow the examples of Community Live Stock Breeders' Associations

which have done so much to further the interest of their industry by developing certain definite breeds for certain sections? Up-to-date methods of culture and spraying should be stimulated by the associations. Further, they should encourage the passage of a law to compel farmers to spray the neglected home orchards against insect pests and fungous diseases. The use of fancy corrugated paper boxes should also be stimulated. Apples could be shipped for a considerable distance in these packages and would bring fancy prices at the large restaurants and hotels.

The Association may also serve as an agency for creating a more perfect social and business relationship between the inhabitants of the neighborhood in which it exists. It can justly be conceded that success has at last crowned the efforts of the hundreds of growers who have entered into the true spirit of coöperation. The most conservative will advocate a continuance of the coöperative movement which has accomplished, in its various applications, so much for both producer and consumer.

VARIETAL DISEASE RESISTANCE OF THE PEAR AND APPLE.

BY ANDREW NELSON PORTMAN.

A Thesis Submitted for the Degree of Bachelor of Science in Agriculture, University of Wisconsin, 1912.

INTRODUCTION.

This work was taken up at the suggestion of Prof. L. R. Jones, due to the fact that no attempt had yet been made toward a collection of such information as is embodied here. The available information is the result of work and observation by many, and is scattered all through horticultural literature in a decidedly fragmentary form.

The importance of a collection of information of this sort is that it provides for all interested in practical horticulture a source of ready reference and obviates the necessity of an extended search. It should enable planters and nurserymen to avoid setting out varieties susceptible to diseases prevalent in their community, and call the attention of the established orchardist to the degree of susceptibility, thus enabling him to determine the care and attention necessary for whatever varieties he may be interested in.

The knowledge here embodied has been obtained from experiments and field observations recorded in the bulletins of the various stations, and in a small measure from growers' personal experience. The source of information has in each case been carefully cited.

There are several causes for difference in susceptibility, among them being variations in climate and soil, different methods of culture, the location and exposure of the orchard, and the presence of wild fungous hosts. Some varieties have inherited a resistance or protective quality developed as a result of the struggle for existence with the invading parasite.

FIRE BLIGHT.

Description.

This disease also known as pear blight, twig blight, blossom blight, and other similar names has been known in the United States for more than a century. It was first known in the eastern states, and by reason of its being there longest established is worse in that section, although the disease has long been bad in the middle West. In Illinois a severe attack occurred about 1880–90. In the far West and Southwest it has since become an important bacterial disease, and is certainly distributed throughout the United States at present. So far as is known it does not occur in Europe or Asia.

The disease is made noticeably by the wilting and blackening of blossoms and tips, and the subsequent blackening and shrinking of the older twigs and branches as the disease progresses. In some cases the bark is broken and a gummy exudate is given forth, which varies in color from milky white to brown or black.

This disease known to even the earliest horticulturists of the eastern states has been attributed to several causes, such as insect attack, climatic and soil influences, and atmospheric disturbances. It was not until 1888 that Professor Burill of Illinois, discovered that fire blight was due to an organism known as *Bacillus amylovorus*, thus disclosing the true cause.

This disease attacks the pear worse than the apple, and the more rapidly growing varieties of either fruit suffer the worst. The application of much nitrogenous fertilizers which tends to force excessive wood growth should be avoided, as this renders the tree more liable to blight. Winter pruning also tends to induce wood growth and so is sometimes omitted.

A tree that stands in well cultivated land is more susceptible than one that is growing in sod or untilled land. Good tillage is usually necessary for growth, especially with the pear, but the vigor necessary for the proper development of fruit also makes the tree more susceptible to blight. The lack of tillage makes for short growth and small fruit, but makes the tree better able to withstand the blight.

Control measures consist in pruning out all areas where the blight may winter over. If this is done thoroughly no opportunity is afforded for infection the following season. It is very important to observe antiseptic precautions in the cutting out of infected areas.

The above facts apply to both the pear and apple, and to the other hosts of this disease, the quince, wild crabs and hawthorn, and less frequently the plum.

RELATIVE RESISTANCE OF VARIETIES TO FIRE BLIGHT.

Resistance of the Apple.

As has been stated this disease has long been known to horticulturists, and differences in varietal resistance were probably noticed, but it was not until comparatively recently that the real cause was discovered. Consequently reliable observations regarding this difference in resistance have all been made since that time.

Wisconsin. One of the most recent attempts to gather information of that sort was made in the spring of 1911 when H. D. White, in connection with his senior thesis at the University of Wisconsin, sent out letters to twenty-five growers throughout the state. Of the questions asked in these letters the one pertinent to this discussion was, "What varieties of apples are most susceptible to fire blight?" Out of the twenty replies received to this question twelve stated that the Yellow Transparent was the most susceptible to blight, while the remaining eight named the Wealthy. A. L. Hatch of Sturgeon Bay claimed that the Alexander was so badly attacked that he was forced to give it up, and also mentioned Switzer and Yellow Transparent as very susceptible.

The name of the grower, his locality, and the varieties named as susceptible in that district are given in the following tabulation based on the replies received by Mr. White:

Name and address of growers.	Yellow Transparent.	Wealthy.	McMahon.	Duchess.	Northwestern Greening.	Alexander.	Windsor.	Fameuse.	Longfield.	Lowell.	Red Astrarchen.	Twenty Ounce.	Sutton's Beauty.	Russet.	Tolman Sweet.
A. D. Barnes, Waupaca						+									
A. K. Bassett, Baraboo	+														
P. T. Gillette, Antigo..		+													
T. H. Harris, Medford..	+			+											
A. L. Hatch, Sturgeon Bay			+				+						+		
John Howie, Waunakee				+		+	+							+	
H. Kaufman, Marshfield	+	+			+										
G. J. Kellog, Lake Mills	+				+										
M. S. Kellog, Janesville	+														
A. N. Kelly, Mineral Pt.		+						+							
T. E. Loope, Eureka...		+							+						
H. C. Melcher, Oconomowoc	+		+												
L. E. Montgomery, Reedsburg		+													
W. J. Moyle, Union Grove	+									+	+	+			
F. Muhlkamp, Sparta.,	+														
J. S. Palmer, Baraboo..	+	+	+												
L. H. Palmer, Baraboo.															+
John Reis, Ithaca.....	+														
Jas. Riley, Bloom City.		+													
E. G. Tulledge, Oakfield	+		+												

The writer conferred with Mr. Frederic Cranefield, secretary of the Wisconsin Horticultural Society, regarding the above list, and it was his opinion that the Northwestern Greening was somewhat more susceptible than indicated, and also considered the McMahon susceptible especially to twig blight. Mr. Cranefield stated that the Duchess was rarely or never attacked, the Russet was comparatively free, and the Hibernal was absolutely resistant.

Mr. Cranefield's opinion regarding the following varieties was: Yellow Transparent, Windsor, Switzer, and Transcendent Crab are especially susceptible; the Patten Greening is moderately susceptible; and the Wolf River is resistant. Among the oldest trees in Wisconsin, some of them fifty or sixty years old, are found the Plum Cider, Tolman Sweet, Golden Russet, and Fameuse, thus showing that these varieties are especially resistant. These varieties then are listed accordingly by Mr. Cranefield as follows:

Susceptible.	Resistant.
Yellow Transparent	Wolf River
Windsor	Plum Cider
Switzer	Tolman Sweet
Transcendent	Golden Russet
McMahon	Fameuse
Mod. Susceptible.	Hibernal
Patten Greening	Duchess
Northwestern Greening	

General. According to Waite (1905:137), apples have suffered less damage in the older sections of New York, New England, and Michigan, but Spitzenberg, Newton Pippin, and Ben Davis have been very badly blighted. With the Russian varieties such as Yellow Transparent, Alexander and Red Astrachan the disease has even entirely killed the young trees.

By other observers, (Stevens and Hall, 1910:80) the Ben Davis is mentioned as almost entirely resistant, the Celestia, Buckingham, Mammoth Black Twig, White Winter Pearmain, and Winesap as resistant, while they consider the Lowell, Isham, Smith Cider, and Yellow Transparent especially susceptible. In general they consider the crab varieties more susceptible than others.

In his report to the Canadian Fruit Growers' Association in 1910, D. H. Jones said: "The Russian varieties have much more canker (due to blight) than the Russets." Large cankers exhibited by Jones at that time were on Russian varieties. "We have the Roman Stem and other varieties, but all cankers exhibited starting in the body and on the larger limbs were on the Russian varieties."

According to Duggar (1909:123) there is little difference in resistance among varieties of apple, nearly all the standard varieties being more or less affected.

A letter from M. B. Waite, the orchard disease expert of the United States Bureau of Plant Industry, (March, 1912) says: "The Newton Pippin is not proving to be a very susceptible variety in the Appalachian Mountain orchards—in fact we have come to consider it as one of the more resistant sorts. The Winesap which is extensively grown in Virginia varies enormously—some years it has been remarkably susceptible, particularly to blossom blight, while other years it has been comparatively uninjured. York Imperial, a leading variety, and Missouri Pippin, occasionally grown, have suffered extensively. The Grimes Golden is a particularly susceptible variety in the Eastern States. Yellow Transparent, White Astrachen, Alexander, and certain other Russians are very susceptible. The Red Astrachen and Duchess are only moderately so."

In connection with this work the writer sent out a letter in March, 1912, to fifteen growers in various parts of Wisconsin. From ten replies received the varieties, regarding which information was sought, have been listed as found below. This list agrees, with but a slight variation, the Tolman Sweet, with the opinion of Mr. Cranefield, whose observations are based on large experience.

Susceptible.	Mod. Susceptible.	Resistant.
McMahon	Wealthy	Duchess
Windsor Chief	Fameuse	McIntosh
Patten's Greening	Tetofsky	Plum Cider
Yellow Transparent	Ben Davis	Wolf River
Pewaukee	Longfield	
	Tolman Sweet	

From the foregoing observations it seems to be agreed that the crab varieties, with the exception of the Hibernal are more susceptible than the standard apple. Of the latter sort it seems generally agreed that the Alexander, Yellow Transparent, Wealthy, and McMahon are among the most susceptible varieties, while the Plum Cider, Golden Russet, Fameuse, and Duchess are held to be the most resistant.

RESISTANCE OF PEARS.

A large part of the commercial varieties of pear are quite susceptible to blight. Those varieties affected seriously are more uniformly susceptible than is the case with the apple, that is, a variety susceptible in one region is about equally so in another. The fact of their degree of resistance is quite definitely established, different observers agreeing as to that question as is shown in this discussion.

In the above mentioned letter, M. B. Waite says regarding pears, that the LeConte is one of the more susceptible of the Oriental hybrids. "It is not, however, nearly as susceptible as are the commoner varieties of the Pyrus communis group, such as the Bartlett, Manning's Eliza-

beth, Clapp's Favorite, Anjon, Lawrence, Comice, Bosc, etc. The average of the Oriental hybrids is much better as to resistance, the Kieffer being so resistant that its culture is a great deal easier even in the Gulf Coast States than any other prominent commercial variety."

Waite also has stated (1905: 137) that in states south of New Jersey and Delaware the Bartlett is abandoned, except in a few mountain localities. The Orientals are extensively grown in these localities but have sometimes suffered severely. The LeConte, an early pear in the southern states after very extensive planting, was almost wiped out.

It is possible to top-work the Bartlett on Winter Nelis, Kieffer, LeConte and other resistant varieties. It is usual in such practice for the Bartlett stock to blight to the graft and then stop.

Five authorities consulted, alike declared the Duchess, Anjon, Angouleme, Kieffer and Seckel are the more resistant varieties, and named the Bartlett, Clapp's Favorite and Flemish Beauty as susceptible varieties.

There is a decided agreement as to the resistance of pear varieties to fire blight. The Bartlett, the best known and most demanded of the commercial varieties, is agreed upon as the most susceptible. The Kieffer, a newer oriental variety producing a choice fruit is generally considered quite resistant.

SCAB.

Description.

The scab on apple and pear is widely distributed in the United States and occurs in all countries where these fruits are commercially grown. Regions with cool, moist weather either in spring or summer are liable to be troubled with it; hot winds suppress the disease.

The fungi causing the scab of apple and that of pear are very closely related, although generally referred to as two distinct species. The apple scab organism is known as *Venturia Pomi*, and that connected with the pear scab as *Venturia Pyrina*.

The casual fungus occurs on the fruit and leaves, also on leaf stalks, flowers and twigs. In bad epidemics considerable curling of the leaves may result. Upon the fruit circular green spots are produced, the epidermis being killed as the fungus spreads and the dark, scabby spots are later produced.

For control of scab at least one spraying should be given before blossoming. Differences in treatment arise according to differences in climate, but the general method is much the same. A second spraying should be given immediately after the petals fall, and at least one more two weeks after the second. Conditions, however, must determine the length of time intervening and the number of applications.

RELATIVE RESISTANCE OF VARIETIES TO SCAB.

Resistance of the Apple.

Regarding scab on the apple Duggar says (1909:267), "There are probably no varieties of (pear or) apple which are entirely free from scab. Nevertheless there is a great difference in susceptibility. The susceptibility of different varieties of apple to the scab seems to vary considerably according to the region in which grown, yet nearly all of the standard varieties may be affected during seasons favorable to the fungus."

R. A. Emerson (1905:9) of Nebraska states that from the behavior of young trees in the experiment station orchards, Oldenburg, Whitney, Wealthy, Salome, and Patten Greening might be said to be almost perfectly free from scab. Red Astrachen, Windsor, Jonathan, Ingram, York Imperial, Ben Davis, Gano, Northwestern, Missouri Pippin, Iowa Blush, and Grimes Golden might be called fairly resistant, while Winesap, Mammoth, Black Twig, Sheriff, Ralls Genet, Virginia Beauty, Red June and Northern Spy would be regarded as very susceptible to scab.

Stevens and Hall (1910:74) say that the Snow, Spitzenberg, Maiden Blush and Twenty Ounce are more susceptible than the Baldwin, and put Golden Russet and Hubbardston among the most resistant varieties.

In investigating the relation of color to scab resistance Erikkson (1911:129) said his experience in Southern Sweden led him to conclude that red apples are more susceptible. All varieties of Winterkalvill and the Rosenhager are very susceptible. Red and White Kalvill are also susceptible to scab on leaf (Stockholm 1884), the Red Winterkalvill suffering worst among thirty varieties near Malmo, Sweden. Therefore the red pigment is of no value in resisting disease.

Wisconsin grown apples may be classified about as follows according to replies received from growers to the author's letter mentioned previously under Fire Blight on the Apple. Susceptible varieties are Fameuse and Pewaukee, those moderately susceptible are Wealthy, McMahon, McIntosh, Plum Cider, Windsor, Chief, Wolf River, Ben Davis, Patten's Greening, Longfield, and Tolman Sweet; the resistant varieties are Duchess, Tetofsky and Yellow Transparent.

RESISTANCE OF THE PEAR.

Some varieties as will be seen, are more resistant than others, but apparently none of the commercially grown varieties are entirely free from scab.

In New York (Duggar, 1898:619) it is generally reported that LeConte, Kieffer, and Bartlett are less attacked than such varieties as

Anjon, Lawrence, Duchess, Clairgeau, Sheldon, Seckel, Summer, Doyenne, Flemish Beauty and Jones.

Waite makes a general list (1900:388); "thick-skinned and therefore more resistant" varieties are Angouleme, Kieffer, Lawrence, Clairgeau, Howell, LeConte, while the more susceptible varieties are Flemish Beauty, Seckel, and White Doyenne.

In Michigan the Flemish Beauty, Seckel, and Summer Doyenne are especially subject to this disease.

APPLE RUST.

Description.

The fungus, *Gymnosporangium macropus*, causing this disease produces the cedar apples and occurs practically throughout the range of the red cedar and its other hosts.

If the infection is severe, injury is sometimes done to the leaves, but it affects the fruit most seriously. The fungus is more common in humid regions, being noticeably abundant in the apple growing regions of the eastern Appalachians and in the South.

The disease first evidences itself as yellow spots on the upper surface of the leaves, that soon turn black. After some weeks a spore-bearing cushion is formed on the under surface of the infected spot, from which small tubes project. These tubes soon split and curl back on the leaf. The fungous spores from the apple leaves are scattered by the wind, those falling upon red cedar trees developing. Similarly the spores are liberated from the cedar trees in the spring, and only those develop that fall upon the apple.

No entirely satisfactory spray control has yet been discovered. Lime-sulphur is fairly valuable; Bordeaux is better, but far from successful. The date of the application is of more importance than the character and strength of the spray.

The most satisfactory method is to remove the red cedar trees in the vicinity of the orchards, and in vicinities where it is impossible to exterminate the red cedar the planting of susceptible varieties should be avoided.

RELATIVE RESISTANCE OF VARIETIES TO RUST.

RESISTANCE OF THE APPLE.

Duggar (1910:425) says that apples differ greatly in their degree of susceptibility. In the far West, crosses between the wild crab apple and the cultivated species have given some forms peculiarly susceptible.

Gidding's article (1911) says: "Some apples are more resistant to disease rust than others, and the degree of resistance which any variety

shows seems to vary quite widely in different sections of the country." He mentions Grimes Golden as practically immune in West Virginia, while Ben Davis, York Imperial, Smokehouse, and Rome Beauty suffer about in the order named. Varieties especially resistant in other states are McIntosh, Yellow Transparent, Gravenstein, Red Astrachen, Grimes Golden, Winesap, Sweet June, and Maiden Blush. He further records the fact that some western states report York Imperial and Ben Davis as resistant, but they are quite susceptible in West Virginia. There the York Imperial foliage is severely infected, the fruit but slightly; Ben Davis showed much worse infection on fruit.

Stevens and Hall (1910:80) name as resistant varieties: Duchess, Sweet June, Yellow Transparent, Red Astrachan, Ben Davis, Maiden Blush, Winesap, Oldenburg, Gano, York Imperial. Those more susceptible are: Wealthy, Red June, Whitney, Jonathan, Missouri Pippin, Prairie Crab.

In New York (Stewart, 1910:316) in 1909 and 1910 Wealthy and Jonathan were reported as affected. Baldwin, in 1902-4 was entirely free, while adjacent Russet and Ben Davis were infected. Ben Davis and Rome were particularly bad in 1909. A four-year-old orchard in 1909 showed the following: Wealthy, Boiken and Rome were very rusty; Hubbardston and Sutton were slightly affected; while McIntosh, Yellow Transparent, Gravenstein, Red Astrachan, and Oldenburg were nearly or quite free from rust. * * * *

Mr. Kellogg of Lake Mills, Wisconsin, (August 1911) reports Wealthy as susceptible to rust, Sweet Wine and Jonathan moderately so, and considers the following resistant: Tolman Sweet, Hubbardston, Nonesuch, Shield's Crab, Hyslop, German, Gideon, Wolf River, Northwestern Greening, Longfield, Plum Cider, Hamilton, William's Favorite, Bailey's Sweet, Virginia Crab, Pewaukee, Hyde's King, Gem City, Yellow Transparent.

From the above observations there seems to be the greatest agreement on the two varieties, Jonathan and Wealthy as susceptible. Those varieties most widely mentioned as especially resistant are: Yellow Transparent, Red Astrachan, Maiden's Blush and McIntosh.

BORDEAUX INJURY.

Regarding Bordeaux injury to apples Hedrick (1907:142) says: "The damage is severe some seasons and in others scarcely occurs at all; in some localities in a certain season and not in others; in some orchards and not in others treated the same; it occurs in dry or wet seasons; and parts of the tree may be uninjured. There is a difference in individual susceptibility; some seasons it is more severe on the fruit, others on the foliage. A variety with immune fruit may have susceptible foliage. The most thrifty, best-kept orchards in which

foliage is abundant and healthy seem most susceptible to Bordeaux injury."

BITTER PIT OF APPLE.

The following on the bitter pit of apple was prepared by Evans (1909:9) of South Africa: "It is practically impossible to make an accurate statement regarding the relative immunity or otherwise of the many varieties of apples now grown in South Africa, for it is of no uncommon occurrence to find that varieties which are clean one season become badly spotted the next."

BITTER ROT.

Duggar (1909:274) says of bitter rot that it is unquestionably the most destructive apple disease of the chief growing districts of the United States. "In some sections it is reported more commonly upon Ben Davis and Grimes Golden, but this may be more particularly due to the fact that these varieties were more generally grown in the regions for which the report was made. The fungus is, in fact, notably unrestricted as to host."

Longyear (1904:10) says that bitter rot is very destructive in some of the more southern states, being especially bad in southern Illinois, where it is the chief apple rot. It is uncommon in Michigan, but has been found on Pennock's Red (stored) and on packed Greenings. Ben Davis and Grimes Golden are recorded as the varieties most subject to this disease in Illinois. * * * *

FRUIT SPOT OF APPLE.

(*Cylindrosporium Pomi*).

Duggar (1909:341) says of this disease: "The Baldwin is especially susceptible but nearly every New England variety is more or less affected. In New York the Spitzenberg and Twenty Ounce are mentioned as the most susceptible varieties of apple to the limb canker, while Baldwin, Wagener, Greening, and King follow in the order given; the Tolman Sweet was reported practically resistant."

PEAR LEAF-BLIGHT.

(*Entomosporium Macalatum*).

According to Waite (1900:388) the Oriental varieties are particularly resistant to pear leaf-blight, especially the Kieffer; in the Gulf States, however, the Le Conte often becomes defoliated by it. Of the European varieties, the Lawrence seems to be especially free from it in Mary-

land and Virginia. Bartlett, Howell, and the ordinary European varieties suffer with it severely. The Duchess is also mentioned by Duggar as one of the most resistant varieties.

SOOTY BLOTCH AND FLY SPECK OF THE APPLE AND OTHER PLANTS.

This disease is caused by the fungus known as *Leptothyrium Pomi.* The organism is most abundant under conditions of considerable moisture, half shade, and abundant dust. The resulting discolorations affect the market value of infected fruit. Disfigurations are only superficial, being large and irregular in outline or small, dark circular specks.

In Michigan the varieties most affected are Greening, Northern Spy, and Baldwin (Longyear, 1904:14).

Selby (1900:13) in Ohio reports Peck's Pleasant, Rhode Island Greening, Rome Beauty as affected by this fungus. In the same state, Gloyör (1911:146) reports as follows: "Apple blotch was found on Baldwin, Ben Davis, Stark, Pippin, Smith Cider, and Rome Beauty in several counties of Ohio. In one orchard 90% of the fruit was blotched, a not uncommon condition with many of the varieties named. The disease was on sprayed and unsprayed fruit, and was claimed to be due to lack of proper pruning, permitting successive crops of spores to be produced on foliage and fruit not reached by spray."

Sturgis (1897:175) reports that in Connecticut the disease occurs principally on Rhode Island Greenings, and that it was found on Newton Pippins in Pennsylvania. Professor Lamson of New Hampshire found it common on Greenings, Northern Spies, and Baldwins.

APPLE BLOTCH.

This disease should not be confounded with the sooty blotch just mentioned as it is attributed to a different fungus, *Phyllosticta solitaria.* It is one of the serious apple diseases of the South, and is more common upon the light colored varieties of the fruit.

Scott (1909:12) has listed the varieties of that region according to their resistance to the apple blotch as follows:

Badly affected: Northwestern Greening, Missouri, Ben Davis, Limbertwig, Red Astrachan, Smith, Maiden Blush, Lawver, Shockley, Willow, Arkansas Black, Gano.

Moderately affected: Oldenberg, Benoni, Arkansas, Bradford, Ingram, Collins, Winkler, Rambo, Golden Russet.

Slightly or not affected: Grimes, Winesap, Jonathan, York Imperial, and Red Reese.

In addition to the above the writer has observed the blotch in various sections on the following varieties: Sherman, Shannon, Arkansas

Pippin, Bough, Baldwin, White Permain, Yellow Newton, Smokehouse, Northern Spy.

NATURE AND CAUSES OF RESISTANCE.

As has been previously stated, in the introduction, the nature and cause of disease resistance varies in different cases. The causes enumerated before were climate, soil variations, cultural methods, location, presence of wild fungous hosts, and the fact was also stated that some varieties inherit a resistance or protective quality.

In the opinion of Waite, as was stated, (1900:388) the thickness of the skin of certain varieties of pear enabled them to better resist the attack of the scab fungus.

According to W. J. Morse, of the Maine experiment station, the fruit spot (C-pomi) is observed most frequently on the Yellow Bellflower and on native green and yellowish seedlings. The writer's experience, although very limited, includes similar observations, the Baldwin being the only variety with any deep coloring that has been noticed as affected with this disease. This raises the question as to whether or not the red coloring matter acts as a protection against the attacks of this disease.

Clinton has observed in Connecticut that fruit of resistant varieties of apple when attacked by rust produces only the imperfect stage, thus indicating that the disease resisting quality is internal and not merely external or due to a difference in skin.

Erikkson (under apple scab) has stated that his observations lead him to conclude that red apples are most subject to scab. The following tabulation was prepared from those varieties mentioned under resistance to apple scab:

Susceptible.	Mod. Susceptible.	Resistant.
Snow (R)	Baldwin (R)	Golden Russet (Y)
Spitzenburg (R)	Red Astrachen (Light R)	Hubbardston (Y-R)
Maiden Blush (Y)	Windsor (R)	Oldenburg (Y-R)
Twenty Ounce (Y-R)	Jonathan (R)	Whitney (Y-R)
Winesap (R)	Ingram (Y)	Wealthy (Y-R)
Mammoth Black Twig (Y-R)	York Imperial (Y-R)	Salome (Y-R)
Sheriff (Y-R)	Ben Davis (Y-R)	Patten Greening (Green)
Ralls Genet (Y-R)	Gano (Y-R)	
Red June (R)	Northwestern (Green)	
Northern Spy (Y-R)	Missouri Pippin (Y-R)	
Pewaukee (Y-R)	Grimes Golden (Y)	
	McMahon (Y)	
	McIntosh (R)	

Note: R—red colored; Y—yellow colored.

In this list all the red apples are among the susceptible or moderately susceptible varieties. This would seem to justify to some extent the

conclusion of Erikkson, but such evidence cannot be taken as conclusive.

The Russian varieties are as a class more susceptible to injury than the native American varieties, this being well illustrated in the case of injury to apples by Bordeaux mixture. In this country it is plainly evident that, as a whole, the crab varieties are more susceptible to disease attack than the standard varieties. This is especially evident in the case of scab and blight.

SUMMARY.

Introduction. Previous to the writing of this thesis no attempt has been made to gather complete information of this sort. That embodied here has been taken from works available at the University of Wisconsin. Among them are included bulletins and reports from the various American experiment stations and the United States Department of Agriculture, as well as from other parts of the world, and standard works on plant pathology and horticulture. Information was also received by letters from fruit growers and government experts, and by personal interviews with men well versed in such knowledge. The collection has been made as complete as possible for Wisconsin and as far as important publications are concerned for the entire United States. The following summary gives a brief survey of each disease treated in the text.

Fire Blight. In considering the proportion of varieties resistant to and those susceptible to the disease treated here, it is found in the case of fire blight that the number is pretty evenly divided. There is, moreover, an apparent contrast, that is, varieties are either susceptible or resistant, very few being mentioned as moderately susceptible, among either the pears or apples.

Scab. With scab most apple varieties appear to be only moderately susceptible although the susceptible and resistant varieties are about equally numerous. Pears appear to be for the most part resistant to scab, but those varieties attacked usually suffer more severely than do apple varieties from this disease. In some cases varieties immune to fire blight are likewise immune to scab, while other varieties immune to one disease may be very susceptible to the other.

Bordeaux Injury. The varieties of apple immune to Bordeaux injury are about as numerous as those affected by it. Here again is an excellent example of a case where a variety immune to one trouble is susceptible to another. As previously stated (Hedrick 1907:142) those varieties which were found resistant to scab were very susceptible to Bordeaux injury while those quite susceptible to scab did not suffer from the spray. Pears were found mostly susceptible to Bordeaux injury the greater number suffering considerable damage.

Bitter Pit. The degree to which apples may suffer bitter pit is regulated largely by existing conditions in the area to which the disease may be limited. Apple varieties are quite generally affected.

Pear Leaf-blight. In the case of pear leaf-blight the Bartlett which is very susceptible to fire blight is mentioned among the susceptible varieties to this disease. The Kieffer and Duchess, resistant to fire blight, are alike resistant to leaf-blight. Consequently the same resistant characters may fortify against these two diseases.

Rust. The apples distinctly resistant to and those susceptible to rust are about equal in number, but when including those varieties mentioned as only moderately susceptible it might be said that they are mostly resistant.

Sooty Blotch and Apple Blotch. The sooty blotch and apple blotch are both found on the lighter colored varieties, some varieties being subject to both diseases.

Nature and Cause of Disease Resistance. Although several suggestions have been made as to causes of resistance and the theories which may be advanced may hold good in some cases, they may be entirely overthrown in the case of the other varieties. It is therefore evident that nothing definite is known regarding either the nature or cause of resistance.

THE ECONOMIC STATUS OF THE CODLING MOTH IN WISCONSIN.

H. G. SMITH.

The Codling Moth is the insect which ranks first in economic importance in Wisconsin. It produces the wormy apple with which we are all familiar and which we do not desire. Seventy-five to ninety per cent of the apple crop is injured annually; this expressed in other terms amounts to two hundred thousand dollars. Wisconsin has orchards numerous enough to produce sufficient quantities of apples for its own consumption, yet many carloads of this important crop are imported each year. Generally speaking every farmer has fruit trees which with proper care would amply supply him with fruit. At present nearly every farmer buys the apples he uses or gets along without them. This being true, Wisconsin farmers and fruit growers should give more attention to the control of the Codling Moth. The trite saying, "That years ago we had no apple worm" is no remedy to the situation, for wherever apples are produced the pest is sure to follow. There are only a few sections in this state now that are not infested.

To intelligently control any insect it is necessary to know whether the insect is sucking or chewing and in what stage of its life history it does its damage. In brief the life history of the Codling Moth

which extends over a period of fifty-six days is as follows: The moth lays its eggs shortly after the petals fall, upon the foliage and fruit, but largely on the foliage. In six to twelve days the eggs hatch. The young larvae instinctively begin feeding on the foliage or fruit and at the same time make their way to the fruits. Approximately eighty per cent of the larvae enter the fruit through the calyx end. The remainder enter from the sides. The larvae feed and grow within the fruit for about twenty days, when they emerge; seek hiding places, as under loose bark, boards or rubbish about the orchard; and spin their cocoons. Here the larvae pupate and emerge from the cocoon in about twenty days as full grown moths. This then completes the life cycle.

The second brood is produced similarly to the first. There is a slight difference in that the moths lay their eggs largely on the fruit and only twenty per cent of the larvae enter the fruit at the calyx end. It is this second brood that causes the most injury to the apple crop. Thus the greatest precautions should be taken in destroying the first brood for it is the parent of the second.

Many methods of controlling the Codling Moth have been used but practically only one merits attention, that of spraying with arsenicals. Paris green and arsenate of lead have been found most suitable for the purpose for now you are aware of the fact that the insect is a chewing insect. The time for applying the poison for the first brood is just after the petals have fallen. At this time advantage is taken of the open calyx and the upright position of the young fruit. Two other applications similar to the first should be applied at intervals of ten to fourteen days. This insures almost perfect control of the first brood. The few larvae which escape the early sprayings produce the second brood; and to control it a fourth application should be made about July fifteenth in the southern part of the state and ten days later in the northern part of the state. Every farmer and fruit grower can carry out these spraying operations either singly or in coöperation with his neighbors. The expense and trouble will be amply paid by a ninety per cent crop of apples instead of a twenty per cent crop.

NATIONAL CONTROL OF PESTS AND PARASITES.

E. A. SEATON.

Perhaps some of you may have known a person, friend or relative, who went out west to new lands and settled in one of those young fruit districts. And how glowingly they wrote of the wonderful possibilities out there, how bountifully everything yielded, how large and luscious the fruits were, and especially how free was everything from disease and insect pests! That was a true condition at first, but soon with the

advance of settlements, the potato bug, the codling moth, the pear blight and the host of fungous diseases that we must always combat were there too, and had to be fought.

The whole United States was once like those newly settled districts, and our fathers can tell stories of fruits here that will rival the wildest dreams of Bitter Root. But why the changed condition between those days and these? It is largely due to this fact: that half our pests are of foreign origin, and among that half are the most troublesome and expensive ones. Here is a partial list of them and their damages: codling moth, $16,000,000 annually; Hessian fly, $50,000,000 to $100,000,000; cotton boll weevil, $25,000,000; San Jose scale, $10,000,000. These are the big offenders. Some others of less general importance are the asparagus beetle, cabbage worm, pea weevil, oyster shell bark louse, and the gypsy and brown tail moths. The annual destruction caused by insects totals near a billion dollars, one-half of this being due to imported pests.

When we consider that those insects had to endure a voyage across the ocean and become established in a new environment, we can realize how easily they could all have been excluded. Rigid inspection with absolute quarantine of infected stock would have done it. In that respect we are far behind countries we consider barbarous. We are the only important power that does not have protection from diseased and insect infested nursery stock. Our lack of regulation has made us the dumping ground for diseased and inferior stock that could not pass inspection in foreign ports. Even Turkey is progressive enough to have a law absolutely prohibiting the entry of any American nursery stock.

After all that has been let in now it may seem useless to shut our doors, but even yet we can save ourselves much. For instance there are many insects of the tropical and semi-tropical fruits that are not yet here, but which if introduced would cause great damage in the south. In Europe there is a fatal disease of potatoes called the black wart. Its occurrence in a district practically puts an end to potato culture. It has been observed as close as the islands off Nova Scotia and without quarantine will next be in the United States. Germany has a law absolutely forbidding the importation of a single foreign potato. Why should not the U. S., disease free in this instance, not protect herself similarly?

Our commerce with the Orient is beginning to assume vast proportions. In the early 90's the San Jose scale was imported from China in this commerce. We know but little of the pests of China that would be dangerous here, but we do know there are other forms of scales over there quite as serious as the San Jose scale, and proper discretion would point to rigid inspection, and if necessary to an absolute quarantine of any products that may contain these pests.

Congress has dilly-dallied with this matter for near twenty years without doing a thing. In the 90's agitation was first started due to the spread of the San Jose scale. Nothing was done and meanwhile the scale has continued to spread. At the present time we stand in imminent danger of invasion by more foreign pests, and in New England the gypsy and browntail moths are almost making the hillsides desolate and regions uninhabitable. If something is not done the next ten years will see such advances made that control will be difficult if not impossible.

Congress will likely remain dilatory till public sentiment is sufficiently awakened to force their attention to such laws. Therefore the public must act and nothing would be more appropriate than for horticultural societies and horticulturists themselves throughout the country to appeal to Congress and your representatives in particular to take immediate and definite action.

CONSTITUTION AND BY-LAWS OF THE SPARTA FRUIT GROWERS' ASSOCIATION.

Adopted May, 1896. Amended March 17, 1906.

ARTICLE I.

The undersigned have associated and do hereby associate themselves together, for the purpose of forming a corporation under Chapter 86, of the Revised Statutes of the State of Wisconsin for the year 1878, and the Acts amendatory thereof and supplementary thereto. The business and purposes for which this corporation is formed is to buy, sell, market, dispose of and exchange small fruits and produce, as hereinafter set forth.

ARTICLE II.

The corporate name of this Association shall be the SPARTA FRUIT GROWERS' ASSOCIATION, and its location shall be the city of Sparta, county of Monroe, State of Wisconsin. The nature of its business shall be to buy, sell, market, and exchange, and dispose of small fruit and produce, and to do and perform such business, and to own such real estate and other property as may be necessary in carrying out the purposes thereof.

ARTICLE III.

The capital stock of said corporation shall be Six Thousand Dollars, and shall consist of three thousand shares, of two dollars each, par value.

ARTICLE IV.

The general officers of said Corporation shall be a President, Vice-President, Secretary and Treasurer, and a Board of Directors, consisting of six stockholders. The President and Vice-President shall be elected annually by the stockholders from among their number, and shall hold their offices for the term of one year, and until their successors are elected and qualified; and the Board of Directors shall also elect annually a Secretary and Treasurer from among the stockholders, each of whom shall serve for a term of one year. Such Board of Directors may provide for and elect such other officer or officers deemed by them to be necessary and for the best interest of the Corporation. At the first annual meeting of the stockholders there shall be elected six Directors, one-third of whom shall be elected for a term of one year, one-third for a term of two years, and one-third for a term of three years; and at each annual election there shall be elected two Directors for the term of three years.

ARTICLE V.

The principal duty of the President shall be to preside at all meetings of the Board of Directors, and of the stockholders, and to have general supervision of the affairs of the Corporation. He shall sign all orders drawn on the Treasurer by the order of the Board of Directors, and all certificates of stock issued, and shall have a vote on all questions pending before the Board of Directors.

In the absence of the President, the Vice-President shall perform the duties of President.

The principal duties of the Secretary shall be to countersign and draw all orders upon the Treasurer for the payment of money, and all certificates of stock issued by the Corporation, and keep an accurate account of all moneys received or disbursed by the Corporation or any of its officers or members thereof, as shall be reported to him, and to keep all records and accounts of such Corporation, and also be the Clerk or Secretary of the Board of Directors or stockholders, and keep a correct record thereof. He shall keep a stock record in which shall be registered all stock issued by the Corporation, with the names of the stockholders and all transfers thereof.

The principal duties of the Treasurer shall be to keep and pay over, on the order of the President and Secretary all moneys disbursed by

such Corporation, and account for all moneys that come into his hands, for, or on account of, said Corporation, and the vouchers for moneys disbursed and all property of said Corporation on hand, and what, if any, disposition has been made thereof, and any other or further duties as shall be required of him by the Board of Directors.

The Board of Directors may provide for the appointment of any additional officers, as may be deemed necessary, and for the best interests of the Corporation, and may provide that any two offices may be held by the same person. All such officers shall perform, from time to time, any other or further duties, as shall be required of them by the Board of Directors, or as may be prescribed by the by-laws or regulations of the Corporation. The Board of Directors shall be governed by these articles and by the general directions laid down for their government in any by-law, rule or regulation of the Corporation, adopted by them or the stockholders at any regular meeting, and they shall also obey any specific direction regarding the management of the affairs of the Corporation, given by a vote of the stockholders at any legal meeting, of a majority thereof.

ARTICLE VI.

Any person, at the discretion of the Board of Directors, may become a member of said Corporation by subscribing for one or more shares of stock thereof, and shall have one vote for each share so held by him in any and all meetings of the stockholders. Any stockholder may, in writing, authorize any other stockholder to appear and vote for him at any meeting of the stockholders.

ARTICLE VII.

The stock of the Corporation shall not be assessable, except by a two-thirds vote of the Board of Directors. Any stock or shares issued, shall be transferable by assignment upon the certificate, and shall be entered upon the books of the Corporation. The amount of dividends upon the stock or shares, earned by the Corporation, and the time of payment thereof, shall be determined by the Board of Directors, and be payable in like manner as any other money is disbursed by the Corporation.

ARTICLE VIII.

Only stockholders, according to the rules and regulations of the Corporation, shall be members thereof, and have a voice or vote in any of the affairs of such Corporation.

ARTICLE IX.

The Annual Meeting, after the first meeting of the stockholders for the election of directors and such other business as may properly come before it, shall be held on the First Saturday of May, and on the same day in the same month of each year.

After the adoption of these amendments, and commencing with the First Saturday of February, 1907, the annual meeting shall be held on the First Saturday of February in each year. The first meeting of the stockholders for the purpose of organizing, shall be held on the 30th day of May, 1896, at 2 o'clock p. m.

Special meetings of the stockholders may be called by the President, or any two of the Board of Directors, by giving personal notice, or by mail to each stockholder, at his last known place of residence, of the time and place of holding such meeting and the object thereof, or by publication of such notice in a public newspaper, published in the city of Sparta, Wisconsin, not less than five days prior to the time of holding such meeting. Such special meetings may also be called by request in writing of the President of the Board of Directors, signed by at least ten stockholders. Upon receiving such application, it shall be the duty of the President of the Board of Directors to immediately call such meeting so demanded in the manner herein-before indicated.

ARTICLE X.

The Treasurer and Secretary shall each give bonds for the faithful discharge of their duties in such manner and for such sum as the Board of Directors shall determine, with sufficient sureties to be approved by said board.

ARTICLE XI.

When a vacancy shall occur in the Board of Directors, for any reason whatever, the remaining members shall have the power and it shall be their duty to at once call a meeting of the Board of Directors to fill such vacancy, and such vacancy shall be filled from the stockholders, and the appointee shall hold his office for the remainder of the unexpired term.

The time of commencement of the Corporation shall be the 30th day of May, 1896, and the period of its duration shall be twenty years.

ARTICLE XII.

The highest amount of indebtedness or liability of this Corporation shall not exceed the amount of its subscribed capital.

ARTICLE XIII.

The names and residence of the persons forming the Corporation or Association are as follows: C. E. Tobey, E. A. Richardson and Jesse D. Searles, all of Sparta, Wisconsin.

ARTICLE XIV.

The following named persons shall constitute the Board of Directors until the first annual meeting held to elect Directors, to wit: W. H. Hanchett, E. W. Babcock, C. E. Tobey, Jesse D. Searles, E. A. Richardson and Alexander McIntyre; and L. S. Fisher shall act as President; W. H. Hanchett shall act as Vice-president; C. G. Hettman shall act as Treasurer; and T. M. Bowler shall act as Secretary of said Corporation, until the First Annual Meeting and election of officers thereof.

ARTICLE XV.

These articles may be amended by resolution setting forth such amendment, adopted at any meeting of the stockholders, by a vote of at least two-thirds of all stock of said Corporation then outstanding.

BY-LAWS.

ARTICLE I.

SECTION 1.—A majority of votes shall constitute an election.

ARTICLE II.

SEC. 1.—The Secretary shall keep a book to be called the Roll of Members, in which shall be legibly written the Articles of Incorporation, in which all members of the Association shall be enrolled.

Sec. 2.—He shall notify all persons of their election within five days after such election.

ARTICLE III.

SEC. 1.—The Treasurer shall be custodian of all the money of the Association.

SEC. 2.—He shall execute a bond to the Association in such sum and with such sureties as the Board of Directors shall direct, which bond shall be approved by the President of the Board of Directors.

ARTICLE IV.

SEC. 1.—The Board of Directors shall hold meetings as often as the interests of the Association may require.

SEC. 2.—The Directors shall have charge of all property, effects and assets of the Association, and have the management and general superintendency of the interest and affairs, where the same do not conflict with the By-Laws.

SEC. 3.—They shall be the purchasing agents of the Association.

SEC. 4.—They shall make rules for the Association, by which its members shall be governed, and any other regulation, not inconsistent with the By-Laws.

SEC. 5.—The Directors shall examine and audit all bills against the Association.

SEC. 6.—The Board of Directors shall have the power, and it shall be their duty to withhold such a percentage of all sales as they shall deem sufficient to pay all expenses of a legitimate nature incurred by the Association in the transaction of its business, after all losses from uncollectable accounts shall have been deducted.

SEC. 7.—At the close of the season after all expenses have been paid, any surplus of moneys so retained shall be paid the members as a pro rata dividend on their season's sales, in final settlement of their season's accounts.

SEC. 8.—At any regular meeting, or adjourned meeting, four of such Directors shall constitute a quorum to do business.

SEC. 9.—For any violation of the By-Laws of this Association, it shall be within the power of the Board of Directors to impose such penalty as they deem proper, not inconsistent with the provisions of the Statute under which this Corporation is organized.

ARTICLE V.

SEC. 1.—The manner of marketing fruit and produce, in general terms shall be as follows: All fruit and produce shall be delivered to the Association as the Board of Directors may direct, each grower being obliged to have his or her name stenciled upon each package so delivered by them. When deemed necessary the fruit or produce shall be graded by a competent grader as the Board of Directors may direct; each day's sales shall be treated as an entirety and shall be prorated according to grade, share and share alike; the fruit or produce of any member may he rejected at any time if in an unmarketable condition, or put up with an evident intent to defraud.

ARTICLE VI.

SEC. 1.—These By-Laws may be amended by a two-thirds vote of members present at any legal meeting.

SEC. 2.—Any person wilfully violating any of the By-Laws of this Association, shall, at the discretion of the Board of Directors, forfeit their membership in the Association. Any stock held by any person whose membership has been so declared forfeited shall revert to and become the property of the Association, on the payment of all moneys advanced by such person for stock held by them. Such payment not to exceed the par value of said stock.

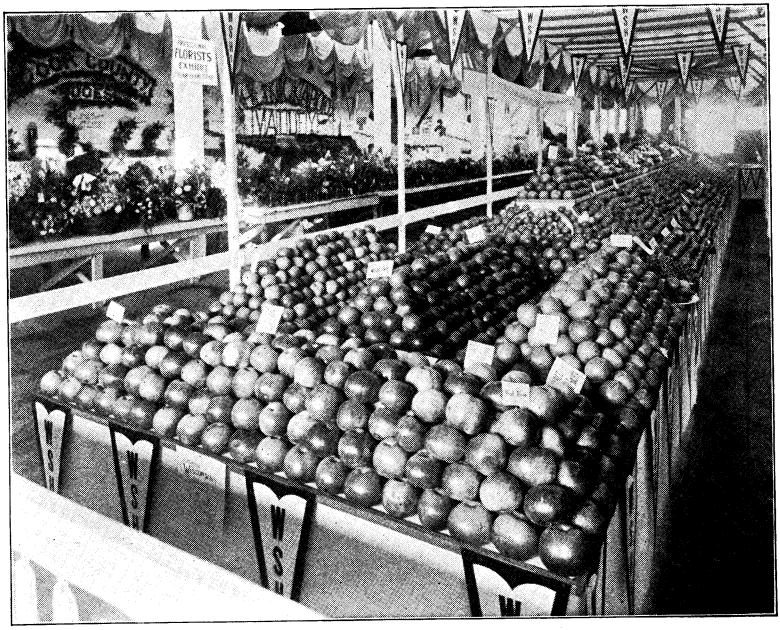
ARTICLE VII.

SEC. 1.—All business at any regular meeting shall be conducted according to parliamentary rules.

ORDER OF BUSINESS.

Calling of roll of officers.
Reading minutes.
Reports of committees.
Bills against the Association.
Unfinished business.
New business.
General welfare.

*



Society Exhibit, 1913 State Fair. View from South Entrance.

ANNUAL REPORT

OF THE

Wisconsin State Horticultural Society

For the Year 1914

VOL. XLIV

F. CRANEFIELD, Editor.
MADISON, WIS.

MADISON, WISCONSIN
DEMOCRAT PRINTING COMPANY, STATE PRINTER
1914

LETTER OF TRANSMITTAL

MADISON, WIS., MARCH 1, 1914.

To His Excellency, FRANCIS E. MCGOVERN,

Governor of Wisconsin.

DEAR SIR:—I have the honor to transmit to you herewith the Forty-fourth Annual Report of the Wisconsin State Horticultural Society.

Respectfully,

FREDERIC CRANEFIELD,

Secretary.

TABLE OF CONTENTS

PAPERS AND DISCUSSIONS

TRANSACTIONS SUMMER MEETING

OFFICERS AND COMMITTEES, 1914

OFFICERS.

J. S. PALMER, President ..... Baraboo
F. KERN, Vice President ..... Bayfield
L. G. KELLOGG, Treasurer ..... Ripon
F. CRANEFIELD, Secretary ..... Madison

EXECUTIVE COMMITTEE.

J. S. Palmer ..... Ex Officio
F. Kern ..... Ex Officio
L. G. Kellogg ..... Ex Officio
F. Cranefield ..... Ex Officio
1st Dist., A. J. Smith ..... Lake Geneva
2nd Dist., R. J. Coe ..... Fort Atkinson
3rd Dist., Lewis Post ..... Madison
4th Dist., Jas. Livingstone ..... Milwaukee
5th Dist., Henry Wilke ..... Milwaukee
6th Dist., N. A. Rasmussen ..... Oshkosh
7th Dist., Wm. Toole ..... Baraboo
8th Dist., Howard Smith ..... Aurorahville
9th Dist., A. W. Lawrence ..... Sturgeon Bay
10th Dist., C. L. Richardson ..... Chippewa Falls
11th Dist., F. V. Holston ..... Bayfield

BOARD OF MANAGERS.

J. S. PALMER L. G. KELLOGG F. CRANEFIELD

COMMITTEE ON TRIAL ORCHARDS.

L. G. KELLOGG, term expires..... Jan. 1917.
J. A. HAYS, term expires..... Jan. 1916.
N. A. RASMUSSEN, term expires..... Jan. 1915.

LOCATION OF TRIAL AND DEMONSTRATION ORCHARDS.

Wausau, Marathon county, 10 acres..... Established 1897.
Poplar, Douglas county, 7 acres..... Established 1904.
Maple, Douglas county, 3 acres..... Established 1906.
Manitowoc, Manitowoc county, 6 acres..... Established 1907.
Gays Mills, Crawford county, 8 acres, (1 A Grapes).. Established 1907.
Whitehall, Trempealeau county, 5 acres..... Established 1908.
Lake Geneva, Walworth county, 8 acres..... Established 1908.
Sparta, Monroe county, 1 acre (Grape Station)..... Established 1908.
Pewaukee, Waukesha county, 3 acres..... Established 1912.
Baraboo, Sauk county, 3 acres..... Established 1912.
Holcombe, Chippewa county, 3 acres..... Established 1913.

CONSTITUTION

Article 1. This Society shall be known as "The Wisconsin State Horticultural Society" and its location shall be at the city of Madison, Dane county, Wisconsin, where its principal office shall be maintained.

Article 2. The object of this Society shall be the advancement of the art and science of horticulture throughout the state.

Article 3. This Society is formed without capital stock.

Article 4. This Society shall consist of life members, annual members, honorary life members, and honorary annual members. Wives of such members shall be entitled to the privileges of full membership. The fees for membership shall be fixed by the Executive Committee.

Honorary annual members may, by vote, be elected and invited to participate in the proceedings of the Society. Honorary life members shall be elected by vote of the Society, and shall be distinguished for special merit in horticultural and kindred sciences, or shall confer some particular benefit upon the Society.

Article 5. The general officers of the Society shall be a President, Vice President, Secretary, Treasurer and an Executive Committee, consisting of the foregoing officers and one additional member from each congressional district, a majority of whom shall constitute a quorum at any of its meetings.

The officers aforesaid, except the Secretary, shall be elected, by ballot, at the annual meeting, and shall hold office for one year thereafter and until their respective successors are elected. The Secretary shall be appointed by the Executive Committee at its annual meeting after the election of officers and shall hold office for one year thereafter or until his successor is appointed.

Article 6. The principal duties of the general officers shall be as follows:

The President shall preside at all meetings of the Society and of the Executive Committee, shall exercise a general supervision and control of the business and affairs of the Society, and shall sign all leases, deeds and instruments for the transfer, conveyance or assignment of the corporate property, and all contracts, papers and instruments necessary or convenient in the transaction of the business of the Society, and when necessary, acknowledge the same.

The Vice President shall act as President in case of the absence, disability or removal of the President.

The Secretary shall conduct the general correspondence of the Society and keep a record of the business and of the proceedings at all meetings of the Society and of the Executive Committee; he shall keep, safely and systematically, all books, records, papers and documents belonging or pertaining to the Society or the business thereof; he shall countersign all deeds, leases and conveyances, and, when necessary, acknowledge the same.

The Treasurer shall receive and safely keep all moneys, notes, securities and property of the Society, which may come into his hands and shall pay out or dispose of the same only upon such terms and conditions as the Executive Committee may direct or the by-laws provide. He shall keep a correct account of all moneys received and disbursed and shall render such account of the same as shall be required by the Executive Committee or prescribed in the by-laws. And he shall execute a bond to the Society, in such sum, and with such sureties, as the Executive Committee shall approve, conditioned upon the faithful performance of his duties, and for the payment and delivery to his successor of all the moneys and property of the Society in his hands or under his control; which bond when approved shall be filed with the Secretary.

The said officers shall perform such other or additional duties as may be required and any of the duties and powers of said officers may be performed or exercised, as far as is lawful, by such other officers, persons or committees as the Executive Committee may provide.

Article 7. The members of the Executive Committee from the several congressional districts shall be chosen by the delegates of their respective county or local societies present at the annual meeting of this Society, or in the case of the absence of delegates from such societies or in case of failure to elect, such members shall be chosen from among the members of this Society present from such districts. But if any district is not represented the vacancy shall be filled by vote of the members of this Society present at the annual meeting.

Article 8. The term "County and Local Horticultural Societies" shall include any organization that shall have for its object the advancement of the interests of its members in the growing or sale of horticultural crops; provided that such society acts by authority of a regularly adopted constitution and makes an annual report to the Secretary of the state society.

Article 9. The Society shall hold its annual meeting for the election of officers, exhibition of fruits, and discussions, in the city of Madison, Wisconsin. Other meetings shall be held at such time and place as the Executive Committee may direct.

Article 10. Only persons holding memberships according to the regulations of the Society shall be members of it.

Article 11. This Constitution, with the accompanying by-laws, may be amended, at any regular meeting of this Society by a two-thirds vote of the members present; provided that such amendment is presented in writing.

RULES AND BY-LAWS

Article 1.—Membership.

Sec. 1. The Secretary shall decide upon all applications for membership in accordance with the Constitution and By-laws of the Society.

Sec. 2. Any member maliciously or intentionally injuring or working in opposition to the Society or its purposes in promoting horticulture may upon return of his membership fee be summarily expelled.

Article II.—Meetings.

Sec. 1. The Executive Committee may fix the time and place for holding the annual meeting of the Society, if the last meeting thereof failed to do so and may call such meeting by giving at least thirty days' notice to each member. Such notice shall be given by the Secretary, by mailing the same, postage prepaid, to each member at his last known address.

Sec. 2. Notice of a special meeting shall be mailed to each member at his last known address by the Secretary at least six days before such meeting is to be held. Such notice shall state the business to be transacted and the date, hour and place of meeting, and no business other than that stated in the notice shall be considered at such meeting.

Article III.—Duties of Officers—The President.

Sec. 1. The President shall preside at all meetings of the Society and of the Executive Committee; he shall, with the advice of the Secretary, call all meetings of the Society if the Executive Committee fail so to do; he shall appoint the delegates to the meetings of the other State Horticultural Societies; he shall have a general supervision of the business and affairs of the Society, and he shall deliver an annual address upon some subject connected with horticulture.

Sec. 2. He shall sign and acknowledge all leases, deeds, and instruments for the conveyance or transfer of the Society's property; and all other contracts, papers and instruments necessary or convenient in transacting its business.

Sec. 3 He shall sign all orders drawn on the treasurer for the payment of bills, accounts and claims audited by the Board of Managers and none other.

Sec. 4. In case of the absence from any cause of both the President and Vice President the members present, if a quorum, shall elect one of their number temporary president.

Article IV.—The Secretary.

Sec. 1. The Secretary shall attend to all the correspondence of the Society, he shall keep a correct and complete record of the business and of the procedings at all meetings of the members and of the Executive Committee.

Sec. 2. He shall superintend the publication of the Reports of the Transactions of the Society and publish or cause to be published such special bulletins on timely and appropriate subjects and such special reports of the condition and results of experimental work in the Trial Orchards and Trial Stations as the Board of Managers may direct.

Sec. 3. He shall present a detailed report of the affairs of the Society at its annual meeting. He shall endeavor to secure reports from the various committees, and from local societies of the condition and progress of horticulture throughout the state and report the same to the Society. It shall be his duty to make a report to the Governor of the State of the transactions of the Society according to the provisions of the statutes for state reports.

Sec. 4. He shall be superintendent of all Trial Orchards and Trial Stations. In that capacity he shall supervise the planting and cultivation of, and exercise general control over the same, subject to the directions of the Trial Orchard Committee.

Sec. 5. He shall engross in the general record book of the Society a true copy of the Constitution, Rules and By-laws, and all amendments thereto and all resolutions of the Society and of the Executive Committee.

Sec. 6. He shall keep a record book in which shall be entered the names of all members of the Society from its organization, the place of residence, time of acquiring membership, and time of cessation of same.

Sec. 7. He shall notify all persons elected to office within ten days thereafter, if such persons were not present at the election.

Sec. 8. He shall keep a book in which a correct list of the property of the Society shall be entered. He shall draw all orders, checks, etc., ordered by the Executive Committee or Board of Managers and countersign the same when signed by the President.

Sec. 9. He shall keep a stub or record of all orders, checks, etc., drawn and delivered, showing the date and amount thereof and to whom and for what purpose the same was issued.

Sec. 10. He shall receive all fees for membership, give proper receipts for the same, and unless otherwise directed by the Executive Committee, shall pay the money to the Treasurer, taking his receipt therefor.

Article V.—The Treasurer.

Sec. 1. The Treasurer shall, before entering upon the duties of his office, execute a bond to the Society in such sum and with such sureties as the Executive Committee may direct, conditioned as provided in the Constitution.

Sec. 2. He shall receive and be responsible for the safe keeping of all money, notes, securities, credits etc., of any and every nature, belonging to the Society which shall come into his hands.

Sec. 3. He shall keep proper books of account and a true and complete record of all business transacted by him for the Society; he shall keep proper vouchers for all money disbursed and shall render such accounts and statements of the moneys received, disbursed and on hand, and generally of all matters pertaining to his office as the Executive Committee may require or the By-laws direct.

Sec. 4. He shall disburse the money of the Society only on the written order of the President, countersigned by the Secretary, and shall make an annual report of the receipts and disbursements and furnish the Secretary with a copy of the same on or before the first day of the Annual Meeting.

Article VI.—The Executive Committee.

Sec. 1. The Executive Committee shall have the general care and management of the property, affairs, and business of the Society, and a majority of its members shall constitute a quorum. The President and Secretary of the Society shall be President and Secretary of the Executive Committee.

Sec. 2. Meetings of the Committee may be called by the President, the Secretary, or by the Secretary on the written request of five of its members.

Sec. 3. They shall fix the amount of the Treasurer's bond, the number of his sureties and approve the same. They may require any other officer, agent, or employee of the Society to execute a bond and prescribe the amount and conditions thereof, and approve the same.

Sec. 4. They may prescribe such salary or compensation for any officer, agent, or employee of the Society as they may deem proper, but not for a longer term than until the next annual meeting of the members, nor shall any officer of the Society be entitled to or receive any benefit, salary or compensation for, on account of, or during the time that he may be absent beyond the boundaries of the state unless such absence was at the request and on behalf of said Society.

Sec. 5. The Executive Committee shall have the power to remove any officer for official misconduct or neglect of the duties of his office. In case of vacancy in any office, either by resignation, removal or otherwise, such vacancy shall be filled by appointment by the said Committee, but such person shall hold office only for the unexpired portion of the term.

Sec. 6. The Executive Committee shall make such rules and regulations for the conduct of the business of the Society, not inconsistent with law, the Constitution, or the Rules and By-laws, as they shall deem expedient and for the best interests of the Society.

Article VII.—Committees.

Sec. 1. The President, Treasurer and Secretary shall constitute a Board of Managers which may conduct any business deemed necessary for the Society in the absence of the Executive Committee. All bills against the Society must be audited by the Board of Managers before being paid.

Sec. 2. Regular meetings of the Board of Managers shall be held bi-monthly to audit accounts and transact other business; special meetings may be called by any member of the Board.

Sec. 3. The president shall annually appoint the following standing committees—

Committee on Finance of three members, and one member of the committee on Trial Orchards and Trial Stations, of three members, to be appointed for a term of 3 years, and such other committees as may from time to time be necessary.

Sec. 4. It shall be the duty of the Finance Committee to settle with the Treasurer and to examine and report upon all bills and claims against the Society which may have been presented and referred to them, provided, however, that no member of the Executive Committee shall be a member of the Finance Committee aforesaid.

Sec. 5. The Trial Orchard Committee shall have general control of the locating, planting and care of all trial orchards and trial stations, and may visit collectively each orchard and station once each year or oftener if deemed necessary. Meetings of the Committee may be called at any time by the President of the Society or by the Superintendent of Trial Orchards.

Article VIII.—Miscellaneous.

Sec. 1. The foregoing Rules and By-laws shall take effect and be in force from the date of their adoption.

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 southern part of the state in the counties bordering on Lake Michigan: **Baldwin, Eureka, Fallawater, Gano, King, Northern Spy, Pewaukee, Willow Twig, York Imperial, Bellflower.**

APPLES (Commercial Orchard List).

It is generally conceded that a commercial orchard should consist of but few varieties; the following are suggested: **Dudley, Fameuse, Longfield, McMahan, McIntosh, Northwestern Greening, Oldenburg, Scott, Utter, Wealthy, Yellow Transparent.**

APPLES (Five Varieties for Farm Orchard).

Northwestern Greening, Oldenburg (Duchess), Talman (Sweet), Wealthy, Astrachan.

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, Wolf.

EUROPEAN PLUMS.

(Not recommended except along Lake Shore). **Lombard, Green Gage, Moore's Arctic.**

JAPAN 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.

Aroma, 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, Plum Farmer.**
Red: **Cuthbert, Loudon, Marlboro.**
Purple: **Columbian.**

CURRANTS.

Red: **Red Cross, Red Dutch, Long Branch 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 south-eastern 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.

b.—Hort.

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.*

Common Name.	Scientific Name.
Thunberg's Barberry	Berberis Thunbergii
Common Barberry	Berberis vulgaris
Purple-leaved Barberry	Berberis vulgaris var. atropurpurea
Purple Filbert	Corylus maxima var. purpurea
Weigela (rose)	Diervilla florida
Weigela (white)	Diervilla candida
Weigela (Eva Rathke)	Diervilla hybrida
Desbois Weigela	Diervilla hybridia var. Desboisii
Silver Berry	Eleagnus argenta

*From bulletin 108, Wisconsin Experiment Station, by F. Cranefield.

Strawberry Tree ..... Euonymus Europaeus
Althea ..... Hibiscus Syriacus
Sea Buckthorn ..... Hippophae rhamnoides
Garden Hydrangea ..... Hydrangea paniculata gr.
Ruprecht's Honeysuckle ..... Lonicera Ruprechtiana
Tartarian Honeysuckle ..... Lonicera Tartarica
Tea's Weeping Mulberry ..... Morus Alba var.
Mock Orange ..... Philadelphus coronarius
Golden Mock Orange ..... Philadelphus coronarius var. aurea
Mock Orange large fl ..... Philadelphus inodorus
Shrubby Cinque Foil ..... Pontentilla fruticosa
Russian Almond ..... Prunus Nana
Rhodotypos ..... Rhodotypos kerrioides
Smoke Bush ..... Rhus Cotinus
Missouri Flowering Currant ..... Ribes aureum
Rose Acacia ..... Robinia hispida
Japanese Rose ..... Rosa rugosa
Golden Elder ..... Sambucus nigra var. aurea
Buffalo Berry ..... Shepherdia argentea
Bumalda Spiraea ..... Spiraea Bumalda
Anthony Waterer Spiraea ..... Spiraea Bumalda var.
Billard's Spiraea ..... Spiraea Billardii
Douglas' Spiraea ..... Spiraea Douglassi
Japanese Spiraea ..... Spiraea Japonica
Meadow Sweet Spiraea ..... Spiraea salicifolia
Van Houten's Spiraea ..... Spiraea Van Houtte
Persian Lilac ..... Syringa Persica
Chinese Lilac ..... Syringa villosa
Common Lilac ..... Syringa vulgaris
Amur. Tamarix..Tamarix Pallassi Desv. (Tamarix Amurense Hort.)
Snowball ..... Viburnum Opulus vr. sterile

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, Russell's Cottage, Seven Sisters, Gem of the Prairies, Crimson Rambler, Dorothy Perkins.

Five hybrid perpetual roses for the garden: General 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)	Mock Orange
Lilac, Common	Honeysuckle, Slender
Lilac, Japanese	Sea Buckthorn
Golden Elder	Honeysuckle, Tartarian
Lilac Jossika's	Siberian pea tree (tall)
Honeysuckle, Fly	Honeysuckle, Tartarian white

Medium—6 to 10 Feet.

Barberry, purple	Spiraea Douglas
Crandall Currant	Purple Filbert
Silver Berry	Spiraea, Three-lobed
Honeysuckle, Blue	Rose Acacia
Strawberry Tree	Spiraea, Van Houten's
Japanese Rose	Russian Almond
Spiraea, Billard's	Weeping Mulberry
Lilac, Chinese	Siberian Pea tree (dwarf)
Lilac, Persian	Wiegelas

Dwarf—2 to 6 Feet.

Althea	Honeysuckle, Albert's
Spiraea, Anthony Waterer	Spiraea, Japanese
Barberry, Thunberg's	Hydrangea
Spiraea, Ash-leaved (Sorbaria)	Spiraea, Meadow Sweet
Cinque Foil	Rhodotypos
Spiraea, Bumalda	Spiraea, Plum-leaved

A LIST OF NATIVE SHRUBS DESIRABLE FOR PLANTING ON HOME GROUNDS.

Common Name.	Scientific Name.
Bearberry	Arctostaphylos Uva-ursi
New Jersey Tea	Ceanothus Americanus
Button Bush	Cephalanthus occidentalis
Prince's Pine	Cimaphila umbellata
Round-leaved Dogwood	Comptonia aspleniflora
Red Oiser Dogwood	Cornus stolinifera
Leatherwood (Wickopy)	Dirca palustris
Trailing Arbutus	Epigaea repens
Wahoo	Euonymus atropurpureus
St. John's Wort	Hypericum pyramidatum
Winterberry (Holly)	Ilex verticillata
Trailing Juniper	Juniperus procumbens
Sweet Gale	Myrica Gale
Ninebark	Physocarpos' opulifolia
Buckthorn	Rhamnus catharticus
Staghorn Sumac	Rhus Typhina
Smooth Sumac	Rhus Glabra
Dwarf Sumac	Rhus copallina
Wild Red Currant	Ribes Rubrum
Wild Black Currant	Ribes floridum

Wild Rose (tall) ..... Rosa lucida
Wild Rose (dwarf) ..... Rosa blanda
Purple-flowered Raspberry ..... Rubus odoratus
White-Flowered Raspberry ..... Rubus Nutkanus
Common Elder ..... Sambucus Canadensis
Scarlet Elder ..... Sambucus pubens
Snowberry ..... Symphoricarpus racemosus
Coral Berry ..... Symphoricarpus vulgaris
Ground Hemlock ..... Taxus baccata
Sheepberry ..... Viburnum lentago
Black Haw ..... Viburnum dentatum
———— ..... Viburnum acerifolium
Bush Cranberry ..... Viburnum opulus
Prickly Ash ..... Zantoxylum Americanum

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.

SPRING FLOWERING BULBS.

Tulips, Single dwarf; Duc van Tholl pink, scarlet, white.
Tulip medium; red Artus, yellow Chrysolora, pink Cottage Maid.
Hyacinth single: pink Charles Dickens, white Baroness von Thuyll, blue Baron von Thuyll.
Narcissus (daffodil), Von Sion.
Crocus: Mixed.
Tulips and other Holland bulbs must be planted in September or October and bloom early in spring.

BLACK LIST

A LIST OF SHRUBS ALL OF WHICH HAVE BEEN TESTED ON THE GROUNDS OF THE EXPERIMENT STATION AT MADISON AND FOUND UNSATISFACTORY.

Common Name.	Scientific Name.
Rhododendron	Azalea arborescens
Rhododendron	Azalea viscosa
Azalea	Azalea nudiflora
Azalea	Azalea mollis
Sweet-scented shrub	Calycanthus floridus
Blue Spiraea	Caryopteris Mastacanthus
White Fringe	Chionanthus Virginica
Sweet Pepperbush	Clethra alnifolia
Bladder Senna	Colutea arborescens
Flowering Dogwood	Cornus florida
Japanese Quince	Cydonia Japonica
Daphne	Daphne Cneorum
Daphne	Daphne Mezereum
Slender Deutzia	Deutzia gracilis
Goumi	Eleagnus longipes
Pearl Bush	Exochorda grandiflora
Golden Bell	Forsythia suspensa
Snowdrop tree	Halesia tetraptera
Virginia Willow	Itea Virginica
Kerria	Kerria Japonica
Common privet	Ligustrum vulgare
Paulownia	Paulownia imperialis
Purule leaved Plum	Prunus cerasifera var. (Prunus pissardi Hort.)
Flowering Almond	Prunus Japonica
Flowering Plum (double)	Prunus triloba
Arguta Spiraea	Spiraea Arguta
Thunberg's Spiraea	Spiraea Thunbergii

The plants of certain of the above named varieties made a good growth each year but have not blossomed unless given thorough winter protection. In this class are Bladder Senna, Flowering Almond, Flowering Plum and Golden Bell.

The Japanese Quince is hardy of bush but has not borne flowers except when given winter protection. The Goumi will only bear fruit when protected in winter. The double-flowered Almond will blossom freely if given thorough winter protection, otherwise it will kill back severely. The double-flowered Plum grows well and after a mild winter will bear flowers in advance of the leaves; unreliable, however, four years out of five if unprotected.

The others of this list have either died outright or else barely survived.

POISONS USED TO DESTROY INSECTS IN ORCHARDS AND GARDENS

PARIS GREEN.

A well known poison used to destroy biting insects, as the apple worm, tent caterpillar, potato beetle, etc.

Formula

Paris Green ..... 1 to 2 lbs.
Fresh (unslacked) lime ..... 1 lb.
Water ..... 100 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. of 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 Universal Fungicide. Not a cure but a preventive of fungous diseases.

Formula

Copper sulphate .....4 lbs.
Fresh (unslacked) lime .....5 lbs.
Water .....50 gals.

Dissolve the copper sulphate 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. sulphate in 50 gals. water.

Slake 100 lbs. lime and dilute to 50 gals.

Then use the following formula:

Water .....(approximately) 45 gals.
Sulphate Solution .....2 gals.
Lime Solution .....2½ gals.

LIME SULPHUR COMPOUND.

Used to destroy San Jose Scale, Oyster Shell Bark Louse and other insects; also used as a substitute for Bordeaux mixture.

Commercial Lime Sulphur.

Lime sulphur in commercial form is generally more desirable than the homemade product. particularly that made in Wisconsin since our lime does not generally contain a high percentage of calcium. In fact commercial lime sulphur can be purchased for very little more than the cost of the ingredients which are used in the homemade wash.—Prof. J. G. Sanders.

Homemade Lime Sulphur.

(From Bulletin 16, W. S. H. S.)

Formula

Fresh (unslaked) lime .....15 lbs.
Flowers of Sulphur .....15 lbs.
Water .....50 gals.

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 slacking lime and 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 sulphur lime is a positive drawback, since it makes the wash too thick to penetrate well".

SPRAY:

WHAT?	WHY?	HOW?	WHEN?			REMARKS
			1ST SPRAYING	2D SPRAYING	3D 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 eleven different points in the state as follows:

Wausau, Poplar, Maple, Whitehall, Manitowoc, Sparta, Baraboo, Holcombe, Pewaukee, Gays Mills, Lake Geneva.

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 59 acres and 5,945 trees in addition to two acres of grapes.

The orchards at Wausau, Poplar, Maple and Holcombe, 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 or 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 undertaken the task of improving the grounds of the 7,000 rural schools of the state. 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 containing articles by experts on orchard culture, small fruit and vegetable gardening and the decoration of home grounds. Sent free to members.

Issues a monthly magazine, Wisconsin Horticulture, which is sent free to members.

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.

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 wants to know 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.

Frederic Cranefield,
Secretary W. S. H. S.,
Madison.

WISCONSIN HORTICULTURE

A WISCONSIN MAGAZINE published by the **WISCONSIN STATE HORTICULTURAL SOCIETY** containing each month articles on fruit, flower and vegetable growing written by **WISCONSIN** growers for **WISCONSIN** conditions.

In this respect it is in a class by itself. Horticultural papers published for profit must cover the whole country, or aim to do so, and sometimes the information gets pretty thin from being spread so far.

WISCONSIN HORTICULTURE is not published for the purpose of making money but exclusively for the benefit of members of the **STATE HORTICULTURAL SOCIETY.**

It is better—for **WISCONSIN** people, than any other horticultural paper published. It tells the best varieties to plant in **WISCONSIN,** the best methods of cultivation for **WISCONSIN.** It's a paper for the home gardener and fruit grower as well as for the big grower.

"WE ANSWER QUESTIONS" is the slogan of the Society. Every question answered, first by personal letter and then in the paper.

Every dollar received for fees (subscriptions) and advertising is put into the paper.

Honest nurserymen advertise in **WISCONSIN HORTICULTURE** and only that kind. The other kind cannot buy space.

The paper is worth **TEN DOLLARS** a year but may be had by any one for **FIFTY CENTS.**

This price, 50 cents, includes membership in the **STATE HORTICULTURAL SOCIETY.**

A dollar bill pays for two years.

Frederic Cranefield,
Secretary W. S. H. S.,
Madison.

TRANSACTIONS

OF THE

Wisconsin State Horticultural Society

WINTER MEETING

Madison, January 6, 7 and 8, 1914.

Tuesday Afternoon, January 6, 2 P. M.

The meeting was held at the Assembly Chamber, Capitol Building, and was called to order by President J. S. Palmer. The President then introduced Hon. J. S. Donald, Secretary of State.

Hon. John S. Donald:

Ladies and Gentlemen:—As I came through the corridor I felt that I would very much rather take part in what I saw there than to take a part in the exercises that you are holding in here. The display of fruit on exhibition would do credit to a county fair and the large variety of apples with their high color and tasty arrangement is very attractive.

However, I assure you that I am very glad indeed to have an opportunity to say a word of welcome to you. I presume that I could do so with much better grace if I were to say the keys of the city are yours while you remain. I am not in a position to say this but I do greet you as one who has raised a few apples, grapes and strawberries on the farm for family consumption, appreciating the work which you are doing and realizing that it is more easy to talk at these meetings than to do the real and actual labor of putting to use the knowledge which we already have in regard to the raising of fruit.

Your presence bespeaks your interest in the industries in which you are engaged and of which you have met to obtain more knowledge that you may better succeed in your work. I believe

that to our state rightfully belongs the credit of having the oldest horticultural society, which you are maintaining and using, for the promotion of more and better fruits on our farms and in our vineyards.

Our state has followed a policy of giving aid to various associations. Your association is now receiving $9,000 per annum and also some encouragement through agricultural societies. You are now also to be aided by a nursery inspector for which $3,000 is appropriated by the legislature. It is for you to make the most of aid that is given to you for future appropriations should be governed by the benefits derived. I feel that the appropriations that are given to the various societies and associations of this state is money well expended for this encouragement undoubtedly has been the means of assisting many societies or organizations to work and to hold together and to develop their industry. It takes money on the part of the state to do this but I believe it is returned many fold through our general prosperity. The supremacy of Wisconsin in the many industries is the best evidence that we have been getting value received. The progress in fruit growing is no exception. With increased production comes increased demand. It is hailed as beneficial as food and as healthful and in some form will be found on the table nearly every day of the year. A young man selling fruit at a stand got this idea that it is healthful to eat fruit, and he adopted this motto, "An apple a day keeps the doctor away." He was very successful in his sales. Right across the street was a man selling vegetables and observing the success of his rival, conceived the idea that he should do something of the same nature so he adopted the slogan, "An onion a day will keep everybody away." I imagine he was successful also.

I sometimes feel that we hardly appreciate the opportunities that we have in Wisconsin for the production of the more hardy fruits. We do not fully appreciate the location or position of this state here at the head of the Missisippi Valley, the largest valley with one exception in the world—the Valley of the Amazon is larger than the Mississippi. Our advantages as to climate, rainfall and soil, I think is unexcelled anywhere and the market advantages are unsurpassed. Four years ago this winter I had the privilege of spending a little time in California and I had a very good opportunity to learn something of the fruit industry in the southern part of the state. We were out from Los Angeles a little way, just in the orange growing district. A friend was a member of the local fruit packing association. It was the year of the severe freeze and I had the privilege of riding with the directors of the association when they inspected the fruit in that locality. When we talk about the restrictions of law and inspection and inspectors in this state, I do not think we appreciate what they are doing in some other places and how they are restricted and how the members of the association are willing, for the benefits derived, to live up to their rules.

The directors in visiting the orchards determined what fruit might be picked and sold through the exchange, permitting in some instances oranges to be picked from one side of the tree and not from the other owing to the condition of the fruit. Often bushels and bushels of oranges that would pass as perfect to one who was not a judge, were thrown away because their slight imperfection would have injured the reputation of the brand used by the Exchange. So far as I know, there was not a single complaint by any of the growers, but they were willing and ready to comply with the rules of picking, packing and shipping, to the last detail in order to maintain the standard of quality. We should think more of quality in all of our productions.

I do not feel that it is necessary to say very much to you growers in Wisconsin of the advantages of coöperation because we are aware that all who are talking of coöperation are looking to the horticulturists as being pioneers and the many associations which you have that are successful. I think you fully realize the advantages of coöperative growing and coöperative marketing over those of private endeavor.

I wish your society and you individually every success, and trust that your meetings will be of the greatest benefit to you and that you will realize to the fullest the object of your coming together. I thank you.

ANNUAL ADDRESS.

PRES. J. S. PALMER.

As we meet here for our 48th Annual Convention we see with pleasure many new faces and note with sadness the absence of those whom we have been accustomed to greet in years past.

Our Society at the beginning of this new year is in a prosperous condition. The change made by the legislature in taking over our accounts and auditing and paying all bills put us on a sound financial basis—as a ward of the State of Wisconsin.

To keep pace with the other increasing interests in horticultural matters, we must ever widen our field of activities and in no part of the work of the society can this be better accomplished than with our Trial Orchards.

Wherever these orchards have been planted in the newer portions of the state, they are proving a very valuable object lesson to the settlers, and are encouraging the planting and care of fruit trees.

We have many requests for the establishments of these "demonstration orchards" which unfortunately we are unable to grant, at the present, but I hope in the future the society may be able to

carry this most important branch of its work wherever there is a call.

In the management of these orchards, it would be well for this society to work out and adopt a certain and scientific method to be followed as closely as local conditions will permit, covering the work for a term of years and governing planting, cultivation, spraying, pruning, and thinning, and to this might be added, picking, grading, packing and marketing, with the most approved and up-to-date methods, thus carrying our demonstration to a logical conclusion.

Perhaps the most severe criticism our society has ever received has come from the methods employed in the management of its Trial Orchards—and in this branch of our work we can afford to make no mistakes.

Among the most valuable varieties of apples grown in Wisconsin, it is an interesting fact that the native seedling constitutes so large a portion, but with our modern methods of propagation we have little prospect of originating any more new varieties.

I believe that we should establish a nursery where the chance seedlings, found in many places may be collected and tested, seeds planted from our best varieties, with a view to originating new varieties, and perhaps some experiments in artificial cross fertilization could be worked out to add to our list of Wisconsin apples.

During the season just past, a campaign of advertising was inaugurated to call attention to the position Wisconsin occupies among the fruit growing states, and to do this, Wisconsin apples were exhibited wherever an opportunity was offered.

The first exhibit was in August, at the International Apple Shippers' Convention held in Cleveland, Ohio. Although apples at this time were only partly grown, our apple show attracted much attention and received favorable comment both at the Convention, and during the shipping season; which led to some practical results by securing markets for our apples in other states. Several prizes were awarded Wisconsin apples at this show.

The display of Wisconsin apples at the State Fair was most complete and showed that Wisconsin does grow apples of a quality to command respect in any market and in quantity worthy to be considered a very important factor in the general supply.

From the Fair the apple display was transferred to one of the most conspicuous down town windows where it made a very attractive show. At the State Fair for the first time, apples were shown in commercial packages, and this feature of the show disclosed some interesting facts. In the barrel display but a few were so packed as to arrive in a presentable condition without refacing. Some were in old salt barrels and other unsuitable packages, showing we still have much to learn in preparing our fruit for market.

At the meeting of the American Pomological Society held at Washington, in November, a very good collection of the important Wisconsin seedling made an interesting exhibit.

In the past few years the small fruit business has not received the attention that it deserves and consequently the supply is not adequate to the demand. At present no branch of the fruit business offers greater inducements than this.

In all agricultural and horticultural lines, Wisconsin occupies a very conspicuous place and our society has a reputation to sustain as leader among kindred societies. So let us all work together for the general up-building of the horticultural interests of the great State of Wisconsin.

ANNUAL REPORT.

FREDERIC CRANEFIELD, Secretary.

I take great pleasure in submitting herewith my tenth annual report as Secretary of this Society.

In the record of events for the year past there is little that is new and nothing that is startling.

It should not be inferred from this that nothing has been accomplished for all of the work heretofore initiated has been carried on satisfactorily.

Two conventions were held during the year, the annual at Madison one year ago and the midsummer meeting at Sturgeon Bay. Both were well attended and profitable, especially the Sturgeon Bay meet which afforded many of our members an opportunity to note the remarkable development of this region since our former meeting there in 1908.

The new feature of our trial orchard work for the year is the establishing of two orchards for the testing of the newer varieties of long keeping apples.

These are located at Pewaukee and Baraboo, the former on the farm of Wm. Steele, Jr., the other on the Ski-Hi fruit farm of A. K. Bassett.

When fully completed each orchard will contain five acres planted to the following varieties, one acre each: Delicious, Senator, Tuttle, Seek-no-Further, King David.

This completes the set of four orchards authorized by the Executive Committee in 1910 for the purpose of testing the newer claimants for honors as hardy, long keeping apples—the others being merely extensions of our orchards at Lake Geneva and Gays Mills.

Contrary to my usual custom no separate report as Superintendent of Trial Orchards will be submitted but instead a brief summary of the season will be given at this time.

In all of the orchards the clean-culture-cover-crop system was followed during the year and at the close of the season all were free from weeds and the ground covered by a crop of oats.

The Wausau orchard bore 1274 bushels of apples which sold for $505.00.

The apples in the Poplar orchard brought $55.00.

The yield in the Gays Mills orchard amounted to 19 barrels.

The crop at Maple, the first, sold for $13.80.

The orchards at Manitowoc, Lake Geneva and Whitehall have not yet begun to bear.

The remaining facts concerning the management, condition and prospects of the orchards will be set forth in the report of the chairman of the Trial Orchard Committee.

The Trial Orchard work to date has proven its worth and justifies in all particulars the faith and wisdom of its founders.

Not only has each of the orchards been of very great value to the particular locality in which it is located but the whole state has benefited from the work

While the applications for new orchards are constantly coming in it seems doubtful if the work can be profitably extended at the present time at least along present lines.

The fieldwork that appeals to me as being of most pressing importance is the founding of a "home for foundlings" in the apple world; in other words, a "seedling" orchard where can be brought together all of nameless offspring as well as named kinds of other states. Such an orchard might well be located in connection with one of our present orchards.

Three exhibits of Wisconsin apples were staged in 1913 and all won high honors.

An exhibit of apples from Bayfield, Sturgeon Bay, Baraboo and Richland Center shown at the Cleveland, Ohio, meeting of the International Apple Shippers Association won two ribbon prizes and a bronze sweepstakes medal in competition with the provinces of Ontario and Nova Scotia, Canada, Manie, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, New York, Michigan and Minnesota. This exhibit also received flattering notices in all the trade papers.

The State Fair exhibit which was the main feature in the horticultural building was viewed by so many people and has been so fully described in our magazine that but little need be said of it at this time.

While the main exhibit represented an outlay of about $800.00, it was readily conceded by all who saw it to be worth the price.

The special county exhibits of fruit from Bayfield, Crawford, Door and Sauk counties and the cranberry exhibit were probably the first of the kind ever staged at any state fair.

The third fruit show consisted of an extensive and complete exhibit of apples originated in Wisconsin shown at the biennial meeting of the American Pomological Society at Washington, D. C., November 22nd to 27th.

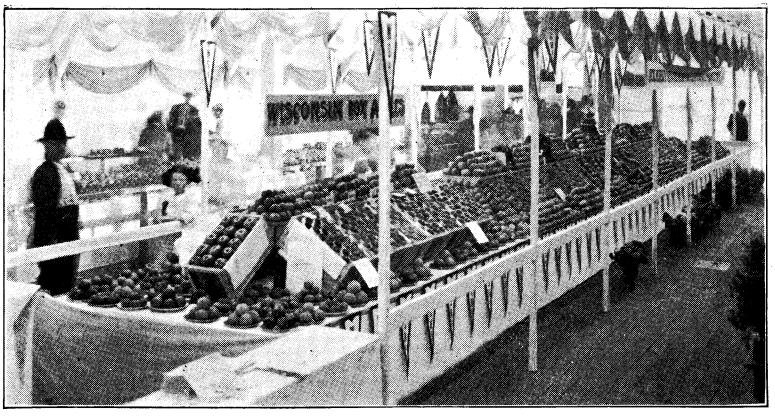
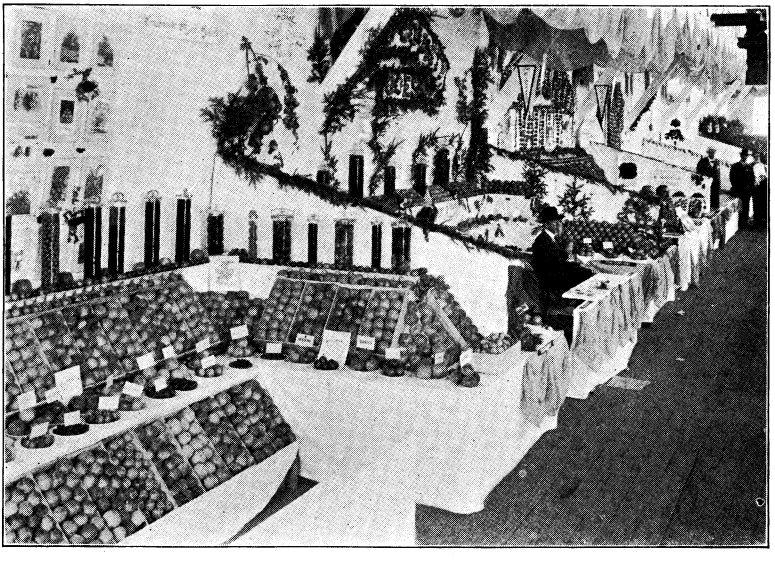


Exhibit State Horticultural Society, State Fair 1913. View from north end.



County Exhibits in Horticultural Building, 1913 State Fair.

These exhibits are all worth while, it is a feature that we can well afford to extend. The exhibitions so far have been largely confined to the state but as the markets for Wisconsin fruit lie almost wholly outside of the state and as our extensive commercial orchards come ino bearing we should overlook no opportunity to show people of other states that excellent fruit is "Grown in Wisconsin".

Our experience in legislative matters may be briefly told. Our bill reducing the weight of a bushel of apples from 50 to 44 lbs. like poor dog Tray found bad company being merged in another measure containing several absurd provisions regulating weights and measures. This measure failed, leaving the apple bushel at 50 pounds.

We were equally unsuccessful in our efforts to secure compensation to owners of orchards trees for damage done by deer.

The plum which the appropriation committee handed us in the form of an additional appropriation of one thousand dollars was changed to a "lemon" by the Curative Act which charges to the appropriation of each department the cost of its annual report and other publications. This innocent appearing little provision really reduced our former appropriation about one hundred dollars.

Eight local societies are now affiliated with the state society viz., Bayfield, Lake Geneva, Madison, Manitowoc, Oshkosh, Poysippi, Sheboygan, Washburn and Chippewa Valley, the last named a newcomer organized February 1913 with headquarters at Eau Claire.

While all of these are more or less active the Oshkosh society which holds monthly meetings in summer for observation and consultation and in winter for discussion and entertainment seems most nearly to fulfill the objects and purposes of a local horticultural society.

The three large and active coöperative selling associations, Bayfield, Sparta and Sturgeon Bay are each yearly increasing their volume of business and are now to be considered as permanent factors in the fruit situation in Wisconsin.

Two smaller and newer but active associations one at Washburn and one at Alma Center are promising.

The magazine WISCONSIN HORTICULTURE three years old last September, seems to be filling a useful place. Financially it is now well able to take care of itself having a balance to its credit of over $500.00.

This covers briefly and imperfectly the work of the society for the year 1913. All of our work tends to the uplift of horticulture in the state. With the rapid development of fruit growing in the state this society will find an ever increasing field of usefulness.

LOOKING BACKWARD.

The year 1913 marks no important epoch in the history of the Society, the milestone we have just reached, the 48th in the history of the Society is not marked to the members differently from many

others but to your Secretary it is an important date for to me it marks the closing of a decade.

Ten years ago I cast my lot with you and for ten years I have held your interests to be as my own. You will then, I am sure, grant me a few minutes for a review of the things done, not by me, but by the society in that period; its growth, its accomplishments and its standing in the community.

Ten years ago the Society, then 39 years of age, had 111 members, three trial orchards and an annual appropriation of $4,000.00.

We have to-day over 1800 paid members, eleven trial stations and an annual appropriation of $9.000.00. These three points while somewhat imposing are only the "outward and visible" evidence of our growth and work.

Ten years ago there was no bearing orchard of over fifty acres in the state. We have now hundreds of orchards of 50 to 100 acres each.

Ten years ago it is safe to say that the acreage devoted to fruit of all kinds was not over 2,000. To-day we boast of 4,000 acres of tree fruits in one county and a total of 20,000 acres planted to apples, plums and cherries, exclusive of farm and home orchards.

Ten years ago it is likely that all of the spray pumps and spray rigs in Wisconsin could have been loaded on a one-horse wagon with room left for all the fruit picking and packing implements. Spray rigs are now as common and as much used as corn planters were ten years ago and the fruit grower who does not spray is a curiosity.

Orchard cultivation and cover crops known to only a few ten years ago are now universal.

Ten years ago Wisconsin was not recognized as a fruit state while now we are decidedly and distinctly "on the map". Ten years ago the Oregon and Washington apple orchard boomer flourished in the land and any hint or suggestion that money and time might be profitably invested in fruit growing in Wisconsin was considered a huge joke. Now we have several flourishing orchard companies financed by Wisconsin people.

Ten years ago we had but one coöperative fruit selling organization in the state while now we have three with an aggregate annual business of over a quarter of a million dollars.

It would of course be going much too far to say that all of this development is due to this Society but no one will dispute that it is very largely due to our work. When we say that the development of commercial fruit growing in Wisconsin is due in a large measure to the activities and energy of the Horticultural Society we do not thereby intend to disparage in any measure the work of the horticultural department of the Agricultural College nor will any thinking person so construe it. It is not the field of the College to directly promote the planting of orchards and to enter the field of publicity setting forth the advantages of our state or any part of it for fruit

growing; to urge our people to plant orchards nor to induce people from other states to come to Wisconsin to engage in fruit growing. It has a higher mission to perform, a bigger and broader field, that of experimentation and education and it is left for us to begin where the College leaves off.

In other ways the Society has advanced in ten years. From being practically homeless we now occupy comfortable and roomy offices, housing the best horticultural library in the state. We use this office as a central bureau of information for the use of any resident of this or any other state.

For five years of this ten-year period, from 1905 to 1910 we issued bulletins, 19 in all, fashioned after those of experiment stations. While these fulfilled a purpose and were fairly well received the demand for copies outside of the membership was so limited that it was decided to suspend publication.

In place of these in 1910 the Executive Committee authorized the publication of a monthly magazine the first of its kind. At first an experiment it is now so well established that any suggestion looking to its suspension would be met with loud protest.

In many other minor but material ways we have advanced the interests of horticulture in the state, home grounds, school grounds and farm institute work.

We have forced recognition of fruit growing as a commercial proposition from the Farm Institute management and the Agricultural College; we have preached the gospel of the home, of shrubs, trees, vines and flowers as never preached before in this state.

We have in brief lived up to our obligations and to the preamble of the Charter granted to us by the State of Wisconsin in 1879, "the advancement of the art and science of horticulture throughout the state." We have been able to accomplish this because we have all worked together faithfully and heartily for a common cause.

LOOKING AHEAD.

While retrospection is an agreeable diversion it can be of value only if used as a foundation on which to build for the future and at this time we may profitably look ahead ten years.

Ten years hence, 1924, we may reasonably expect to have for the society:

Five thousand members.

An annual appropriation of $20,000.

A weekly magazine.

Two "field" men constantly employed, in trial orchard inspection, packing demonstrations and similar work in the growing season and in horticultural institute work in winter.

In the fruit industry of Wisconsin:

One hundred thousand acres of fruit with an annual output of

twenty million dollars, the third industry in importance in the state with dairying and stock raising only outranking us.

Coöperative marketing extended to reach every grower in the state:

A buying and selling organization in each fruit producing community, these affiliating with a state wide association which in turn forms a part of an upper Mississippi valley Exchange.

On every farm a home orchard but no "farm" orchards.

On every farm a garden both for flowers as well as vegetables.

All of this and much more than ten times all this may come to pass if we work unitedly. Our field is to execute such tasks as lie in our power and then to initiate others, to propose, to suggest and to see that they are accomplished some way or somehow.

To accomplish these ends two things are needed, funds and loyal coöperation. If we furnish the second the first will come without effort.

Abstract of Reports from Local Societies for 1913.

Name of Society.	Number of members.	Membership fee.	Number of meetings during year.	Number of exhibitions.	Character of exhibits.
Bayfield Peninsula Horticultural Society	148	.50	4	1	Fruit and vegetables.
Madison Horticultural Society	30	$1.00	4	.....	.....
Manitowoc County Horticultural Society	65	.50	2	1	Fruit, flowers and vegetables.
Oshkosh Horticultural Society	20	1.00	12	1	Flowers and vegetables.
Poysippi Horticultural Society	26	.25	4	1	Fruit, flowers and vegetables.
Washburn Horticultural Society	28	1.00	6	.....	.....
Chippewa Valley Horticultural Society	17	.50	6	.....	.....
Lake Geneva Gardeners and Foremen's Association	31	2.00	28	5	Flowers.
Sheboygan County Horticultural Society	12	.50	1	.....	.....

REMARKS BY SECRETARIES OF LOCAL SOCIETIES.

Secretary FLANDERS of Bayfield Society.

"The Society has expended for civic betterment $83.00; for state and county fair exhibits in coöperation with county committee $50.00 and for expenses connected with meetings of the society about $15.00."

Secretary MESINEST of Manitowoc Society.

"Much has been done along the line of improved horticulture the past few years through our society."

Secretary PETER FISHER of Oshkosh Society.

"The Oshkosh Horticultural Society holds its meeting the first Monday in each month; during the summer months we hold them at

the homes of the members where after inspecting the gardens we have a picnic supper and a short program, papers, music and discussion. During the winter months we meet at the hall of The Chamber of Commerce, where we discuss things of interest to our society. To interest children in growing flowers we offered $8.00 in premiums for best display at the county fair of Asters, Phlox, Pansies and Zinnias. We made a successful exhibit at the Summer Meeting of the Wisconsin State Horticultural Society. We have had a very successful year as a society."

Secretary WM. H. GRIFFITHS, of Lake Geneva Gardeners and Foremens Association.—

"The members of the above association wish that the W. S. H. S. would devote one or more sessions to the discussion of matters pertaining to such subjects as Floriculture and Olericulture or such topics as would be of interest to men having charge of private estates."

FINANCIAL REPORT OF SECRETARY

January 1st, 1913, to January 1st, 1914.

	Dr.	Cr.
Received for membership fees, cash	$637.48	
Received for membership fees, stamps	7.12	
Received for advertising	632.49	
Received for fruit	569.20	
Refund State Board of Agriculture	146.20	
Refund Minnesota Horticultural Society	28.90	
Miscellaneous cash receipts	15.10	
Payments to L. G. Kellogg, Treasurer		$1,068 80
Payments to State Treasurer		960 57
Stamps for memberships		7.12
	$2,036.49	$2,036.49

TREASURER'S REPORT.

L. G. KELLOGG, Treasurer,

IN ACCOUNT WITH

THE WISCONSIN STATE HORTICULTURAL SOCIETY.

(July 1st, 1912, to July 1st, 1913.)

	Dr.	Cr.
Received from F. Cranefield, Secretary		
For Membership Fees	$668.75	
For Advertising	610.91	
For Fruit Sales	251.00	
For Refund from Minnesota Horticultural Society	28.90	
For Refund from State Board of Agriculture	146.20	
For Miscellaneous Receipts	12.29	
Received from State Treasurer	7,626.69	
To Balance due Society	157.48	
To Error on Orders No. 695 and No. 707	.52	
To Balance due Treasurer	386.13	
By Vouchers Returned		$9,888.87
	$9,888.87	$9,888.87

L. G. KELLOGG, Treasurer,
IN ACCOUNT WITH
THE WISCONSIN STATE HORTICULTURAL SOCIETY.
(July 1st, 1913, to Aug. 1st, 1913.)

	Dr.	Cr.
Received from F. Cranefield, Secretary		
For Membership Fees	$94.75	
For Advertising	118.30	
Received from State Treasurer	2,049.21	
To Balance due Treasurer	69.75	
By Vouchers Returned		$2,332.01
	$2,332.01	$2,332.01

Office of Secretary,
Madison, January 7th, 1914.

REPORT OF FINANCE COMMITTEE.

Your committee have gone over the books and vouchers of the Secretary and Treasurer and have found same correct.

IRVING C. SMITH,
J. A. HAYS,
L. H. PALMER.

PAPERS AND DISCUSSIONS.

WHY CULTIVATE.

GEO. F. POTTER, Hort. Dep't. Univ. of Wis.

In beginning the discussion of such a subject, it is necessary to outline briefly what we mean by orchard cultivation and what other systems of soil management might be used in the orchard. There are two methods of managing orchard soils in which annual cultivation is a part of the program. The less desirable of these is called the clean culture system, by which the orchard is plowed in the spring as soon as the land is fit to work, that is, it is given a thorough preparation tillage, after which a maintenance tillage is carried on throughout the season using the spring tooth harrow or some similar tool. It is generally considered a better plan to conclude the cultivation about the middle of July or first of August and to sow some rank growing plant. By this means the wood is induced to ripen earlier and the following spring when the crop is turned under the store of organic matter in the soil is increased. This is in brief the well known *clean culture, cover crop* system of orchard soil management. So far as I know only one system, the sod mulch or Hitching's system, has ever been advocated as being equal or superior to the cultivation cover crop method. The essentials of the sod mulch system are that the orchard be sodded, and that all the grass growing be mowed and left upon the ground, more litter being added rather than any being taken away.

It must be distinctly understood that pasturing the orchard or growing of hay in it is not the true sod mulch system, and the advantages of the sod-mulch, if any, cannot be expected if these practices are followed. Either of these practices should be considered as orchard cropping, which although permissible with young orchards previous to bearing, is not to be tolerated among trees which are bearing fruit. I believe that any man who is using his orchard for pasture or growing of crops would do better to cut down two thirds of the trees, take care of the remaining one third properly and use the remaining two thirds of his land for pasture or crops. I feel safe in saying that he would get more fruit, and I believe also, more pasture and crops, than if trees and crops were both spread over the entire area.

As has been said before, however, some authorities have upheld the sod-mulch system as equal or superior to the clean culture cover crop system. Observations of commercial orchards teach us

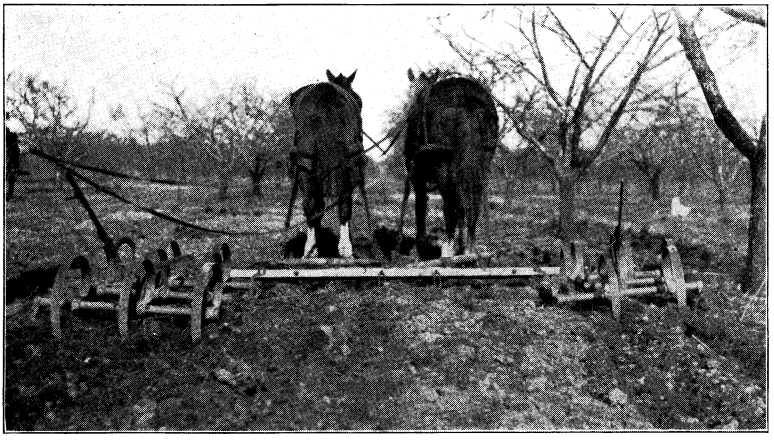
that it is possible to grow good trees by either means, but it is hard to decide just which is the better. The man who believes in sod-mulch keeps his entire orchard in sod, and the man who believes in cultivation cultivates all his trees. But it is not fair to make a comparison unless all other conditions in the two orchards are the same. This is rarely or never the case. Therefore in matters of this sort, I find myself basing my opinions largely upon experimental evidence, where the two systems are tried out side by side in plots carefully selected to be alike in all other respects.

In this case our attention is focused upon two trials, one made at the Ohio Experiment Station, and one at the Geneva Station in New York. But we find these two bits of experimental work leading to astonishingly different conclusions. Messrs. Green and Ballou of Ohio, favor sod-mulch, while Mr. Hedrick of New York, favors cultivation. It is necessary, therefore, to examine somewhat into details.

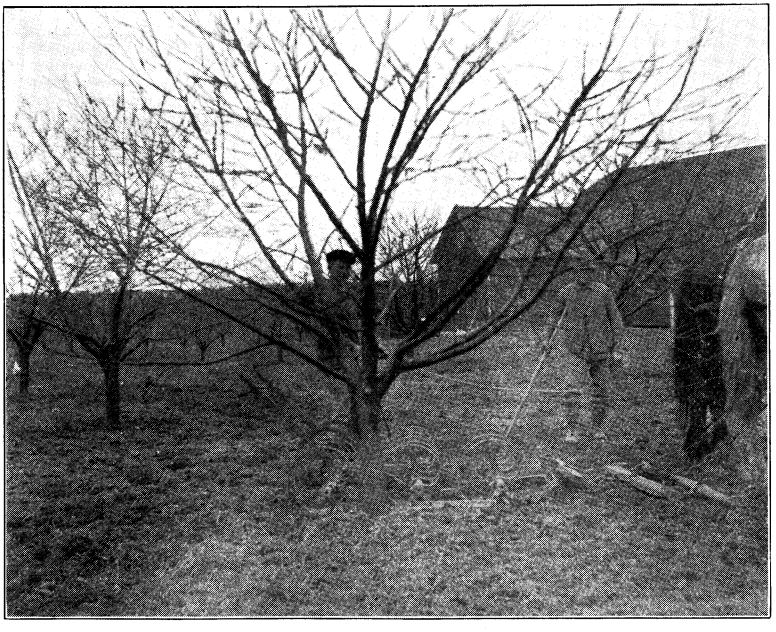
In the Ohio experiment young trees were used. That part of the orchard which was in the sod-mulch system was seeded down and the grass cut as usual, but because the small trees occupied but little space and their root systems extended only a few feet around the points where they were set, the hay from the center of the rows was piled about them. At the end of six or seven years the report was issued, showing that the trees thus mulched were larger and that their trunks had a slightly greater diameter than those grown under the clean-culture cover crop system. The records also showed that there was a larger production upon the trees under a mulch, but as the entire crop amounted to only four bushels this data is scarcely reliable.

If we analyze the situation carefully it becomes evident that the mulch about these trees was much deeper than could be maintained in any orchard in which the roots of the trees occupied all the ground, unless litter from outside sources was available to supplement that which would grow in the orchard. The young trees could not have occupied more than one quarter of the total area, and therefore were receiving about three times as much hay as would grow beneath them. To maintain as deep a mulch as this on a bearing orchard of any size does not seem to me to be a practical plan, without further assurance that the crops will be increased largely by so doing.

I know of no other published report of an experiment in which trees were kept under a deep mulch as in this case, but I am told by Prof. Howard, that in an experiment carried on at the Nebraska Station trees under the deep mulch and under clean-culture cover crop were practically alike in size and health. Mr. Hepler also tells me that Prof. Stewart of Pennsylvania, in similar experiments found larger growth on young trees under deep mulch than in cultivated plots. These agree with the Ohio results, but the impracticability of maintaining such a mulch leads us to ask what results would be



The long evener idea as applied to spring tooth harrow in orchard cultivation at Sturgeon Bay. Orchard of W. J. Lawrence.



Spring-tooth harrow, universally used in Door Co. cherry orchards. Note that the harrow cuts close to the trees. "The man with the hoe", Mr. Ben Otis, was able to "hoe" this 8 acre orchard doing all the hand work necessary and keep up with the team.

obtained by simply mowing the grass which will grow on the ground, without adding extra litter either from outside sources or other parts of the same field. So far as I am aware no such experiment has been carried on in this country, but in the third report of the Woburn Fruit Farm in England, we find a case in which trees under cultivation were compared to trees in living sod. Those under cultivation grew four or five times as fast as those sodded. This, however, is hardly a mulch system because the grass was not mowed, and for this reason too much weight should not be placed upon these results.

In the New York experiment a ten acre orchard of bearing Baldwin trees was used. In the sod plot since all the ground needed mulch, Mr. Hedrick cut the grass which grew and allowed it to rot where it fell, but did not attempt to maintain a deep mulch by adding other litter. In the course of the work he harvested about four thousand barrels of fruit, a quantity large enough to make his data thoroughly reliable. In brief the results were as follows: The average annual production for the period of five years was 109 bushels per acre on the clean culture cover crop plot, and 72.9 bushels on the sod plot. The cost per acre of maintenance was slightly greater for the cultivated plot being a little less than $25.00 as compared to a little over $18.00 on the sodded area. The total net profits of the cultivated plot, however, were $110.00 per acre as compared to $70.00 where the trees were in sod. The apples from the cultivated orchard were larger, weighing on the average about 7 ounces as compared to 5 ounces on the sod plot. The sod grown fruit was higher in color, but not so high in quality nor did it keep as well as that from the cultivated orchard. In general the trees of the cultivated plot gave evidence of greater health as judged by growth, foliage color, and and other appearances.

To briefly review this evidence, then, we find that where trees are maintained under deep mulch the growth is satisfactory, being equal to or possibly sometimes slightly better than under cultivation, but that the maintenance of such a mulch is hardly practical at least upon a large scale. Living sod around trees has resulted in injury wherever tried, and when we simply cut what grass grows upon the ground, crops are not nearly so large and health of trees is not so good as where cultivation with cover crops is used.

The latter is the more important conclusion. Why is it true? Perhaps the most important reason is in the difference in the moisture content of the soil. Let me say emphatically that no other system of soil management will conserve so large a proportion of the water in the soil as does cultivation. Prof. Hedrick in his experiment made about 120 different moisture tests, comparing the amount of water in the soil under sod mulch and under cultivation. On the average about one-third more water was found in the cultivated soil, than in that under sod. One-third more may not seem like a great deal, but a plant is not able to extract from the earth all the water it contains and the soil having one-third more *total* moisture may be

so much farther from the limit that it will have two or three times as much *water available to the trees.* This data compares cultivated with sodded soil. It may be well to add that while a deep mulch holds more moisture than sod, it is not so efficient as cultivation. The Ohio investigators have submitted data showing that under a deep mulch trees have a more extensive root system than under cultivation, and they have drawn the conclusion that this indicates greater activity and health in the tree. The point may well be questioned and the view taken that it indicates instead, that the tree is not receiving enough moisture and is developing an abnormal root system to supply the deficiency.

The second point to be considered is that of plant food supply. When the orchard is in sod the roots of the trees and of the grass must both be striving for the same food at the same time.. We recognize the fact that if the grass be cut and allowed to rot that any food it may take up is returned to the soil, but as the grass roots are still there striving to take it up again, there probably is more or less competition. What is more important in relation to the food supply of the tree, however, is that the aeration, and, as has been proven by investigations of bacteriologists, the bacterial action is so restricted in sodded soils that the stores of insoluble food in the soil are very slowly released for the use of the plants growing upon it. Chiefly because of this latter fact, the food supply of a tree in a sodded orchard is very much less than in cultivated soils, a fact which is probably very important in its effect upon results obtained in such an experiment as that carried on by Prof. Hedrick. Under a deep mulch, however, conditions are better and the supply of food, particularly of nitrogen, is increased by the decaying litter.

It is also thought, although it is difficult to prove, that the roots of living grass have a poisonous effect upon fruit trees. This opinion has been advanced by both Prof. Hedrick and the Woburn experimenters. It is based upon observations of the action of roots of trees in sod plots growing out from the sod under stone fences or into cultivated fields, escaping from the sod wherever possible. Experiments at the Woburn farm also bear out the assumption. It is thought either to be a poison directly secreted by the grass roots or to be a secondary product of the action of sod upon the bacteria of the soil. It is altogether possible that this may be a factor influencing results obtained under the sod mulch system.

In conclusion I will say that as you have already gathered from my discourse, in an orchard of my own I would use a clean culture cover crop system, and that the only condition under which I would seriously entertain the thought of using any other system of orchard soil management would be that my orchard was on such steep land that cultivation would result in washing and carrying away of a large amount of soil.

THE ELEMENTS OF SPRAYING FOR INSECTS.

PROF. J. G. SANDERS, Madison, Wis.

Spraying has been aptly and justly termed "crop insurance". The annual premiums of this type of insurance are indeed very low in comparison with the annual returns, and under this form of insurance all kinds of policies are available to the agriculturist. So great are the benefits returned by careful and conscientious spraying as demonstrated in innumerable cases and under all conditions, that we wonder why all of our horticultural friends do not immediately attempt to secure the benefits derived from this comparatively ample procedure.

The problem before the horticulturist of the control of the ever increasing pests seeking to combat the grower's success, will be an ever present one and is sure to be a continuous performance. On account of this fact it will be well for all of us engaged in horticulture or intending to engage in horticulture in any branch whatsoever, to make the acquaintance of the spray pump and its accessories, and learn all its good points. It has been definitely proven that real success in horticulture can only be obtained by following out the methods of pest control which are pretty well known at this time. These methods of control, although apparently numerous when studied and considered carefully, resolve themselves finally into a comparatively simple treatment. If you would be successful, you must understand and put into practice these simpler practices of spraying or other modern treatment. In the language of a very well known advertisement, "Eventually, Why Not Now?"

The spraying in early days was carried out with a frequent lack of knowledge of the causative organisms producing diseases and injuries, but by the gradual evolution and accumulation of knowledge through modern scientific research and experimentation, solutions of many of our troubles have been evolved and we can now prescribe treatments which will bring about more or less perfect control of pests if instructions are carried out carefully.

In any type of spraying, among the first problems to be determined are those answers to the questions, Why? When? and How? The effect of treatment on the pest and the effect on the plant host are factors to be determined. Lying between these two extremes is an intermediate ground on which all spraying operations are based. To further explain this treatment, I may state that there is an intermediate position between the point of injury to the host plant and the killing point of an insect brought about by a treatment with chemicals which must always be considered in the spraying. The result always aimed at is to get the highest efficiency in the spray for controlling the pest without injuring the host plant.

It will be impossible in the short time allotted me to discuss at length the many phases of spraying, but a few statements relative to the materials used in spraying will be given.

Successful methods for the control of insect pests are based on the knowledge of at least two fundamental factors,—the feeding habits and the life history of the insect pest, with the former as probably more important. Two great classes may be defined under insect control methods, namely, *preventive* and *remedial.* Under the former method, namely, the preventive, are included many of the common farm practices generally carried on with reference to insect control such as rotation of crops, fall plowing and clean cultivation. For the control of horticultural pests the remedial methods are more common and satisfactory in most cases, which include the direct application of killing poisons or the employment of mechanical means of control.

INSECTICIDES AND THEIR APPLICATION.

As previously stated the feeding habit of an insect must be determined positively before applying proper treatment for its control. Success or failure depends on an accurate knowledge of this habit and also on the choice of a suitable insecticide to be applied at the proper time. Generally speaking, these factors are fundamental and most important.

For our purpose we can divide the insect class into two great groups with reference to feeding habits and controls as follows:—

Chewing Insects. Those insects with biting mouth parts that partially masticate the food before swallowing it. In this class are placed all of the caterpillars and chewing larval or worm-like stages of many well known insects. The remedies for this group of chewing insects consists generally of stomach poisons, which are usually some form of arsenicals.

Sucking Insects. This group includes those insects which derive their foods from plants by sucking the juices through a tubular beak or proboscis and have no biting and chewing mouth parts. Controls for this group must consist of material which kill by contact with the insect's body, since it is manifestly impossible to feed arsenical poison to insects which obtain their food from the deeper tissues of the plant. Variations of the above classification occur but for general purposes these groups are quite sharply distinguished.

Arsenical Poisons. Only a few of the many arsenical poisons are discussed here but any or all of them must be used intelligently and according to directions to secure the best results. These insecticides may be compounded at home but more uniform mixtures may generally be purchased in commercial form at little or no advance over the price of the ingredients for home manufacture. Since the passage by our state legislature in 1911 of a bill prepared by the writer requiring certain standards of purity of insecticides manufactured or offered for sale in Wisconsin, satisfactory results should be obtained with our standard commercial insecticides. There are on the market,

however, many proprietary remedies, particularly powders, sold at high prices under fancy names which are made up largely of cheap fillers and carriers, such as plaster of paris, (gypsum) lime, ashes, etc. It is far better to purchase the pure powder poison and supply the filler or carrier as needed.

Orsenate of Lead. This chemical combination or arsenic and lead has proved to be the most satisfactory arsenical poison yet produced, and has several advantages over the better known Paris green which it is rapidly replacing. It is prepared either in liquid or powdered form, the powdered form being preferably for general use since it does not deteriorate on standing. Arsenate of lead is white and shows plainly where sprayed. It remains in suspension much longer and adheres to the foilage for a longer period than Paris green and is the least caustic of the arsenites in its effect on foilage. Powdered arsenate of lead can be applied to plants without mixing it in water. For general spraying purposes 2 to 3 pounds of arsenate of lead paste or half of this weight of the powdered form is well mixed in 50 gallons of water.

Paris Green. This much more widely used insecticide is a satisfactory poison but is not so desirable as the arsenate of lead, since it washes off the plants more readily during rainy seasons and is more liable to burn the foliage unless it is used in combination with lime water. One pound of Paris green in 100 gallons of water to which has been added the milk of lime, made by slacking about 2 pounds of dry lime, has proved a throughly practicable insecticide. For general orchard spraying the two arsenical poisons mentioned above are satisfactory for the control of biting and chewing insects.

CONTACT POISONS FOR SUCKING INSECTS.

Under this heading we include such insects as plant lice or aphis and scale insects which secure their food by sucking the sap from the tree or plant. As previously stated, for the control of this type of pest a contact spray of an oily or corrosive nature must be used.

Kerosene Emulsion.—One of the commonest and most widely used sprays for plant lice and scale insects is kerosene emulsion, used in summer at a strength of 8 to 12 per cent of oil, and in winter from 15 to 20 per cent of oil on dormant trees. The stock solution of kerosene emulsion is made as follows: Dissolve half a pound of hard soap in one gallon of boiling rain water. To this mixture add two gallons of kerosene, first removing it from the fire and churn or pump this material back upon itself violently for five or ten minutes, until a creamy, white emulsion is secured which on cooling should have the consistency of thick, sour milk. When properly and thoroughly prepared, no separation of the oil and water should occur even after periods of several months. The above preparation is a stock solution which must be diluted before used as a spray.

For 8% emulsion add to each gallon of stock			7 gals. water
10%	"	"	5½ " "
12%	"	"	4½ " "
15%	"	"	3½ " "
20%	"	"	2½ " "
25%	"	"	1½ " "

Tobacco Decoction. Another very effectual and safe spray for the control of plant lice particularly, is tobacco decoction or nicotine solutions. These can be purchased in commercial form at a reasonable price and can also be made at home very satisfactorily. Steep (not boil) 1 pound of tobacco stems in 2 or 3 gallons of water for 2 or 3 hours and strain off the dark liquid which can be used as a spray material. If desirable, this liquid can be mixed with a strong soap suds, thereby making it still more effective. For the control of green and black "aphis" on trees, shrubs or garden or household plants, the tobacco decoction is the most satisfactory insecticide available, since there is practically no danger to the tenderest plants.

I shall not atempt to give you the various formulas or control methods for the different insect pests and fungous diseases of our fruit trees. These can be secured by consulting the Experiment Station Bulletins where the material appears in printed form. My desire in this paper has been to call your attention to some of the fundamental features of spraying, particularly with reference to the application of the proper insecticide for the different types of insects. But above all, I want to encourage our horticulturists to a more through study and comprehension of the necessity of proper treatment of pests so that our fruit crops may be not only enlarged but may be of much higher quality, freer from injuries of insect pests and fungous diseases, thereby resulting in a much higher price obtainable in our markets. I hope the time will come when the "GROWN IN WISCONSIN" label will be a widely recognized trade mark, certifying clean fruit of high quality which will demand an unusual market price. I am also desirous of seeing the arrival of the day when every child will have the privilege of eating an apple every times its father consumes a cigar.

DISCUSSION.

Question: What time would you commence to spray in the spring?

Professor Sanders: The spring, at least in this latitude, is probably the best time in the year to do our general orchard spraying. The best results are obtainable with the lime-sulphur solution just at the time of the swelling of the buds on the trees. In using a lime-sulphur spray, we not only kill many of the sucking insects, such as the scale insects and plant lice, but we also control some of the fungous diseases of the tree. In other words, the lime-sulphur is what we have known as a combination spray.

Question: What quantity of lime-sulphur do you use with 50 gallons of water?

Professor Sanders: The dormant spray of lime-sulphur is generally a mixture of one part of commercial solution to nine or ten parts of water. In other words, about a ten per cent solution is a dormant spray. You could not use that strength after the leaves appear on

the trees, since about one to thirty is the proper strength of lime-sulphur to use in the summer.

Question: To which do you give the preference, powdered or paste arsenate of lead?

Professor Sanders: Other things being equal, I think the powdered arsenate of lead is desirable under general spraying conditions, because it does not deteriorate on drying out of the water and we do not want to pay freight on water from points of manufacture.

Question: Do you use the Corona brand?

Professor Sanders: The Corona brand is one of the good, safe brands that are manufactured and works all right.

Question: In using Bordeaux mixture, would you advise the buying of the commercially prepared paste or powdered form, and does it lose its strength by standing any time?

Professor Sanders: Bordeaux mixture is best made at home under proper conditions. No prepared commercial Bordeaux mixture that I know of, is as good as Bordeaux properly made at home; but it should be properly made, according to the directions in the bulletins that are available.

Question: If you are only going to spray with lime-sulphur once a year in an orchard, which would be more beneficial, spraying late in the fall or early in the spring?

Professor Sanders: The best time to spray an orchard, if you are intending to spray but once with lime-sulphur, is when the buds swell in the spring.

Question: Will one to eleven lime-sulphur kill oyster shell scale?

Professor Sanders: One to 9 or 10 per cent solution will kill oyster shell scale if put on just as late in the spring as you dare to apply it.

Question: Will that standard stock solution of lime-sulphur be deteriorated at all by freezing, if exposed to freezing weather?

Professor Sanders: It is far more advisable to prevent freezing of lime-sulphur, in fact any of the insecticides which contain water.

Question: In applying lime-sulphur for oyster shell scale at this time of the year, would it make it sticky in the spring, if you put it on now?

Professor Sanders: The application of lime-sulphur at this time of year would hardly be advisable, although it might be applied under present weather conditions, but the point in applying the lime-sulphur late in the spring, as late as possible, is that the oyster-shell scale at that time is not perhaps as closely attached to the tree as it would be earlier in the year, and the eggs are probably easier to klll at that time, at least best results have been obtained by late spring spraying.

Question: Do you find that you obtain a little more prompt action at times by using a little Paris green with arsenate of lead? It seems to me that Paris green acts a litle more promptly.

Professor Sanders: The Paris green, we find, is a rather superior spray among arsenical sprays; for potato insects, it acts a little more promptly, and if it is mixed with the proper amount of lime it does better work on potato insects, but outside of potato spraying I know of no spraying in which Paris green is superior to arsenate of lead.

Question: I do not mean using it entirely, but I mean using a small portion, perhaps ten to fifteen per cent for Paris green to get a little prompter action, depending mainly on the arsenate. Have you used this combination?

Professor Sanders: I have never used those two in combination as yet. It might be advisable, but a high quality of arsenate of lead applied in sufficient strength will do all the work of Paris green with the exception of the potato crop.

Question: Have you ever tried the powdered form of lime-sulphur?

Professor Sanders: That is what is known as the soluble lime-sulphur. I have tried it; there may be some advantages in it, but I can hardly recommend it over the liquid commercial forms which we have. But you must remember that there is a tremendous variation in lime-sulphur. If you test it out with the hydrometer, there is a great variation; and it should be of a high quality to get the best results. If it is a low quality lime-sulphur, a larger quantity is needed for the application.

Question: What should the lime-sulphur test?

Professor Sanders: Well, that is pretty hard to say. It depends a great deal on the brand. I would hardly want to set any specific limit on account of the number of companies that are placing it on the market. We generally, in public State work, are rather loath to make a particular recommendation of any one type of arsenate of lead or any insecticide, or even spray pump. We prefer to give a list of three or four and let people make their own selection.

Question: Do you think it important that each man spraying should have a hydrometer and test the spray himself?

Professor Sanders: I think it is advisable to have a hydrometer. They cost only a dollar and it is certainly advisable to have one and make your own tests.

Question: Make a minimum limit as to the tests?

Professor Sanders: Make a test of what you have and you will find in almost all experiment station bulletins a list showing the proper solution for the different Beaume tests.

Question: What about lime-sulphur for scale in the summer?

Professor Sanders. You would not dare use lime-sulphur sufficiently strong to obtain the best results in the summer.

Question: Is not there a time in spring when the oystershell scales are alive?

Professor Sanders: Late in the spring you will find some young larvae of the oyster shell scale running about over the tree, and in that stage you can kill them with the summer strength of lime-sulphur. That is the only time.

The president: Will you tell us at what time of year to spray to kill the second brood of codling moth?

Professor Sanders: I would be very glad indeed to know as to what time we should spray for the second brood of codling moth. If the College of Agriculture ever gives me sufficient money to put some men in the field and determine that date after sufficient comparison and study, we can probably determine that time in different parts

of the State. It is a problem that should be worked out just as soon as possible. You can determine it for yourself by taking some of the first June drop of apples, laying them on the ground if you wish, under your trees, and erecting some kind of small breeding cage over the apples; make it of ordinary window screening, so that when the moths hatch out from the apples which you have in this little breeding cage, you would know the proper time to spray to prevent the infestation of the second brood. As yet I cannot give you specific dates for different parts of the State.

Question: Will not that vary?

Professor Sanders: It will vary somewhat in different years, probably within a week or ten days, but not very much more. But there will be a great variation between the southern part of the State, Madison or Milwaukee, and the northern districts, like the Wausau, Bayfield and Door county districts, probably a variation of two or three or four weeks.

Question: Has that date been determined for Madison and vicinty?

Professor Sanders: With fair accuracy we have it here.

Question: Would you be willing to state the limits?

Professor Sanders: It generally runs from about the 20th of July to the 5th of August for Madison. But I have not had an opportunity to work anywhere else.

Question: Will a ten per cent lime-sulphur kill the aphis in the summer time?

Professor Sanders: Not satisfactorily. Kerosene emulsion or tobacco decoctions are best for the aphis. There is no danger of injuring your trees, especially with the tobacco decoction.

Question: Is it necessary to spray as many as four times in order to catch the second brood of codling moth?

Professor Sanders: Not necessarily, if you know within a week or so what is the proper time, one spraying with arsenate of lead would be sufficient.

Question: And you spray three times?

Professor Sanders: Yes, we spray just when the petals fall and then again ten or twelve days later for the first brood, then the third spraying ought to come in time for the second brood, as it appears late in July, or up to the 5th of August.

WEDNESDAY AFTERNOON SESSION. HORTICULTURAL BUILDING, UNIVERSITY OF WISCONSIN, MADISON.

PRUNING PRINCIPLES.

PROF. J. G. MOORE, University of Wisconsin.

The principles upon which pruning is based are the forerunners of the practice of pruning, if we are to prune intelligently. Now, I realize that it is possible for a man to go out and prune a tree, or at least go through the operation that he calls pruning and which possibly we might term pruning, without knowing anything whatsoever about the principles upon which pruning is based. But I contend that if he does, he is not doing intelligent pruning.

At the very outset we must get clearly in mind the difference between the principles of pruning and the objects of pruning. We prune to get certain definite results. Whatever those definite results are would be the object, but in order to secure that object we must follow certain definite facts or rules of plant growth, or we are likely to fail in securing that object. These facts or rules are the principles upon which pruning is based.

There are two schools on the subject of pruning which hold very different ideas. I think it safe to say that the schools are at the present time quite unequally divided. We still have what we might term the old school as regards pruning, which held that little or no pruning was necessary in the orchard, on the ground, nature would take care of that proposition herself, and I regret to say that we still have some horticulturists who hold to that theory. I believe however, that the majority of horticulturists have come to recognize that if we want to produce fruit, at least a marketable kind of fruit, we cannot depend upon nature to take care of the trees, not only as regards planting and cultivation, but equally as regards pruning. So that if we are to go into orcharding from a commercial standpoint, or, for that matter, from the standpoint of the home orchard, and are to carry on the operation successfully, any rational system of culture will have to include the practice of pruning.

One of the very first principles, and I think possibly one which we might say is really as important, if not more important than any of the others, is that heavy top pruning, or to put it in other words, the removal of a relatively large amount of the top of the tree, tends towards increase of vegetative, or top growth. That is the first principle which a pruner should get in mind, for if he fails to have that in mind, he is very likely to cause more injurious results than good by his operation.

Now, in order to study this more throughly, we should go into the why and wherefore of this practice. Why is it that if we remove a

large part of the top of a plant, we will increase the vegetative growth? In nature, as the plant grows, there is kept a sort of equilibrium between the tops and the roots. There is a sufficient amount of nutrition under ordinary conditions to supply a given amount of top, and to produce a certain amount of wood growth. If we destroy that equilibrium between root and top, by removing a large amount of the top, we have a preponderance of the food gathering area of the tree over that portion which would naturally be consuming the food, with the result that there will be forced out vigorous new buds, possibly buds which have been latent for some time, which had not developed at the time they ought to, or the development of new buds which had not been present previously. We get the tree putting out a much more vigorous growth after the top has been removed or seriously cut back, than we would if the tree had been left in its normal condition. That brings up immediately the application of this principle in actual practice. How does this principle influence the procedure of a person who is to prune a tree? In the first place, we may resort to this method of top pruning to invigorate a tree. A tree which has been making a slow growth, possibly seeming to be deficient in its root development, possibly one which has been injured, one which has not been making a desirable top development, will be pruned rather severely. We will remove a relatively greater amount of wood than we would from a tree of the same kind which was a vigorous tree, because, getting back to our principle, the removal of a large proportion of the top will tend toward an increased vegetative production. That, then, will be the first practical application.

The next way in which this principle may affect pruning is as regards the question, How frequently shall we prune? Fruit bearing is associated with what we term in horticultural language, a quiescent state, or possibly we might say a semidormant state—although that is not a good term to use in this connection. That is, a state in the tree when there is not being produced a large amount of vegetative growth. We have come to learn in the production of fruit, that a tree does not turn its energies strongly in two directions at the same time. If it is putting lots of energy into fruit production, it is not going to produce very much wood. On the other hand, if it is putting most of its energy into the production of wood, and making a large vegetative growth, it is not going to produce very much fruit. How then does this principle of pruning affect the plant? Simply in this way,—that if you have, as many orchardists have done in the past, and as 95 per cent who have been growing orchards have done, delayed pruning this spring, because you are a little rushed with your farm work and wait until the third or fourth year, and then try to make up for lost time and take off all the wood you should have taken off during the three or four years, you will have given your tree a very heavy top pruning, and the result will be that, that tree, due to this unbalanced equilibrium between the root and the top, is going to turn its attention and energy towards an increased top growth. Now, if the statement which I have made that fruit grow-

ing is associated with the condition in which there is relatively only a small amount of top growth, then we are reducing our fruit crop, and not infrequently it does result in arresting fruit production entirely for a considerable length of time, so that the practice of annual pruning is based, for one reason at least, upon this first principle of pruning.

Any of us who are growing trees to any extent have observed that when we have removed a considerable amount of top wood, we forced out new growth upon the larger branches, particularly around the points where we have removed comparatively large branches, possibly a couple of inches in diameter, and upon the trunk of the tree. This new growth starts where it would ordinarily not have started, arising from what we call in botany adventitious buds, which result in water sprouts or suckers. This then is another result that may be caused by heavy top pruning. Now, water sprouts or suckers on a tree that is bearing are a detriment, because as a rule they serve no valuable purpose, and serving no valuable purpose either at the time of production or later on, they are simply monopolizing or consuming an amount of food which should have gone to some other part of the tree. If then, we have pruned a bit vigorously and have brought about this production of water sprouts, we must remember that they are practically, from the standpoint of the tree, parasites and therefore should be removed as soon as possble after their production. These are the three main results of the application of the first principle of pruning.

Now what rules can we deduct from it? To sum this up briefly, Prune weak trees comparatively heavily. I do not mean by that that if you have two trees, one a weak and one a vigorous tree, that you would prune as much wood from the weak tree as from the vigorous one, but you would prune the weak tree proportionately more heavily than the vigorous tree. We also get the rule that for best pruning we should prune at least once a year. I might say that a good many of us believe that that might be extended to cover a greater portion of the year than it usually does. Then we have the third rule which I just gave, the removal of water sprouts as soon after they are produced as possible.

Passing on now from the first principle of pruning to the second, we have the principle which says that root pruning tends to reduce vegetative growth and therefore tends towards fruit production. I always hesitate somewhat about putting forth this principle, because it is so likely to be misunderstood, that is, it is quite likely to be given more real importance in orchard operations than it deserves, because root pruning, if we follow this principle without good judgment, would seem to say that if you want heavy fruit production you should go out and root prune your trees, possibly carry it a little further and say, root-prune your trees annually. But it is not always wise to take a bare statement of fact without considering other factors which might influence the fact, and so with this principle. We cannot take it in its broader sense, because if we study this subject a little more

closely we will find that when we root prune our trees we are not only disturbing the equilibrium, but we are disturbing it in the opposite direction from top pruning with the result that we now have a top which is too large for the root, and if the root pruning has been too severe we will have a top which will not be supplied with the necessary moisture, which will result in a shriveling of the tissues and possibly death. Not only that, but if we continue root pruning indefinitely from year to year it has a weakening effect upon the tree and we soon get our tree to a point where it is no longer able even to produce fruit, because it has been carried past the stage, even the quiescent stage where it gets enough food supply for the formation of flower or fruit buds, so that the adoption of this principle in fruit-growing is a minor one and it applies, I believe I am safe in saying, in only one case, which is, when trees for some reason—the influences might be several—refuse to go into fruit-bearing, but keep on making vegetative growth, then we may possibly root prune them and tend to cause them to produce fruit.

The third principle has to do with the season of pruning, and may be stated something like this: Winter pruning, or, to make that a little more inclusive, pruning during the dormant period of the plant, tends toward increased vegetable growth, or tends towards a heavy top growth, and summer pruning tends towards fruit production. Now here again our principle, if taken too literally, may lead us into difficulties. As fruit production is what we are after, we might think that if summer pruning brings that result we may be justified in pruning our trees in the summer and only in the summer, but here again we have to consider the counter proposition that in summer pruning we are removing from the tree parts which have been produced through the activities of other parts of the tree and which have as yet not paid their board bill. That is, these parts have been produced at the expense of other parts and they have not in turn served their purpose. What is the result then, if we carry on summer pruning continuously and indiscriminately? The same as if we cut off the roots indiscriminately. We have reduced the food supply and we have impaired the vigor of our tree. And if carried on indefinitely, it will mean reduced production, just the same as if we reduced the roots, because you remember, that while we ordinarily think of a tree gathering its food through its root system, the facts are that a tree gathers at least ninety per cent of its food making up its dry weight, not through its roots, but through its leaves, and if we remove those leaves before they have gathered this food there has been just that much drain upon the plant. It is because of this fact that our practice in horticulture, so far as fruit growing is concerned, in relation to the season of pruning, has confined that pruning very largely to the dormant period.

The next principle of pruning which will demand our attention is a statement of fact which probably you all know, that is, that pruning is or may be a fruit-thinning process. The reason I give this principle is because it makes certain demands upon the pruner. It de-

mands that he know more than the bare principle, that pruning is a thining process. It demands that he know something about the plant which he is pruning as regards its method of flower and fruit production. If we go into the orchard or the vineyard and attempt to prune our plants without having first studied the methods of flower production which result in fruit, we are quite likely to carry the thining process beyond the point where we will get proper crops. Very frequently we find a man starting out to prune his apple trees or pear trees who has not made a study of this, or has given it little attention, and because he finds a lot of crooked, unsightly twigs on the larger branches of his trees, he thinks the trees will look very much better if he cuts those all off and every one he cuts off means a portion of his crop, because he is removing fruit spurs, and, when he goes into his American plum orchard and cuts back all of the last year's growth, he is reducing his fruit crop, because he has not learned that on the American plum, near the base of the past season's growth are produced flower buds. He must therefore, if he is to prune intelligently, inform himself on the method of flower production of each of the particular fruits that he is going to prune. He will not prune the grape as he would prune the apple, in the same proportion or in the same manner. He will not prune the raspberry or the gooseberry as he would the grape, and so on. This principle therefore means that if you are to prune intelligently the various kinds of fruit, you must inform yourselves of the method of flower production.

The next principle is that of heading in, by which we mean the heading back of the past season's growth, which has a tendency to thicken and broaden the top of the tree. Those of you who have studied the development of twigs know that along the sides of a branch produced during a given season, are produced buds. If in pruning we leave that branch exactly as it is, without removing any of the branch, we can expect that the following season we will get a long most vigorous growth from the end or terminal bud, and we will get from the top two or three or four buds, depending upon the number of the shoots and the vigor of the tree, comparatively vigorous shoots, and from the buds near the base we will get nothing, or very little. If however, we cut back that growth, which we call heading in or shortening in as it is sometimes termed, we continue the growth which would take place at the tip of the branch down here, nearer the base. (Illustrating).

If we leave all the shoots and cut them back the same, we will get a tree which is so dense that the probability of sunlight getting into the center of the tree is very remote. We will therefore need to reduce the number of shoots. This is important from the standpoint of the color of the fruit, and of prevalence of disease and is influenced largely by the particular kind of fruit and the section in which you are growing it.

Take another principle of pruning. Some of us have come to think possibly that by pruning we can change the habit of the plant. If a

tree naturally has an upright growing habit, as, for instance, taking an extreme type, the Whitney crab, which you all know grows more like a pear than it does like an apple, the branches are as nearly vertical as possible. It does not matter how much we prune that tree. or how we prune it, we will never induce it to change the way it produces its branches, but we can by pruning properly correct this defect and throw the growth, outward, instead of letting it go directly up, or very nearly so, and thus make the top spread out more. We can overcome then to some extent such a defect by pruning, even if we do not change the habit of the plant. We can do this much more successfully with trees which have an upright growing habit than we can with trees which have a growing habit which is more nearly horizontal. With a type of tree such as Talman Sweet or Longfield, we cannot correct the defects to the same extent as with the upright growers. But we must take into consideration in pruning that we can, to some extent at least, overcome the defects in the habit of growth of the tree.

These are the more important principles of pruning. There are some others, but I have already exceeded my time, but I want to say in conclusion that the best pruning is that pruning which results from a definite object, is done after a careful study of the conditions, the climatic conditions in which the tree is growing, and also a study of the peculiarities of the kind of plant we are pruning, apple or plum or pear or what, and also the peculiarity of the particular variety. For we cannot prune all varieties of apples, or should not prune all varieties of apples in exactly the same way. Now, if there are any questions, I shall be glad to answer them. I realize, as I said at the beginning, that I have not given you any definite ways of pruning.

DISCUSSION.

Question: When a tree, either by accident or influence of the wind, leans especially to one side, is it possible by pruning on the side where the growth is defective to induce it to grow more on that side?

Professor Moore: It will have a tendency to do so, that is, if you prune quite heavily there. Of course you have the factor of increased growth getting the additional effect of the wind. In that case, the thing we should do to overcome the effect of the wind is to lean our trees, in planting, into the prevailing winds. I saw just across the line at Menominee, in the orchard of Mr. Nelson, a few years ago, young trees that were planted, possibly not quite at the angle which I have made there, but very nearly. While I had learned at school that when you had such a condition, you should slant your tree, I had never realized that you should slant them anything like Mr. Nelson slanted them. I found out very soon that it was all right, because we drove down the road less than a quarter of a mile where

he had an orchard in bearing, and I saw the results of such planting. His trees, although set at a considerable angle, had after being set possibly fifteen years been curved by the force of the wind, so that the majority of the heads were beyond the center of the trunk.

Question: Is there any advantage in trying to hold them in that way, if they have once become turned in that way?

Professor Moore: I think you can do comparatively little; that is, if your tree is vertical and that growth should run over, you can have a slight tendency to influence it if you prune the branches. Suppose the wind is in this direction (illustrating). We always figure on pruning so that the top bud is out, which will have a tendency to throw this growth more at that angle, more nearly horizontal, with the result that when it does get back up, it will probably not go quite so nearly in line with the trunk.

Mr. Richardson: How will you apply that principle in the tendency of the tree to grow to the northeast?

Professor Moore: The probability there is that the tendency to grow in that direction is largely due to the wind. That is, the tendency of your tree to grow to the northeast is due to the effect of the prevailing wind, you should overcome that by slanting your trees into the southwest.

Question: When do you root prune?

Professor Moore: I want to emphasize at this point, seeing that this question has come up, that we do not advocate root pruning to any extent. It is a special practice and we believe, as a rule, a special practice is likely to result, if followed out indiscriminately, in a detriment rather than a benefit. But if you root prune, root prune in the spring; then you will get your effects, not that season, but the season following. I am speaking now of tree fruits.

Mr. Moyle: Why is it that some varieties of apples in orchards will be full of water sprouts and other trees of other varieties have none, all growing in the same manner?

Professor Moore: For the same reason that your tree has different characteristics in other respects; it is the individuality of different varieties. Even if all other conditions are similar, we know that with two varieties pruned practically the same, one may produce more water sprouts than the other. One produces adventitious buds more readily, or it may be, you have latent buds there which are forced into growth.

Question: With this system of cutting off the top of the tree in order to get a new growth, you could not naturally expect fruit for some time.

Professor Moore: If you cut off all the top, you would not be likely to, because of the increase in wood production. You would have to form a new head to a point where you would get flower bud production.

Question: Have you had any experience in cutting off large limbs in January and December, and what success have you met with?

Professor Moore: I have not, because in the first place I do not

believe in removing large limbs at that time of year, and my reason for it is this. Yes, I heard somebody say "Nor any other time." I will qualify that, however. The reason why we advocate pruning, particularly if we are going to take off limbs of any considerable size, in the spring is this: Supposing we have here a branch from which we are removing another branch. I make that cut in the most approved fashion, whatever that is, I take that off in the fall. Now, the only part of the exposed area between those two points which can produce new growth to heal that wound is a very small layer of cells which lies just between the bark and the wood, which we call the cambium layer. Those cells are in heavy growth during the same period of the year that your tree is making a heavy growth, and if we cut that branch off in the fall or winter, that wound has to stand there in that condition until spring, because there is no growth taking place. If that stands there then during the winter months, with our dry atmospheric conditions and high winds, even though we protect it somewhat, and with the freezing which we always get, you run the possibility of getting this cambium layer, which is exposed and in best condition to lose its moisture, killed back beyond the original wound. You also run the chance of checking this tissue here, because it is not being healed up, and because it is given the most adverse conditions. So for those reasons I do not believe in the practice of removing large branches, if they have to be removed, in the fall of the year. Neither would I let it go too late into the spring, but I would prefer to leave it go a little later in the spring than to do it in the fall.

Question: Why have any branches removed?

Professor Moore: Because we do not practice right pruning at the start. In the average case, with a tree properly pruned during its early development up to the time it bears fruit, there will be no necessity to remove large branches. That is a matter outside the principles of pruning.

SOME PROBLEMS IN ORCHARD PATHOLOGY.

PROF. L. R. JONES.

I am glad of the opportunity to join in extending greetings to you and also in saying a few things about the relation of the work in the department of plant pathology to the interest of your Society. I have on previous occasions gone into certain details regarding the work that we have done or are doing. It seems to me it would be better this afternoon to say just a few things regarding some things that we hope to do. Speaking for your Society, I realize that your chief interests are with the orchard and orchard fruits. We have during the last three years given some rather critical observations to the diseases of orchard fruits, but we have not been able to take up a good careful experimental study or investigation of any of them save the one, the rust disease, upon which we have before reported to you. You will recall that that is the disease which is especially prevalent in certain sections of the Wisconsin river valley and Mississippi river valley, characterized by the development of rusty spots upon the leaves, causing their early death and fall. As I have explained before, this rust comes originally from the fungous infection on red cedars, or red junipers (Juniperus Virginiana) and passes from the cedar to the apple. As has been known to your president and some of the others who have had trouble with it, the ideal way to get rid of it is to cut out the cedars, but in certain sections of the State where these are common as native trees, it is not always practicable to do this. Hence our experiments aimed to decide whether the rust could be controlled by spraying. These have shown that possibly it can be reduced by spraying, perhaps if care enough is taken it can be reduced to a practical degree, but it cannot be eliminated by spraying. In any case, the wise thing to do is to avoid bringing the red juniper into proximity with the orchard if you can do so, or if you cannot, then to realize that there are certain varieties, especially the Wealthy, which are subject to the disease. This is simply repeating testimony that I have given once before to you as to the field studies we made in the orchards of Mr. Palmer and others upon this disease.

Now, as to other diseases,—there are troubles more generally important over the State than rust, because there are only a few sections of the State where the cedar is common. Those other troubles are of three main types. (1) There is the scab of the apple, the most widespread serious trouble on leaves and fruit in apple orchards; (2) there is the shot hole fungus, a serious leaf disease in cherry and plum orchards; and (3) there is the obscure class of troubles with trunk and branches termed canker and blight, which are due to various causes. Mr. Keitt, whom you met last year, has returned from his work upon orchard diseases with the Government and is to give all his attention to this department from now on. It is planned that he

Light gang plow used for first cultivation in cherry orchards at Sturgeon Bay.

"Light Draft" harrow used in Sturgeon Bay Cherry Orchards.

give his chief attention to careful studies of these troubles in orchard and laboratory.

But do not expect too much. We cannot attempt to work out all of these things fundamentally at one time. While we shall aim to work in coöperation with the horticulturist with remedial treatments from the outset, the point I wish to emphasize is that with each of these diseases in turn certain fundamental points as to cause need critical intensive study.

The apple scab is better understood than the others, but it is still a question as to how the scab fungus lives over the winter and starts again in the spring. Six or eight years ago we thought we knew all about this. Then a new and important fact was learned, namely that the apple scab lives through the winter upon the dead leaves under the trees; then spores are produced on those in the early spring, a type of spore different from that produced on the living fruit and leaves in the summer, and probably more virulent, which reinfects the trees. Having learned this, it was again supposed we knew all about the matter and could safely modify our spraying operations to meet these new facts. But now comes new and disturbing evidence from Maine and New York. This is to the effect, that in addition to the overwintering scab fungus on the leaves, they find it living over on the twigs of certain varieties of trees. If this is found to be the case in Wisconsin also, then it may be that we need to return to the use of the dormant sprays which under the other teaching we were inclined to believe of less value. In this way the apple scab question has been opened up again, so that at the national meeting of the plant pathologists last month there was more discussion of these matters than at any time for several years. Some further study needs, therefore, to be given to the apple scab qustion in Wisconsin.

Another matter where more attention is needed, concerns the health of the cherry and plum orchards. The shot hole disease is the worst trouble here. Up to about two years ago it was thought we knew all about the way this fungus overwinters. It was supposed that it developed only the one kind of spore and was distributed by that. But investigations within the last two years in the eastern states have shown that, here again, another kind of spore is produced on the dead leaf tissues upon the ground in early spring. This indicates that it may be necessary so to modify the spraying operations as to prevent this early spring infection. As showing the immediate practical significance of this, those of you who are acquainted with the conditions at Sturgeon Bay know that the results of spraying last spring and summer were not the same as they had been the preceding years. The success of last season's spraying apparently depended more upon one application at a critical time in early spring than upon later applications, whereas in previous years the chief benefit came from later applications. The explanation may be that under the conditions of last spring there was an exceptional amount of infection from the early spring spores, developing upon the dead leaves on the ground. Now, as to whether that is the fact or not, remains to be learned, but

we hope now with the coöperation of the horticultural department and the Sturgeon Bay orchardists to get further light on the matter. It is extremely important practically, that we learn how all these pests pass the winter, because it may be that some little modification of the treatment in the early spring may make more difference than we at present realize in their control. It is quite possible that with the shot hole fungus, as with the brown rot of the plum, sanitation looking toward the destruction of the dead leaves may be important.

Now as to that third group. I have talked to you about certain practical aspects of the the canker and blight questions before. In this connection to-day I wish to emphasize that there are more things that we do not know about the causes of canker of fruit trees in Wisconsin to-day than there are that we do positively know. We know in a general way that fire blight is capable of running down the stem of apple trees and causing canker, but we do not know that the general type of crotch canker in Wisconsin is caused by fire blight. Nor indeed has it been demonstrated to be caused by fire blight in any case known to me. I do not say that it may not be so started in some cases; I simply say that we do not know. Investigation is needed. Another type of canker called crown rot occurs at the base of fruit trees. Even in the east where fruit trees have been grown and watched a century and more the experts are not agreed as to the cause of this type of trouble. In some cases it has been attributed to climatic injury, in others to the fire blight bacteria. What does this mean? Is one expert right, the other wholly wrong? Not necessarily. If the tissues are killed at the base or in a crotch in a tree it causes what is called a canker spot. In the end one canker spot may look like another, but the cause of killing in one case may be entirely different from that of the other. What we need here in Wisconsin is to find the cause of the cankers as they occur in our fruit trees. There is also the more familiar "sun scald" type of canker upon limbs and trunks. There can be no doubt that climatic conditions play an important part in these various cankers in Wisconsin, or that, following those climatic injuries, fungus and bacteri may get in and increase injuries. The bacterial or fungous parasites may also work quite independently. Here again patient, skillful investigation is needed, for the understanding of the causes must guide remedial measures.

Some two years ago complaints began to come to us about the so-called "leaf curl" trouble with cherries. Opportunity came this last summer to go over some affected orchards quite carefully examining roots as well as tops. The trouble shows as a general debility of the tree. The tree stops growth, so that in some instances trees that have been showing this trouble for two or three years have made very little growth during that time, although remaining alive, while neighboring trees have doubled in size. Meanwhile the affected trees have shown each year a progressive paling and upcurling of the leaves, with premature defoliation. In bad cases the tree weakens more rapidly and dies out after a year or two. These examinations indicated that the trouble was primarily due to root injury which had

resulted from severe winter freezes some three years ago. It has been claimed elsewhere that there was evidence of subsequent fungus invasion supplementing this climatic injury, but upon this point we have no evidence as yet. The whole question of climatic injury to fruit trees is one of the most involved with which the orchardist and pathologist have to deal, and I trust that you will not be impatient if when you call upon us for reports in some succeeding years, we repeat what we have said to-day, that there are many things about the diseases of our orchard trees which we do not understand. All we can do is to assure you that these investigations are to be prosecuted more earnestly in the next year than has been possible in the past and on the other hand, to invite and urge your coöperation in their advancement.

PUMPING WATER INTO STRAWBERRIES.

N. A. RASMUSSEN, Oshkosh.

The more water we can get into strawberries the better the fruit, so why not use the pump as water in the berries may bring us 15c per quart?

We are surrounded by water above, below and on all sides. Of that above we have no control but all the rest is at our disposal, surely there can be no reason why we should not make use of it. It costs about $25.00 per acre to irrigate, more or less, according to the season, while it costs several times that sum to cultivate and prepare for market, which sum might be almost entirely lost for the want of water.

I have tried both ways, running water on the ground, also sprinkling; but I prefer the latter method, so I shall tell you about that.

We pump the water with gasoline engine, into a tank elevated 18 feet. We run from the tank an inch and a half pipe to nearest corner of the berry patch, then also across the end. From there we run inch pipes about 60 feet apart down between the rows, placing a hose bib on every third length of pipe; then use common garden hose and sprinklers. Four lengths of hose 50 ft. each and four sprinklers will take care of an acre, watering half the patch each day; which should be the half just picked as the vines are sure to droop from the handling and a little sprinkling of water freshens the leaves and shades the fruit again.

Last year people said we had plenty of rain in our section and I should have been of the same opinion but experiment proved to me we had only about half enough. Strawberry plants want rain almost every day through the picking season, at least they will stand it and improve the fruit if they get it.

We also found that sprinkling entirely controls leaf rollers as they cannot work unless given at least 48 hours of dry weather and we give them only half that time.

Then again when the picking season is over the soil is in perfect condition for plowing and preparing for a second crop which without irrigation is ofttimes impossible.

We never use a strawberry plat more than one year. Pick one year, plow it up, plant anew again. I am not going to go any further, but I will answer questions.

DISCUSSION.

Question: Do I understand you that sprinkling the water onto the vines had a better effect than merely running along the ground?

Mr. Rasmussen: A great deal. The plants need the wetting at the roots, but the leaves need it. It is the same as a bath to us after a hot day, it revives the plants, it means a cool drink and a bath to the plants.

Question: What is the cost of irrigating a three-acre field?

Mr. Rasmussen: It depends on how far you have to lift the water, and how far from your berry patch the well is, but about $300 ought to equip you in fairly good shape, if you have not too much up-hill to travel. If I did have to travel up-hill, I would still have my tank on the high place and run the pipe to the tank, and then sprinkle from the tank.

Question: Do you pump with a gasoline engine or motor?

Mr. Rasmussen: Gasoline engine on deep well pump.

Mr. Richardson: How large a plant will you need in a three-acre patch, what horse power engine?

Mr. Rasmussen: I like about 2½ horse power engine; while it is not necessary, I think it is economical to have the large engine. The tank depends a great deal on your well. If you can keep pumping all the time and your pump is large enough, you do not need a very large tank, and I would just as soon, and I do not know but what I prefer, the water direct from the well, the colder the better.

Mr. M. S. Kellogg: Did you keep any check rows in your plantation, to know the increase that you derived from the irrigating?

Mr. Rasmussen: Yes and no. I left one corner that was a little hard to get at, and I did not think it would pay to water it, and I do not think that I got any more than one-half the returns from that land that I cut off, that is, half the amount of fruit, and not anywhere near the price for the fruit. And another thing I will state, on that corner the leaf roller worked a great deal, while on the other patch there was not evidence of any leaf roller whatever, at least they did no harm. I do not think the leaf roller can work unless he has at least 48 hours of dry weather, and we aim not to give them that. I think that is why the leaf roller did not work.

Question: How soon do you start to water, as soon as you set the plants?

Mr. Rasmussen: No, I did not this year, because we had plenty of rain. They do not need the abundance of water until the berry has

reached almost the stage where it begins to turn white, where it increases in size very rapidly, the last 48 hours I think is when it needs the water. However, if they began to show any signs of drouth, I would water earlier.

Question: Did you find any scalding from the sun?

Mr. Rasmussen: Not as much as where we did not water.

A member: My experience is that where they were watered with the fountain they were soft and they spotted in the sun and we were unable to market them.

Mr. Rasmussen: We do not set the sprinkler and leave it a whole day in a place. It will take us 24 hours to go over half the field, and it would give them about an hour and a half to two hours for the sprinkler in a place, and then we would move it. One man could attend nicely to ten acres. I think the Dunlap responded more to water than any other plant, unless it be the Bubach, although the Warfield was increased as much, but we got the choicest fruit from the Dunlap, and they did not seem to blight, which was the case in other years.

Mr. Richardson: I take it you would not advocate varieties like Haverland and Bederwood for irrigation?

Mr. Rasmussen: I had some berries in the Bederwood that sunscalded.

Question: Do you have a mulch on your berries?

Mr. Rasmussen: Yes, we mulch very heavily with marsh hay.

Question: Did you have a great deal of rain this summer?

Mr. Rasmussen: There were times when it was raining while we were watering.

Question: You think it is beneficial to sprinkle the berries when you have water otherwise?

Mr. Rasmussen: Well, we might have rain enough, but we did not have; this year we thought that we could stand more water.

Question: The idea is to dampen the leaves, it is not done just to dampen the berries?

Mr. Rasmussen: Well that depends; if the land is wet enough, then all I intend to do is to water the foilage.

Mr. Richardson: What distance apart do you put your plants?

Mr. Rasmussen: We plant about 4½ feet, setting our plants 18 to 24 inches in the row, always getting too many plants in the row.

Mr. Richardson: Don't you find your row awful wide for your picker?

Mr. Rasmussen: No, not if your path is wide enough.

Mr. Richardson: You put two pickers on a row?

Mr. Rasmussen: Always, and you need to keep them picking close together all the time.

Mr. Richardson: Don't each picker pick on each side of the alley?

Mr. Rasmussen: No, sir, one side. If you let them pick on both sides, they are apt to skip six inches or a foot. They cannot work any faster by changing back and forth.

Question: Do you think it would be possible to perforate the iron pipe so as to sprinkle the whole row?

Mr. Rasmussen: That would be the Skinner system which is now in use in a great many places. I suppose it is far ahead of what I am using, but it is quite expensive and the other has filled the bill.

Question: Did you ever try to use rock phosphate where you have old soil?

Mr. Rasmussen: I have had it on the strawberry patch for two years. I have not used it so that I could give positive proof, because it was all over the patch, but I think I can see good results.

Question: How long did you leave your soil lie before putting it back into strawberries again?

Mr. Rasmussen: The longer the better. I would like it six or seven years, if I have land enough to work on.

Question: It seems to me you cannot raise good strawberries after one crop.

Mr. Rasmussen: No, I don't think you can.

Question: Where you change your bed, don't you have considerable trouble and expense to move this watering system?

Mr. Rasmussen: No, I don't leave it anywhere. Two men will change it from one to another patch in an hour or two hour's time, taking long lengths and shifting them. We take it from the strawberries to the raspberries. We found we could grow raspberries by continuous cultivation until the fruit ripens, then we take the strawberry piping and put into the raspberry, gooseberry and currant patches.

Mr. Kellogg: Have you ever experimented with ascertaining if continued watering of the ground would have a tendency to cause that soil to be acid and need lime to correct it?

Mr. Rasmussen: I am afraid I am going to find that to be the case.

Mr. Kellogg: Is the water that you use hard water?

Mr. Rasmussen: Yes.

Mr. Kellogg: Has it quite a proportion of lime?

Mr. Rasmussen: It has a great deal of lime in it. Whether that will have an effect or not I do not know.

Question: Did I understand you to say that you thought very cold water was better?

Mr. Rasmussen: Yes, I think so. It cools off the plants that are hot, just the same as a cold drink does a man.

Question: Did you ever see any bad effect from sprinkling while the sun was shining?

Mr. Rasmussen: No, sir, we have sprinkled on the very hottest day and did not see any bad effect.

Question: You put your water in the tank first?

Mr. Rasmussen: Yes.

Question: If it is left there it gets warm in hot weather, I suppose?

Mr. Rasmussen: Yes, but when the watering is continuous, day and night, it does not have much time to warm up. Berry pickers go in the field and drink anywhere, always say it is cool. It is a big benefit to the berry pickers, they do not have to chase to the house for a drink of water, they can get it anywhere in the patch.

Mr. Toole: How soon after tne sprinkling do you do your picking? You do not want to pick right after a rain, and I presume you do not want to pick immediately after a sprinkling?

Mr. Rasmussen: We intend to give the vines time enough to dry off. As a rule it will stand over night, because if the pickers are through we switch them onto another patch. We want to follow the pickers as closely as we can. The minute they have handled the vines, get the water on, so it is as a rule 10 or 12 hours before they get back to where we have been watering after the picking.

Question: Did you say you pick only one year?

Mr. Rasmussen: One year, then plow them up, a new patch every year.

Question: When do you set your plants?

Mr. Rasmussen: We set our plants early in the spring, and pick them the following year. But there is another thing to consider in our market gardening, we plan on getting a second crop of vegetables, celery, onions, carrots, peas, after our strawberry crop. If we had lots of farm land, or if it was not worth any more than $6 or $10 an acre, as farm land is here, perhaps we would leave a patch the second year, but we are crowded for land, and do not think it best, because the fruit is not as good the second year as it is the first. In all cases that probably would not hold good.

A member: It practically takes two seasons to get one crop.

Mr. Rasmussen: Yes, it is the second season we get the crop. We still get two crops, almost three. In the first year we grow spinach, radish and such crops in the new patch, so we get crops both years besides the strawberries.

Question: What do you call an average yield?

Mr. Rasmussen: Oh, I have not any figures, but I say when we get strawberry growing where we ought to get it, we should not get below $500, when we get to growing as we ought to, and then we should crowd up to $1,000 for an annual, usual good crop.

Mr. Barnes: What is the average price per 16-quart crate?

Mr. Rasmussen: I should think they would average $2, a little better last year for the irrigated fruit.

The president: Do you sell them all in the local market?

Mr. Rasmussen: Very largely in the local market, but the irrigated fruit brought 25 cents more than where they were not watered.

Question: What is your land?

Mr. Rasmussen: It is very light clay, sandy texture, clay subsoil, most of it; some of it black loam.

Question: Do you irrigate your new set plants?

Mr. Rasmussen: We never have as yet; never found it necessary.

Question: What is your preparation of the ground for strawberry setting?

Mr. Rasmussen: Manure heavily, plow deeply.

Question: In the fall before?

Mr. Rasmussen: Why, I don't care for the time part, whether it is spring or fall plowing, never have seen any difference. I prefer

spring plowing, it is easier done, when the horses go on there it is compact enough.

Question: How do you plow your fertilizer, plow it down?

Mr. Rasmussen: Plow it under. We as a rule have a man there with a fork so as to shove it into the furrows so we can get it covered well.

Mr. Barnes: Do you think you could water on the solid clay subsoil? Would it not get baked hard?

Mr. Rasmussen: No, I would water it enough so it would not bake through the picking season, that is what I expect to do, have it heavily mulched. If the land would bake hard and you could not prevent it from baking, I do not think it would do any good to plant strawberries. I can on our land run the water between the rows and get fairly good results, but I like the sprinkling better.

WINTER VEGETABLE GROWING FOR SMALL TOWN TRADE.

W. A. TOOLE, JR., Baraboo.

Winter vegetable growing in greenhouses is an industry of considerable importance near the larger cities where there is a regular established trade for such products. The villages and smaller cities seem to depend largly on the wholesale markets of the larger centers for their supplies in this line where any demand exists.

There is an opportunity here for the market gardener or florist to grow a certain amount of these vegetables at a profit. To the market gardener especially it would seem worth while to look into this business. A greenhouse would be of the greatest assistance in the spring in starting all kinds of young plants, and it is more convenient and certain than hotbeds. It is hardly economy to invest a considerable sum in a greenhouse, heating plant, and general equipment just for the convenience and profit of its use in the spring. Some crop must be grown at a profit during the fall and winter months to make the venture pay. Carnations or other cut flowers would not do as they would have to be cleaned out of the way too early in the spring before they had returned a fair profit on the labor spent on them during their nonproductive period.

Some of the winter vegetables fit in very nicely. Chief of these is lettuce. Some ten or eleven years ago, just previous to the time when our present Secretary, Mr. Cranefield, was elected to that office, he was one of the instructors in the Horticulture Department of the University. While working under his direction I became interested in lettuce forcing. We had greenhouses at home largely used for the growing of pansy plants and bedding plants for the spring trade. This left considerable bench space idle during the fore part of the winter, although a fire had to be kept up because of stock plants and young geranium and on other small plants that only occupied a part

of the room. The lettuce growing seemed to offer a chance of utilizing this waste space at a profit. Grand Rapids lettuce, a loose leaf, light yellowish green variety is grown most generally in the West and that is what we grew as it is much easier to force and sells better than head lettuce. Our natural garden soil is a heavy clay, much too heavy for lettuce. For the lettuce we have sometimes made a compost of sod and manure, but usually we have prepared the soil by mixing well rotted cow manure, rich garden soil and sand in the proportions of two parts manure, two parts soil and one part sand. This might be varied considerably in other localities where the soil differs. The object is to prepare a light and loose yet very rich soil. Ours are raised benches that will hold about five to six inches of soil. The soil is put in even with the tops of the benches and is made smooth and level but is not packed down as would be the case for most kinds of plants. The seed is sown usually in flats or sometimes in a specially prepared section of the bench. It may be planted either in rows or broadcasted. The soil in which the seed is planted should be very sandy and may be rich but should not have much of any manure mixed with it. When the seedlings show their first or second character leaf they may be transplanted into flats, placing them about an inch and a half apart each way. If there is room they may be transplanted directly to their permanent quarters in the bench. They are easier to care for when small if planted in flats, and there is considerable economy in room if the benches may be occupied with profit for some other purpose until the young lettuce plants need moving. When the young plants begin to crowd in the flats they can be transferred to their permanent quarters. We have found that about five inches apart each way is the best distance to plant the lettuce in the benches. Take up a plant with the left hand and scoop a hole in the soil with the first two fingers of the right hand. This is quicker and handier than using a trowel or dibble to make the hole. Place the roots in the hole thus made, push the dirt back around—but only press the soil lightly against the roots, not firmly as with most plants. When a bench or section is planted, water thoroughly.

The plants will need but comparatively little labor until ready to market. They will probably not need water oftener than once a week, but should receive a thorough wetting when they do need it.

The greatest trouble will be from lice or green fly. The plants should be fumigated regularly twice a week with a tobacco extract, to prevent the lice ever getting a start. If the insects once get a strong foothold they will make a large part of the crop unsalable. When the plants have grown enough to cover the ground it is almost impossible to kill the lice if they are strongly established as the leaves protect the lice from even vapor or smoke.

A night temperature of 45 degrees seems to suit leaf lettuce and it will stand 48 degrees if you want to push along the crop, although the leaves will not have as much substance when grown at the higher temperature. The day temperature may run considerably higher, especially if it is sunny.

We start to market the lettuce when a single plant weighs two ounces. Sometimes we market it smaller than this if the room is needed for other plants or if it is necessary to keep up a succession at the stores. In that case we fasten two or three plants together by running a tooth pick through the stems. The very young plants do not keep as well in the stores as those that are older. Plunging the bunches into cold water for an instant before packing them has seemed sometimes to make them keep fresh longer. For marketing we have found the most convenient way for local trade is to pack a dozen bunches in a ½ bushel diamond market basket.

If the local grocery stores have not been used to handling lettuce it may be necessary to push the marketing for awhile until a demand is established. As soon as people realize the superiority of fresh lettuce they will not buy the shipped in stuff. At first we advertised in the display columns of one of the local daily papers something as follows:

TOOLE'S TENDER LETTUCE

FRESH AND CRISP

SUPPLIED REGULARLY TO THE FOLLOWING STORES

And here followed the names of the three stores we supplied. We received forty-five cents per dozen for the lettuce and the grocers retailed it at five cents per bunch. We replaced any that remained unsold.

The demand for lettuce is good during the holiday season, poor during the first part of January but gets better constantly as spring approaches. A peculiar feature we noticed about the sale of lettuce was that it sells fast on bright sunny or warm days but there is very little demand on cold or stormy days. It takes from three to four months to raise lettuce to marketable size in the winter. By sowing the seed for the first crop in August and having the plants for a second crop grown large enough to go out of the flats into the bench as soon as the first crop is cut, two crops may be taken off before a large part of the space will be needed for the young vegetable or other plants for the outdoor garden.

We have tried growing radishes to a small extent but without so much success as with lettuce. If they are not grown rightly the soil becomes soggy and sour or the roots do not thicken as they should. There is a good demand for them if they can be grown successfully.

One year when onions were cheap we tried forcing a few of these. Moderate sized onions were placed closely together in flats and forced along. Others were planted in the bench. The resulting green onions were rather thin but they sold very readily at ten cents per bunch of about ten green onions. I never figured closely to see if they were a paying proposition. I hardly think they would pay except when onions are very cheap.

Tomatoes and cucumbers are forced a great deal for the big cities, especially eastward, but I do not think they would pay to grow for a small town trade as they require high temperatures and special care and it is almost certain that a profitable price could not be realized for them in smaller towns, and the demand would be limited.

Pieplant is very easily forced and it may be sold at a profitable figure though not as high a price may be realized as in larger cities. Pieplant or rhubarb forces well under the bench of the greenhouse. Indeed it is quite essential that it be grown in a dark or nearly dark place. If grown in the light the leaves will be large with very little stalk and the color will not be so attractive. If grown where little or no light strikes it there will be almost no leaf and the stalk will be of the most attractive delicate pink color. Generally the best results will be secured by using plants about two yars old from seed or grown a year from divisions. The roots should be dug late in the fall and piled up on some boards or on some litter where they may be easily pried loose after having frozen solid. Cover lightly with straw to keep the fleshy roots from drying too much. Here they should remain until they have frozen thoroughly. After this they may be taken into the greenhouse from time to time as may be needed to provide a succession. It may be necessary to scoop out the soil a little where the roots are to be placed under the benches as they should have about two feet of space between the crowns and the bottom of the bench to grow in. Pack the roots together closely and work soil or sand among and over the roots. Sand works easier if it is available and is just as good as soil as all of the growth is made from water and the food stored up in the thick roots. Board up the sides of the bench or hang curtains of cloth or paper to keep out the light. Keep the roots well supplied with water and the crowns will soon break and send up stalks. The rapidity of growth depends both on the heat and the time of year. Those brought in first will not force so fast as those that have been left out longer. The higher the temperature, the quicker the growth. Too high temperature induces a weak growth and less pounds of stalks. When the stalks appear to have reached their full size, remove carefully down next to the bud. Trim the stalks and wipe off dirt with a damp cloth but do not rub hard as it injures the delicate appearance. To sell readily in quantity to a small town trade it cannot retail much over ten cents a pound. The grower should receive eight cents. The stores will probably want more margin for profit but they will come around to your prices if you stick to it. Perfectly fresh vegetables make a good drawing card for other trade, and this fact should be forced on the store keepers' attention when making a bargain.

Asparagus is forced also but I have never tried it myself. It is doubtful if it would pay in a small town. Large old roots should be used in forcing asparagus.

These experiences may not fully coincide with practices in large establishments where vegetables are a speciality but they are offered as of possible value to the market gardener or florist growing for small town trade.

SOMETHING NEW AND SOMETHING OLD.

H. B. BLACKMAN, Richland Center.

I have long ago come to the conclusion that the great secret of growing strawberries profitably, and the one most difficult to discover, is to find out the varieties which are best suited to the particular soil in which they are to be grown. Not only has this been my own experience, but I have noticed in studying the reports of different growers and of experiment stations, that while one variety may do exceedingly well in one place, it will prove almost, if not altogether worthless in another. The strawberry differs, not only in productiveness and vigor, but it seems to vary also in firmness, size, color, and ripening periods. While this may be partly due to weather conditions, still I think that the soil in which they are planted has a great deal more to do with these variations; for I often note that one variety will be reported firm in one locality and soft in another. Frequently we see a certain variety doing extra well in some one place and fail to find it favorably mentioned anywhere else. These variations occur, not only in the new and untried kinds, but even in the old standard sorts, although to a less extent.

In the selection of varieties it is useless to go by descriptions given in nursery and plant catalogues, as a variety may do exceedingly well on the particular spot where it originated and yet may be utterly worthless nearly everywhere else. A great many new varieties when first introduced do extra well the first few years, then they seem to develop weaknesses and prove unreliable for general planting. I remember the first two years that I grew the Cardinal strawberry when it was first introduced. I do not think that I ever grew a variety that was more productive. Its color, size, shape and firmness were nearly perfect. In healthy vigorous plant growth it had few rivals. As compared with other popular varieties at that time or since, it was far superior to any of them. After these two years that I grew it with such success, the third year it turned out to be a complete failure. I have tried to grow it a number of times since, and it has been a disappointment every time. The Clide, Challenge, and others whose names I fail to remember turned out a good deal like the Cardinal. I would not claim that the failure of the varieties was caused by weather conditions, location, or the soil in which they were planted, because I am sure such is not the case in these varieties; but I do believe there were certain weaknesses back in the original plants where these particular varieties sprung from, and as they never became permanently fixed in their habit, they soon reverted back to some of these weaknesses.

I would not presume to name the best variety, as it is positively something that every man must find out for himself. The safe plan would be to select varieties that seem to succeed in nearly all locali-

ties. I would also choose a few of the most promising new varieties for trial. In my selection of varieties, I would never trust to any one or two varieties of strawberries—as someone has said—not even if I could get plants of the kind that grew in the garden of Eden. My reason for this is that while one or two varieties may be ruined by a freeze, the chances are that with five or six different kinds that there will be two or more varieties that will come through uninjured. This has been my experience in the past, and I believe it will hold good in the future.

Almost any soil that will grow a good crop of corn or potatoes will be found suitable for strawberries. Land that would produce one hundred bushels of corn to the acre would be much more preferable than land that would grow only fifty, for it will never pay to try to grow berries on poor land. My advice would be not to select sod land in which to set strawberries for the reason that such land is liable to be more or less infested with the larvae of the May Beetle, which means destruction to your strawberry field. I would not set on land that would run together becoming hard and cloddy, until it could be brought back to some of its former fertility.

My most satisfactory results have been obtained by using liberal supplies of well rotted barnyard manure, and I feel safe in saying, that there is nothing better nor even as good; but I would not hesitate to use a good grade of commercial fertilizer if I could not get the manure, as I have used it with good results. I find that spring is the best time to plant strawberries, and the earlier the better. Before growth begins the plants are dormant, and it does them very little harm to be transplanted, but after growth commences the plants are more tender and the change affects them more seriously, especially if the weather is hot and dry soon after.

After trying the different systems—hill culture, single and double hedge row, and half matted row—I have adopted the last mentioned system as the most profitable. By this method I get much more fruit which will average nearly as large and fine as in other systems with much less labor and expense. Another important item I wish to call attention to is that thorough cultivation must be given the plants from the time they are set out until the close of the growing season. Neglect of this will often result in failure, especially in a dry season.

When the ground is frozen in the fall, I mulch the plants with some kind of material which is easily procured. Marsh hay, straw, corn fodder, or waste excelsior all make good mulch for strawberries. In the spring when the plants begin growing, I rake the mulch between the rows and leave until the fruit season is over. I then mow the vines off, and rake up and leave part of the mulch on the row. When perfectly dry, I set fire to the bed and burn it over. This destroys about all the weeds and grass that have started, and also the rust spores and insect pests, and the burning will not injure the plants if a little caution is used,—that is, the mulch should be raked up loose on the rows with just enough on so it will burn to good advantage.

In cultivating the old bed I harrow up the row very little, as some

seasons the old plants make few new ones if any, and for all I can see the old plants are just as good or even better for fruiting. In nearly all instances the old renewed bed has proven the most profitable.

During the past fifteen years I have tested a great many different varieties of small fruit plants. Detailed reports would be too long and tedious, but I will give a brief description of a few of the most promising varieties, both new and old.

Bubach—One of my favorite varieties, has never failed to produce a good crop of handsome berries, succeeds in nearly all kinds of soil, will stand more heat, drouth and frost than any variety I know of.

July—Flowers imperfect, blooms late, ripens in late midseason. Plants medium in number, very vigorous and exceedingly productive. Berries a bright red, medium in size, quality fair for a tart berry. The value of this variety lies in its productiveness and lateness.

Fremont Williams—Flowers perfect, blooms late; plants large and medium in number, vigorous and fairly productive. Fruit large, smooth, and glossy red in color, firm and of good quality.

Senator Dunlap—Was almost a failure the past season. I think this was partly due to the fact that it was planted on very heavy clay soil, and my experience is that Dunlap is not a success when planted in such soil.

St. Louis—Flowers perfect, matures extra early; plants are numerous, vigorous and productive, fruit large, soft, and lacking in flavor and color.

Fendall—Flowers imperfect, matures in midseason, plants are numerous and very productive. Fruit is large, irregular in shape, and seriously lacking in flavor, color and foliage.

Highland—Flowers imperfect, matures early to midseason. Plants medium in number, vigorous and very productive. Fruit large at the first three or four pickings, afterwards dropping somewhat in size. Berries bright red, very juicy, good in quality for a tart berry.

Meator—Flowers imperfect, matures in late midseason, plants are very numerous and productive. Foliage is an attractive dark green free from all disease. Fruit large, dark red, firm and of good quality, one of the most promising new varieties.

Ohio Boy—Flowers perfect, matures about midseason. Plants are large and numerous. While tested under the most unfavorable conditions, it was one of the most vigorous, healthy growers on the place. Fruit large, and the quality extra good. While there have been some unfavorable reports from this variety, so far I am more than pleased with it.

Pocomoke—A good healthy grower and an immense cropper of large, solid, dark red berries of good form and quality. This variety will not succeed in a dry, hot location, as most of the blooms will blight under those conditions.

Gibson—A new variety, very closely resembling Pocomoke.

Paul Jones—Flowers imperfect; a promising new variety, and a vigorous grower. The fruit is large, resembling the Haverland to some

extent. I hear nothing but favorable reports of it from wherever it has been tried.

Monroe—A strong healthy grower, plants medium in number and productive. Berries a dark red, large, of very good quality; has met with praise wherever tested.

Helen Davis—Flowers imperfect; makes a medium number of strong healthy plants. After one year's trial, I would regard this variety as promising. While there have been extravagant claims made for this variety, if it proves half as good as claimed, it could be considered as valuable.

Norwood—Flowers perfect; makes a moderate number of plants which resemble the Marshall, but is a better grower and more productive. Quality extra good.

Americus, progressive, and *Superb*—Fall bearing strawberries. As I had all three of these varieties in an unfavorable location, I could not give them a fair test. The new plants ripened up some very fine berries; as to yield, they were far from a paying investment. Perhaps they will give much better results under more favorable conditions.

Productive—Ever-bearer; not desirable, as plants are weak growers, easily succumb to disease, and are unprolific. Not a true fall bearer.

RASPBERRIES.

Early King.—I would consider this one of the best red raspberries ever introduced. I have grown it ten years or more and it has never failed to produce a profitable crop of fruit. Berries large, firm and of good quality. Canes vigorous, hardy, and free from all disease.

Sunbeam.—A very promising new red raspberry. Canes hardy, vigorous, and free from disease, while the berries are not as large or firm as the Early King, their quality is better and fully as productive.

Plum Farmer.—The best blackcap I have ever grown and the only one I am now growing. The past season, I had three rows of the Plum Farmer (each row being about five rods long) which brought one hundred dollars clear, which speaks for its productiveness.

Carrie—Gooseberry, vigorous, hardy and free from mildew, and a great many thorns. Very productive, berries averaging as large as the Pearl gooseberry.

Hansen Plum Sapa, Opata, and Hanska.—The young trees will commence to bear fruit the second year from planting. Very vigorous, hardy, and productive. Quality extra good. I consider the Hansen plums far more desirable than any of the native plums that we are growing to-day.

STRAWBERRIES.

W. S. POWELL, Bayfield.

I am not going to give you the history of the strawberry, but for the benefit of the new beginners, will point out some of the essentials in growing them commercially.

In the first place know that your soil is in first class physical condition and also that it is adapted to the growing of strawberries. Plow quite deeply in the fall if possible, turning under a green leguminous crop if you can, but do not harrow it down until spring, leaving the ground as rough as possible, as the freezing and thawing and the aeration will make it mellow and will also freeze out and destroy a great number of insect pests and eggs of same. Commence harrowing in the spring as early as possible and as soon as your plants are ready to dig, commence planting. Be sure the varieties you plant are adapted to your locality. You may find this out by inquiring of some one in the neighborhood, the names of the varieties they have had the best success with. Do not try too many varieties at one time as not all of them will be adapted to your soil and climate.

In setting them, set them in rows 3½ feet apart and from 18 to 24 inches apart in the row. The heavy plant maker should be at least 24 inches apart in the row. Set them with a spade, one man using the spade while the other man places them in the trench made by the spade, spreading the roots out fan shaped, placing the crowns even or a little below the surface of the ground.

Commence working in them as soon as possible after planting, if it be the same day. I prefer using a garden rake, raking between the plants toward the center of the row. By so doing you fill the space that is sometimes left open by the planters not being careful, therefore avoiding the escape of moisture and the raking also causes the plants to show up better, when you start the cultivator. Shallow cultivation should always be practiced which causes the moisture to remain close to the surface. Frequent and thorough cultivation should be given at all times if you wish to get a good growth of plants for your next year's crop.

Do not need to take up any of your time explaining about training the runners but I want to dwell upon what will soon be the main question of the growing of strawberries and that is the use of commercial fertilizers. Our older growers tell us there is nothing more to write about the strawberry but I am going to predict that a new and better method is awaiting the man who will start experimenting with the different fertilizers. How many of you have used commercial fertilizers and in what proportions, also is it necessary to have soil examined in order to ascertain what is best to use. Some will say yes and others, no, as it is impossible to learn how much of the mineral elements already in the soil are available.

Do any of you know what our State Experiment Station is doing in the way of testing out the use of the different commercial fertilizers on the strawberry fields? The only one I have ever been able to find is a report of the Missouri State Experimental Station on the strawberry fields of Neosho, the strawberry center of the middle west. They have been experimenting for the past 3 or 4 years and during that time have found that phosporic acid applied to the land, about 400 pounds to the acre has increased the crop nearly 100 per cent. They have used nitrate of soda alone and combined with potash and combined with phosporic acid and find that with any of the combinations in which nitrate of soda had been added that the crop was decreased nearly one half. They state that the nitrate of soda assists in growing large thrifty plants but does not produce fruit buds.

Prof. Cyril Hopkins of Illinois, now of Massachusetts, is authority on soils and claims that ground phosphate rock is practically the only element in the fertilizer line that is necessary to produce large crops as the decomposition of it liberates some of the potash and the nitrates that are contained in the soil, but one must plow under more or less green crops, which produces sufficient humus and nitrates.

Why can we not start experimenting with the mineral fertilizers and report at the regular meetings the results of our experiments? Let us see if there is not something new about the growing of strawberries. There surely ought to be something as none of our Horticultural departments are a finished science, for we are learning something new every season. Mr. Rasmussen has told you how to pump water into the strawberry which certainly is something new and I will predict that in a few years that by the use of the right application of the mineral fertilizers we will double the yield of our crops. Some may say that we will have an overproduction of them but Kern will sell them if you will give him the chance.

There is one thing that I have learned and it has been a dear lesson and that is that you cannot make a success of growing strawberries on new land, such as we have at Bayfield. While we raise a fairly good crop and of good quality on such land the record breaking crops are grown on old soil specially prepared for it.

In closing will say that the coming spring I will plant about 15,000 plants and will use ground phosphate rock, drilling it into the ground each side of the row with a one horse disc fertilizer drill, drilling it immediately after setting the plants, and will report the growth of the plants next year. How many of you will do a little experimenting and do likewise?

RASPBERRIES.

J. T. HAUSER, Bayfield.

So much has been said and written on the culture of raspberries and so generally are they grown in our state that a person can simply say nothing new on the subject. Next to the strawberry the raspberry is the most popular of small fruit. It can be grown successfully in every part of our state. It will thrive in places where the strawberry would be a failure. It will bear some fruit under the worst neglect where under the same treatment the strawberry would be a complete failure. The raspberry would therefore be a more desirable fruit for the farmer to grow than the strawberry but like all other cultivated crops it will respond wonderfully by giving the proper care and cultivation. It thrives best in a rather cool and moist location but drainage is quite necessary. The finest black caps that I have ever seen were growing on lowland that at times was so wet you could hardly drive a horse over but the land was ridged up two or three feet where the plants were growing. The preparation of the soil should begin a year or two before it is planted; manured heavily and cropped by some cultivated crop one or two years previous to planting. This will put your soil in good tilt and free from weeds. Never plant on land that is full of clover, timothy or quack grass. Sod land is not fit to plant small fruit of any kind on. Spring is the best time to plant yet I know of good success of fall planting up in our country where we had a good covering of snow from early winter until late in the spring. Plant in rows 3 feet and the rows 7 or 8 feet apart. The first year a row of something else can be grown between. Last year we grew tomatoes in ours but they grew so rank that it interfered somewhat in the later cultivation. Cabbage, beans or peas would be a more suitable crop to grow between. Hoe and cultivate thoroughly and often not only the first year but ever after for they need lots of moisture to grow a good crop. At no time is cultivation more important than at picking time. I wish to emphasize this especially for this is a period when it is so often neglected. Follow the pickers with a cultivator and stir up the trampled down soil. It will mean a longer bearing season and good large berries to the last.

I do not believe in mulching between the rows but instead cultivate to break up and pulverize manure particles thus making it available for plant food. I believe a good fine dust mulch will hold more moisture than anything else.

Shall we prune and cut back the canes during the summer is a question where some of us differ. I think that depends a great deal whether or not you lay down the canes for winter protection. Where it is necessary to put them down it is best not to pinch back any during the summer as they will grow too stiff and stalky to bend over without breaking them. They should, however, be cut back in the

spring which insures better, larger and cleaner fruit. Summer pruning depends somewhat on the variety you are growing. For instance Cuthbert seems to throw out a good many more laterals then the Marlboro. If you do any summer pruning, do it early enough so as to give the new shoots time to ripen the wood.

All suckers not wanted treat as weeds, cutting them down while they are little before they have sucked half the life out of the bearing hill. After picking, cut out the old canes and seed down to crimson clover. I like this plant best as cover crop. It is the only clover we can grow in the berries that will not become a weed. It makes a larger growth than any other clover would in that time and judging from the nodules on the roots it seems to have the power to gather more nitrogen in the *early* stage of its growth than any other legume I know of. With us in the north, it sometimes lives over but being a biennial plant it will die the next season. I consider this the best plant to grow in all cane fruit as a cover crop. As to the varieties to grow we favor the Cuthbert and Marlboro, giving the latter the preference, as it picks easier, ships better and yields more than the Cuthbert. The Cuthbert is far best in quality, a little later and possibly hardier than Marlboro. The reds reproduce themselves and are propagated by suckers.

For black raspberries we grow the Plum Farmer, a vigorous, hardy, large growing, good quality berry. All black caps are propagated from the tips by covering them in August or September and then cut off the cane when wanted for transplanting. I think the black caps are going to be the most profitable ones for us to grow. Last year they sold, I think, for a little more than the reds. They stand shipping better, pick more berries at a picking and it is much easier to get pickers to pick them.

In the picking of raspberries possibly more pains should be taken than in the picking of any other fruit. Wet berries put into a box on a warm day will grow whiskers in a very short time. Care must be taken not to get any over ripe berries in the box nor bruise or crumble when picking. They should be taken into a cool, breezy packing shed as soon as possible.

THE DISTRIBUTION OF HORTICULTURAL PRODUCTS.

A. K. BASSETT.

Why does the grower get only 35c of the consumer's dollar? Primarily, I should say, because he doesn't go after it right.

In this day of rush and scramble for the almighty dollar, the average grower does not stop to give much thought to "marketing", the most important feature of fruit raising. He is not a wide-awake business man and leaves that part for someone else to do. The middlemen are very glad to do it and make it very easy and convenient for the grower. The grower is very willing to let the other fellow do the selling, and takes the easy way. He stamps the barrels with the stencil sent him, carts them to the depot, and then watches the mail for his check. If he gets as much as 35c of the consumer's dollar, he is delighted, and never gives his trees another thought until next picking time, when other farm work is begrudgingly stopped for a short period and the whole family rushed out to strip the trees of everything they dare put into the barrels, when the same are stamped and hurried off again to help congest the market.

Once in the hands of the middleman, the apples which probably brought the grower a dollar or two a barrel begin to soar in value. The commission man, the wholesaler, and the retailer, each in turn, want to get a fat slice. And by the time the consumer who comes into the store pinching his nickels, buys them in 10c lots and has them delivered to his door, the apples have trebled in value.

It is hard to get at the root of all evils, but it seems especially so in the case of fruit distribution. In the first place, the growers who ship poor fruit do an injustice to those who are honest and ship only fruit of good quality.

The railroad companies often get a big slice for hauling them back and forth, but they justly earn their share. The commission men have for their motto,—who can blame them—"get a lot while you're getting". It is self-evident that there are far too many in this class, and if half of them would go out into the country and pull quack grass and kill potato bugs, we wouldn't read of so many of these firms suffering financial distress.

It seems to be the desire of everyone to ship to the large cities, causing a congestion of fruit there, when probably within a few miles from the place where the fruit is raised, there is a shortage. By the time it is again shipped back, the freight rates, cartage and commission fees, have added considerable to the price of the fruit which, on the other hand, has deteriorated. Very often all the late apples are shipped out of a locality to be put into storage in the city only to be shipped back again to sell at a big price.

Thus we see that no matter how honest the buyers may be, the marketing is done in such an unsystematic and round about way that

it is bound to be expensive, even by the time it gets into the retailer's hands. We are all aware that this class, too, is far too numerous and half of them ought to be helping with the quack grass and potato bugs. They must charge heavily to meet expenses. Here, too, the consumer is at fault by buying in extremely small quantities. Usually 10c worth—just enough to make a pie—or a few to put into the fruit dish to help decorate the sideboard when company is expected. Usually this small quantity has to be delivered and often the retailer must wait from one to three hundred and sixty-five days for his pay.

Often, too, the consumer is not satisfied to buy the good home grown fruit which the retailer can purchase for far less money. They want Baldwins and other eastern apples, which cost more in getting here than they originally sold for. Or else they want those pretty, flavorless Western apples wrapped in tissue paper.

I was reading recently of an American firm that imported a lot of French Cheese boxes in which to sell their cheese. Now the consumer will pay twice as much for that cheese, and it will taste better because he thinks it came from France.

Last fall a Baraboo lady showed me with great pride a peck of Pound Sweets which she had purchased in Milwaukee for 40c and carried home. No doubt they were some which our President Palmer had shipped there. But people are anxious to get things raised away from home. I know it to be a fact that some of my neighbors go 12 miles to buy apples in the Palmer vicinity and some of Palmer's neighbors come and get apples from me.

Many consumers are reducing their high cost of living by buying direct from the growers and I think many more would do so, but they have been swindled so many times that they have lost confidence in that way of buying. Too often the grower tries to get even more than 100 cents of the consumer's dollar. He sends him inferior fruit and perishable varieties instead of good keepers. I heard one of my neighbors tell of an auto party which stopped at his place at picking time and left money for two barrels of select winter apples. When he shipped the apples, he sent them Longfields. Needless to say, this consumer was greatly disappointed, as he expected to get apples that would keep all winter.

Very often the grower makes it very inconvenient and very expensive for the consumer to get fruit at all. They claim it is a great hindrance to bother with a few barrels, especially if they want mixed varieties and for that reason place an extra high price on the fruit. Very likely he gets off an odd barrel on them which he couldn't dispose of in any other way.

One reason the grower gets only 35 cents of the consumer's dollar is due to the fact that he raises too much hog-feed and not enough good fruit. Nevertheless he is anxious to sell this poor stuff at any price. Thus it becomes a drug on the market and a check on good fruit. It seems queer that with all that is preached and printed about spraying, many growers, some of them good horticulturists, still keep on raising scabby, pinched, and nubby fruit. It is certainly a poor ad-

vertisement and sets a bad example for those who pattern after us.

Not only are there too many poor apples raised, but too many poor varieties are planted. Many varieties will not stand shipping. If we wish to get more than 35c of the consumer's dollar, we must raise varieties which will keep long enough to make it profitable for the consumer to buy them by the bushel or barrel.

If all the growers would agree to sell only No. 1 fruit and give the remainder to the hogs, I think they would have no trouble in securing the coöperation of the consumer. The idea is becoming very popular, all the consumer needs is confidence in the grower. Then the grower might receive 50 or even 75 cents of the consumer's dollar. Not only would the grower receive more for his apples but the consumer could afford to use more.

The grocery and fruit merchants will always handle apples. If the growers were well organized and sold only No. 1 fruit, they could dictate the price the retailer should charge the consumer when selling in barrel lots. By this method, the consumer ought to be able to purchase his fruit at a more reasonable figure, and it would also increase consumption.

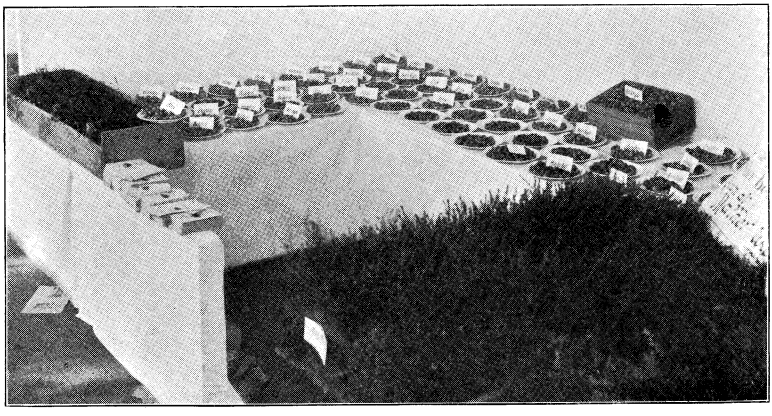
In selling direct, the grower must have acreage enough to supply fruit every year, and he also needs cold storage on the farm so he can supply his trade during all seasons of the year.

There is an old saying that:

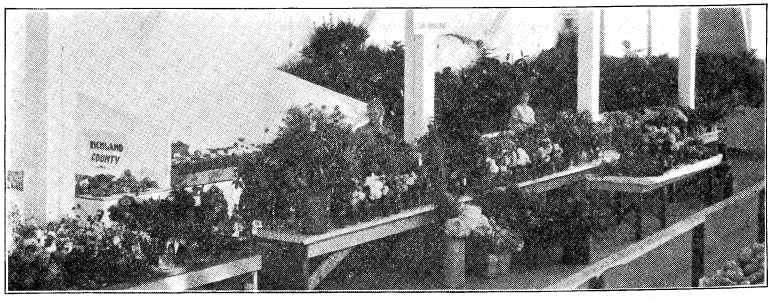
> "For every trouble under the sun
> There is a remedy or there is none.
> If there be *one*—go and find it;
> If there be *n*o*ne*—never mind it."

I think in this case the best remedy is to be your own middleman.

Bayfield at the 1913 State Fair.



Cranberry bog and fruit, State Fair 1913. Shown by State Cranberry Growers Assn.



Some of the flowers in the Amateur classes, 1913 State Fair.

PROBLEMS IN MARKETING.

F. KERN, Bayfield.

I have been before you on this subject at least once before and while I do not know that there is anything new to be said on it there are always new people in the business who may be interested.

It is *the* subject that interests *us*, we horticulturists. We are all *vitally* interested in the question of marketing, and *some* of us are vitally interested in the *problems of marketing* and I happen to be one of them.

Really, it is the successful marketing of any crop or product that makes it profitable. It matters little how cheaply you are able to produce a crate of strawberries, if you are unable to reach a market with them, they are a total loss. You have lost all you invested and your effort as well, but if you are able to reach the best market with them you can grow them at a profit.

Some growers, and some fruit growing districts are favorably located by having the markets at their door. I have in mind Oconomowoc, for instance, with Milwaukee within such a short distance that strawberries absolutely fresh can be laid down for a very cheap express rate and can always find a ready market at the very top market price for they are not growing so many that they are overstocking the market. There is no problem there.

There are so many problems of marketing that I scarcely know which or how many of them to discuss here, but to me, proper distribution seems to be the most important. *Proper distribution* with most of us is an unknown quantity that is always represented by *X*. Perhaps *XXX* would represent *proper distribution* and *X* would represent *distribution*..

Proper distribution in my judgment is the placing a shipment of berries in a market where they are wanted and keeping our berries out of any market that properly belongs to some other district. For instance when we have berries at the same time that Excelsior, Long Lake and Minnetonka, Minnesota are on the market, they being within thirty or forty miles of Minneapolis, we ought not be shipping more than two hundred miles, into Minneapolis. That market belongs to the growers who are favorably located. They can deliver fruit at a lower price than we can as the rates are a great deal lower. They can deliver them in a great deal better condition than we can. Then why should we at Bayfield dump a portion of our crop into Minneapolis when these points can supply that market to so much better advantage than we can? Suppose Excelsior is on the market when we are at Bayfield and that they are able to get $1.75 per crate for berries in Minneapolis, because of their excellent quality due to the very favorable conditions of short haul, etc., and we will suppose that we are picking equally as good berries at Bayfield, but, being more than

two hundred miles from Minneapolis we cannot get them on the market the morning following the day we load them, but we think that Minneapolis ought to be a good market and we ship a car, or two or three cars, daily to Minneapolis because we do not know where else to send them. They arrive late; are carried over to the next day and come in competition with the fresh stock from Excelsior. Who suffers? We both suffer. My berries sell, they all sell. But because I have shipped too many berries into an already stocked market they sell at a low price and because mine sell at a low price they bring down the price on the good stock that would have otherwise brought a profit to the shippers. This is not all the harm we have done. We have broken a good market for the balance of the season. Who broke this market, Excelsior or Bayfield? To whom did this market belong? This is *distribution* and is represented as we said at the beginning by *X* and one of the problems of marketing a perishable crop is to avoid such conditions.

How can we avoid a recurrence of such marketing? I should say that it would be well to have a broad enough market and be well enough posted on all the *different* markets and have a reputation for *quality* so that you will not be compelled to overstock Minneapolis.

In order to do this it would be necessary for every fruit growing district to be organized and the shipping handled for each district by some one man. With such a system we could all keep in touch with our competitors as to amount of fruit going to the different markets and in that way get better distribution. Under the present system we are all shipping to points we ought not to and we are leaving untouched many points we should reach to better advantage, because we do not know what the other district is doing. Washburn and Bayfield are both heavy shippers of Strawberries. Washburn is but thirteen miles from Bayfield but owing to the difference in soil, Bayfield berries are on the market about a week earlier than Washburn berries and we ship quite a few berries to Washburn during that week, but as soon as Washburn berries are ready for market we do not ship to Washburn. Why? Because we are in touch with the manager of the Washburn association and know that they have berries of their own and that in order to sell berries in Washburn we would have to cut the price, and that would only force their price down and we would both lose. *We know better.*

Here is another problem: We ship a car of berries to St. Paul to a commission merchant. This car goes through Spooner, Shell Lake, Cumberland, Turtle Lake, Clear Lake, New Richmond, and Hudson to St. Paul. The Commission merchant reships small lots, say two to five cases to every merchant in every one of these towns. A freight charge and an express charge on every shipment to every merchant in every one of these towns. WHY?

Because our system is wrong. Because we are behind the times in marketing. The berries do not cost the commission man a cent. We give them to him to sell and we allow him to take out whatever he thinks his time and trouble is worth, to do the *very thing we ought to do ourselves.*

Another problem that we have at Bayfield to contend with is the pool commission house. It is a fact, I do not know whether many of you know it but I am prepared to prove that the pool commission houses get two commissions out of every car of berries that we consign that is split up among the members of the pool. Since I have learned this double commission system I have either sold outright or have not shipped them at all. During the past season I sold but one car to the pool. I consigned to several independent commission firms with very satisfactory results. I sold one firm a car of berries practically every day of the crop and I collected every cent on every invoice and did not sell a car below $1.50 per case. I had opportunities to sell cars in that firm's trade limits but I staid out of its territory because it could handle as many as we both could and could get a reasonable price and therefore could afford to pay me a good price. What could I expect to gain by taking a part of that trade? I believe in protecting your customer every time that it is a real benefit to our growers, by giving him all that he can sell and keep a healthy market. The only day that I think I failed to ship this customer was when he called me up and told me that he had received a car of Washingtons on consignment and advised me to divert the car that day, which I did. I did not get as much for it as I had been getting but I kept that market healthy for several other cars that followed and on the whole I profited by taking a loss on that one car by shipping it out of the territory. This instance might be represented by *XXX*, but it is the only instance I think on my records. It is my plan to do better in the future.

In 1912 I had a good market in a town and was selling outright at a good price, $1.85 per case on track. A commission man in the opposite direction was trying hard to get me to consign and I was trying equally hard to get him to buy. He simply would *not* buy. I had not shipped a berry to this commission man nor had there been a crate of Bayfield berries shipped to any man or firm in that city up to that time. This commission man, we will call him Goodman, called up my customer who had paid me $1.85 that day and offered him Bayfield berries at $1.60 delivered. You can imagine what my customer called me. He called me up and then called me down and when I finally got a chance to get my breath and explain that Goodman had not had a berry nor had any other man in his city had a case of our berries nor as much as a price below $1.85. I was obliged to put up $100 as a forfeit if my customer could buy a car of Bayfield berries from Mr. Goodman. I never was called upon to forfeit the money and I held my customer, but Mr. Goodman has never had a case of our berries from that day to this. This is another problem of marketing.

At a meeting held here in Madison during our winter meeting last winter, an attempt was made to get together on a State marketing association. That, in my opinion, is the only method of solving the marketing problems, and it will take a long time to perfect that, so that it will solve all the problems of marketing, but it is certain that it could be accomplished and that it should be accomplished.

So much has been said about marketing direct from the producer to the consumer. This is an attractive proposition both to the producer and the consumer. I am going to predict and without fear of contradiction, that it cannot be done unless the consumers organize and the producers organize. How am I, a producer, to know that Mr. Cranefield, the consumer, is responsible and that I will get my pay for the berries I ship unless he belongs to some organization that will guarantee his credit?

There must be something like a Buyers' Credit association where each member can establish a credit and place his order, before the producer will have faith in his customer, and the producer must also show that he is reliable if he expects the consumer to send cash with the order. It has been shown, too, that where there was no organization at the producer's end he will set the price and later when the order comes he will have had a chance, or he will think he *will* have a chance to get more money and he will raise the price and if the consumer is satisfied to pay the increased price the producer feels sure that his price is too low and he again raises it. In a test being tried out now by the express companies this has proven their greatest obstacle.

I am an agent for the American Express company and they are trying out this system. They send out forms and we agents are expected to confer with some producer and see for what he will furnish the commodities mentioned and refer his name to the superintendent of the express company who then places his order with this producer for so many of these packages and they are shipped direct to the consumer who has paid the express company for the package in advance. The system is planned all right but the producer does not stick to the price. If both the producers and the consumers were thoroughly organized and we had a State Marketing association the problems of marketing would be solved.

I do not mean that organizations all succeed.

Records show that it is difficult to organize the producers and maintain a good, strong working organization.

There is a reason, perhaps several reasons, but what seems to me to be the prime reason is, that they seldom ever finance their association as they should; they start with a small capital and after it is once started they think it should always run without assistance. This is a serious mistake. Marketing associations must be supported by every member to succeed.

This brings to mind the State Marketing association of Minnesota. I happened to be present when that association was organized and there is no question but that their plan was good and the association would be of great benefit, not only to growers of the state of Minnesota, but of Wisconsin and Iowa and perhaps many other states, if all who believe in such an organization would support it until it was able to stand alone. They organized. They elected officers. They rented offices and they furnished them. They hired a manager. It sounds good so far, but they started with about ten per cent of the

capital they should have had and when their business had grown as it has to the handling of nearly two thousand cars a year the stockholders of that association pat themselves and tell what a wonderful association it is and the manager is besieged by every shipper to advance him money on his car and he is sweating blood day and night to hold a wonderfully growing business together for the benefit of the growers who are the stockholders, and if it should fail it would be we shippers who fail to put any money into it that are at fault. What is true of the Minnesota State association would be true of a Wisconsin State association, yet I believe that a State marketing association is the only logical method of solving the problems of marketing.

OUR HOME MARKET.

W. J. MOYLE.

In looking over the State at large, we find that there are five hundred or more cities, with a population of five hundred or better; and furthermore on investigation and inquiry of the grocers, of these towns, we find that fully two-thirds of them have to import practically all of the fruit consumed.

Here in our estimation, lies a fertile field for horticultural extension work. We don't doubt for a moment, but what all of these towns would be provided with home grown fruit provided, we could prove that a five acre fruit farm, properly planted is a possibility within the reach of the average mortal and would also prove a howling success.

Ever since the days of Adam we have had model fruit farms drawn for us on paper, and we have seen many set out, only to watch them degenerate into a patch of weeds. The object of this paper, therefore, is to map out a practical, successful, financial fruit farm of five acres. In the first place we want to interest the attention of 500 young farmers who are at present engaged in general or dairy farming, within a mile or two of any of these towns. These young men should be successful in their present occupation, that is be able to make both ends meet and not afraid of dirt or work. With this foundation we will ask them to set aside five acres of the best soil on their farm and plant according to directions. Success will be theirs and this piece of land, will be found the most remunerative on the farm.

First, set aside 2 acres to apples as follows; 100 trees to the acre, rows running north and south 30 ft. apart and trees 15 feet apart in the row. 50 *Tetofsky*, 50 *Duchess*, 50 *Wealthy*, 25 *Fameuse* and 25 *N. W. Greening.*

½ acre of Red Currants, *Fays Prolific and Perfection.*

¼ acre of Gooseberries, *Houghton.*

¼ acre of Red Raspberries, *Cuthbert.*

¼ acre of Black Raspberries, *Kansas.*

½ acre of Blackberries, *Eldorado.*
¼ acre of Grapes, *Moores Early and Concord.*
1 acre of Strawberries, *Dunlap and Warfield.*

The above list can be changed according to locality, but all of those mentioned have proven their worth, over a large extent of territory in our State.

This land should be in a good state of fertilization before planting, then afterwards given the best of cultivation. The first years, hoed crops such as potatoes, beans, etc., should be grown among the apple trees, with a liberal application of barnyard manure to keep up the fertility of the soil.

We assure our reader, that bountiful yields and an ever ready demand, right at your door, at the highest prices, will cause you to look upon this project, with satisfaction and pleasure.

"THE GROWER RECEIVES 35c OF THE CONSUMER'S DOLLAR. WHY?"

FROM THE VIEWPOINT OF THE COMMISSION MERCHANT.

Paper by M. C. KIPPER, Sec'y Milwaukee Produce & Fruit Exchange.

The topic for discussion, "The grower receives 35c of the consumer's dollar. Why?" is indeed, a lively one, as is noted on the program. Not only is it a lively topic, but is one, also, that might be discussed indefinitely, without any apparent success toward arriving at a conclusion.

Speaking from the point of view of the commission merchant, it is hard to conceive how 35c was the accepted amount that is received by the grower for each one dollar that is spent by the consumer. To my mind it may be that, or it may be more, or it may be less. I do not believe it to be possible to determine with any degree of accuracy the amount that is received by the grower for his product from each one dollar that is spent by the consumer. If it is intended that the figure, 35c, is the difference on one particular transaction, and for one certain commodity, then I am wrong, but I do not think that is the intent. My remarks are based on a general average for all commodities and for a reasonable period. I will admit that the grower does not receive one dollar out of each one dollar that is spent by the consumer. Were I to designate a figure representing that portion which he does reecive it would be merely a guess. There would have to be taken into consideration to make a calculation a great many things the kind of commodity, location where crop is produced, its proximity to a common carrier, time of marketing, condition at time of marketing, the requirements of one market as compared with those of another, cost of handling the different commodities, shrinkage, etc., etc. I am afraid that a corps of mathematicians would find themselves baffled if an attempt were made to determine a true average.

I stated, and we all know that the grower does not receive one dollar out of each one dollar the consumer spends for his product. In these days of "high cost of living" and high prices, the paramount issue with the members of your society is "why is not the amount the grower receives for his product greater than it is." This is explainable, and it will not take long to do it, by the new conditions which have arisen, and which confront us on every side. New standards of living by the public are in a measure responsible. The market basket of our grandmother's time now adorns the relic room, along with the old spinning wheel. Ordering is done largely by telephone, and the demand is usually for the best of everything, thereby keeping taste in the proper state of cultivation. City folks, it appears, would rather pay two dollars per bushel for apples in January than to get the bushel for the picking in October. That is our way of living. The citizen who wants a crate of Rocky Ford melons or a box of California oranges does not depend on the producer, but on his dealer, the middleman, who makes the purchases, transports the shipment in a refrigerator car or a fast freight and deposits it on the customer's back porch as fresh as when it was picked. The cost of high living must necessarily be high; there is no escape from it; the demand for comfort and luxury is universal, and the bill must be paid.

A large part of the difference in the price received by the grower and that paid by the consumer is accounted for in the service that is demanded. The consumer has led the middleman along and has kept exacting additional duties, necessitating additional cost in doing business. The cost of labor has increased, rents and taxes have gone up —in fact every item used in the conduct of the business has increased. Worthy of mention, also, is the fact that during the last few years there has been an epidemic of freak legislation for the regulation of the sale of farm products. There is no doubt about the imposition of many of these new requirements having increased the cost in operation, and thereby further widening the gap in prices paid by the consumer and those received by the grower. The big markets of the country are swarming with food inspectors, health inspectors and Federal and State sinecurists who draw big salaries.

Supplanting the middleman is a subject of general interest. Especially as Governor McGovern has given it emphasis, with his commission bill and the message he sent along with it. At this time it will probably not be amiss to define him. He has been denounced as a parasite and his elimination has at times been demanded. Let us first study him, and examine his relations to the shipper and to the consumer and see whether he is not a man, like the rest of us, neither better nor worse than we, and whether he is not performing a useful service, and doing it better than can the grower, himself, and therefore entitled to his place in the economic scheme of our organization. If, after we have made a thorough study of the subject, it appears that he is a superfluous middleman, then the superfluous has no justification for existence, and should be eliminated.

"What is a middleman?" The United States department of agriculture (Report No. 98) describes him thus: "In addition to finding purchasers for commodities on the market, securing goods for persons intending to buy, attending to transportation and storage, and making and transmitting collections of money, the functions of a middleman may include also the collection of small lots to make a carload, shipload, or other large unit desired by a certain buyer or class of buyers; and likewise the middleman may serve to distribute a large consignment to many purchasers. A carload of berries is too much for an average retail merchant to handle; it is generally necessary to secure a number of such buyers in order to dispose of a car of such produce. On the other hand, the trade in fruit, as in many other farm products, is conducted over such a vast extent of territory and in such large quantities that it has become necessary for most of the individual consignments to be of considerable size. Freight rates and conditions of freight service make it almost necessary that shipments of most farm products be made in car lots. Hence the double service of collecting small consignments into carloads and of distributing carloads among many buyers, has become a necessary part of the present system of distribution."

With reference to the "Elimination of the Middleman" the government report says.

"Coöperative marketing does not necessarily, and in fact, often does not, eliminate any middleman in the process of distribution. It often happens that when the middleman is eliminated by an asociation his services are performed by the association itself. There has been a transfer of service, from one to another, but no discontinuance of the service."

If growers are to coöperate in the marketing of their produce where it is most wanted, at the moment, and will not only bring the best prices, but will serve its purpose with least waste, then some growers must become expert enough in such matters to fill the place of the middleman. The middleman in the large cities, for example, finds out each day, where he can best dispose of a shipper's goods, that is, where it is wanted, but if he has a call from St. Louis or St. Paul for some article he hasn't on hand, he immediately combs his field to see if it is to be had. This is not only his business, the business by which his bread is earned, but it constitutes a suggestion of the great complex machinery of distribution.

From the foregoing then, the logical conclusion is that certain middlemen between producer and consumer are necessary economic factors, and the point to be determined is whether the middlemen now existing, are performing their function in the most economical manner, and whether producers can perform their functions at a lower cost to themselves. The writer is satisfied, from fourteen years of active service in the fruit and produce industry, that the elimination of the essential middleman is impractical and impossible, at the present stage of social and economic development. In his judgment, the essential middleman in the fruit trade, other than the associations and

sales organizations of the producers themselves, are the wholesale fruit merchants and the retail fruit merchants. For years the question of the elimination of the jobber has troubled manufacturers of every sort of commodity; the brightest minds in the country have wrestled with the problem; millions of dollars have been spent in experimenting to that end, and in the vast majority of cases, it has been proven, to the complete satisfaction of those concerned, that the jobber has a clear title to his economic existence, because of his ability to perform his function, spread as it is over a multitude of productions, more cheaply than the manufacturers or producers of those separate commodities could perform it individually. There have been a few producers who have found it possible to eliminate the jobber economically; but there have been especial reasons for these exceptions. Everyone of them have been based on a commodity which is consumed in great quantities by the masses, and which has an all-the-year-round sale. Even with these conditions in their favor, the elimination of the jobber has involved the expenditure of huge sums of money, for where the jobber is eliminated, the producer must replace his service; the building of warehouses in every city; the maintenance of warehouse and office forces at every point; the extension of credits to the retail trade; which in itself is a giant undertaking, the maintenance of delivery equipment, etc. It is perfectly manifest that no such undertaking is practical in the case of the grower of perishables, for many reasons, but one is enough, viz: his is a season commodity; his is a six months business, and the economic waste involved in the attempt to replace the jobbers' facilities by his own would be unthinkable.

Probably more blame is put on the middleman than on anybody else. The public thinks that the middlemen form one big combine. The public does not know that each middleman sends out forty or fifty telegrams a day when an article becomes scarce, and each house tries to secure from the others where it can, the coveted article. The public does not know the risk the middleman runs in having goods shipped long distances in either hot or freezing weather. Those familiar with the business of distribution know that out of every five deals the middleman goes into, two of them go wrong, and cause a financial loss. If middlemen would not hit it right three times out of five they would be unable to pay their railroad bills, cost of goods and make a living profit out of their hard work. There are at times reports that middlemen would rather dump goods they had received than sell at a low price. This, of course, is all a mistake.

It is true that there is more or less speculating done in food commodities, but this is no more general than in any other line of merchandise. A middleman visits various sections at stated seasons and buys stock for consumption during the time of non-production. If this did not occur there would be waste during the period of overproduction and the producer without an outlet would be forced to sell at low figures or have his crops remain on his hands with no market. It is as necessary to have speculators in the produce business as it is to have large rivers drain small ones. The buying of speculators puts

new life into the grower and gives him courage to grow another crop the following year. If the farmer prospers the whole community reflects his condition. Were those who complain the loudest about the prices they are forced to pay to try and produce the goods about which they complain, a large majority would soon be silenced. The remark is often made, "that apples or other products can be bought for one-third of what they bring in the market if purchased in the country." This can be easily understood. Oftentimes goods are raised in a section to which no buyer goes as there is not enough of a certain commodity grown there to make it worth while.

Losses that the speculator sustains are seldom considered and only his profits are mentioned. Two years ago speculators made big money on onions but last year most of them lost all they made the previous season. Onions last year sold for twenty-five and thirty cents per bushel less than cost, and the consumer got the benefit. The middleman gets his entirely unwarranted. People do not know that he works sixteen to eighteen hours a day and gets less for efforts than is received from similar exertion in any other line. Most of the time he is aiding growers in getting more for their crop than actual conditions warrant.

Middlemen pay more freight to the railroads, more express charges, more telegraph bills, larger telephone bills than any other class of merchants in the country for the amount of business they do.

Ralph P. Wonnell, a middleman, who recently addressed a gathering of his kind, at Cleveland, Ohio, on "The Middleman" rid himself of the following witticisms:—

"A middleman may be a young man, an old man, or a boy of any nationality, conversant with any or all languages.

To be successful he should be physically sound and start while young in order to have a long time in which to repent or start something else.

He labors 365 days in the year, minus the Sundays only. On Sundays he sleeps, if he is not too nervous or if he is not too new in the business.

His sole purpose in life during his waking hours is to bend every effort to connect the consumer with the product of the soil. This is how the people here and there get what they want to eat when they want it, and their usual three meals a day.

In the field of production there seems to be a lot of people and considerable land covering a territory comprising the whole wide world, engaged in producing what we eat, and each individual grower sending and spreading it as far as he can reach. It is left for the middleman, however, to do the bulk of the assembling of it, and to facilitate the distribution thereof, thereby making larger production possible and profitable.

His time, money and knowledge, gained from hard knocks of experience and competition contribute to an economic solution of the problem of distribution.

His primary object in working is to do enough business; that the

total of his efforts will meet the depreciation of his equipment, keep it in running condition and repair, and give to those dependent upon him as good a living and opportunity in life equal to that enjoyed by his neighbor.

He covers all sections of the world from whence comes his supply as the seasons come and go, in order to keep the year full, to meet the requirements of the business he has drawn to himself, and which are dependent on his efforts.

He is supposed to eat and sleep like other people. The brightest of the mornings are his, and the birds bid him welcome while humanity sleeps.

He backs up his judgment with his time and money, but often fails in the collection of all that is his due, while the profit of many purchases and misplaced credits show up on the wrong side of the ledger.

Withal, he is usually congenial and accomodating to a fault, and a dispenser of practical philanthropy. His generosity reaches the producer, his fellow distributor, and he also contributes his share to the consumer when he can not come across.

To the grower he is without doubt the best friend they ever had. The modern middleman, among the most intelligent and progressive farmers wears a halo instead of a silk hat. In explanation of this statement would say that he cares little what he pays for a product, so long as it will resell at a margin.

Thus as humanity comes into existence, its wants begin, ceasing only with the obituary; the middleman comes in to serve his purpose, a product of modern civilization—a calling as legitimate as a profession or any other line of endeavor.

As the day comes between dawn and twilight, as the machinery that turns the raw wool into the finished article of apparel, the middle that connects the two ends of everything, the middleman serves his purpose.

As long as the demands of the dinner table takes in everything from the onion that comes from the region of the Nile, rich luscious grape clusters of Spain, the banana from Honduras, the mushroom from Russia, tea, coffee, and spices of other climes, together with the many and variable products of our own dear land, covering the sardine from the upper coast of Maine, the tomato of lower California, the luscious (looking) apple of the Wanatchee valley to the grape fruit of the Isle of Pines—so long will the consumer be largely dependent upon the middleman, and his ability to concentrate and supply as needed; yes, long after tariff reductions, parcels post and municipal markets have ceased ringing the charges; the high cost of living."

THE ILLINOIS WAY.

J. C. HEATON, Illinois.

The object of this paper is to tell you a few of the things Illinois has done and is doing in horticulture with special reference to apples.

I well remember about the year 1868 when the first crop of tomatoes was grown near Cobden, Illinois, and was reported to have sold on the Chicago market for $7.00 per bushel the season through. Our strawberries were selling at the same time, and for several years after at from $3.00 to $5.00 per twenty-four quart case.

For a generation or more southern Illinois had been noted for its large crops of tobacco and children, especially children. Our country was new and we were carefully feeling our way to better and more profitable crops, except children, considering them the most profitable crop grown by the Horticulturist in any clime.

When we saw the possibilities of our country in horticulture we were not slow to take advantage of them. We began in a small way to raise fruits and vegetables for the Chicago market, shipping by express at first. It was not long however until our output had become so great that we asked the railroad for a cheap, fast freight service, which they were prompt to give. This gave such an impetus to the business that we went, in one season, from wagonloads to carloads, and it was only a short time until trainloads were gathered up along the line.

To give an idea of the enormous business done along the main line of the Illinois Central in fruits and vegetables, I will here give a brief statement of the amount shipped in the year 1913 from two of the principal shipping points in the clay hills of the southern part of the state. Anna shipped—130 cars of sweet potatoes, 100 cars strawberries, 53 cars apples, and 300 cars of truck including onions, pieplant, tomatoes, melons and various products of this kind. Cobden shipped 160 cars of sweet potatoes, 55 cars of asparagus, 65 cars of pieplant, 64 cars tomatoes, 10 cars strawberries, 115 cars apples, 35 cars peaches.

The crop at these points was 50 per cent short of the average on account of the extreme drouth. Cobden alone in a good season has shipped as high as 30 cars of tomatoes in one day. Anna, one year, shipped 21 cars of strawberries in one day. While these two places are the largest shipping points in that part of the state, they are typical of many others in the same vicinity. These were solid cars and were handled by the shipping associations at each point. Beside this large quantities went from each place by express and freight in less than carloads. So much for the horticultural development of that immediate section. From the above one can see that apples are a small factor in their horticultural output.

Until about the year 1875 nearly all the apples were grown by the general farmer in his home orchard. There were few orchards of ten acres or more in the state, notwithstanding the smallness of the orchards their owners began to realize they were the most profitable part

of the farm. The only things necessary to have good apples in those days were to plant the trees and cultivate. Nature did the rest. Observing people soon saw that there was no crop so easily grown and so profitable as apples. As a result farmers who had the means began to enlarge their orchards to twenty and sometimes forty acres. When these came into bearing they were veritable mines of wealth. Apples became the general talk of the country. Everybody was telling everybody else how much money was being made in apples. It was a common thing for men to meet on the street corners or in the stores and figure out fortunes in apples, and the beauty of it all was that it cost practically nothing to grow them. Just plant the trees, wait a few years and reap a golden harvest. They figured that if one tree would produce twenty bushels, which is a conservative estimate for a full grown Ben Davis, fifty trees would produce a thousand bushels which at $1.00 per bushel would bring $1,000 an acre. Allowing one third off for harvesting and marketing there would be left $666.00 per acre net profit each year. In those days there was no such thing as a crop failure consequently there were no allowances made on that score. Such figuring was in harmony with conditions and results at that time, and was so reasonable that not only farmers but everybody who had the "get rich quick" desire went into the apple business. "The butcher, the baker, the candle stick maker," professional men, bachelors, widows and old maids, all, everybody who could raise the money began to plant orchards. Bankers and money lenders made liberal loans to those who desired to plant but had no money to buy trees. Everybody seemed to have been bitten by the apple microbe and was wild to lend a hand in developing the business.

In Clay county twenty thousand acres were planted, with Richland, Marion, and Wayne closely following in the order named. In one place in what is known as the apple belt of the state, along one public highway there are twelve continuous miles of apple orchards, mostly Ben Davis. Large bodies were planted in different sections throughout the south half of the state. The owners were happy in the thought of the rich harvests that awaited them.

These orchards were cared for as only an enthusiast will care for a thing on which he has set his heart. The first crop came and the fruit was fine, fulfilling the expectations of the most hopeful, except that the large blocks, all of one variety, were a little shy all through the center. The second and third crops were about the same.

All this time nothing was being done to control the insects and fungous diseases. Such large areas of orchard soon became prolific breeding grounds for these pests, and the orchards began to fail. In a few years they quit and most of them stayed quit. The experiment station sent out men to investigate. First they found large blocks of trees, sometimes twenty to forty acres, all one variety and as a result pollination was weak. To remedy this they recommended that every fifth or sixth row be taken out and some good pollen bearing variety planted in its place, or better, that the trees in these rows be cut back and topworked to some strong pollenizer. This to be followed with two or

more applications of Bordeaux and Paris green at stated intervals, that being the standard spray at that time. Only a few had the courage to take this advice. The majority preferred to trust to luck and await developments.

Up to this time the only enemy of the apple known in our country was the codling moth, which had always been with us. Later we learned of the apple scab, blotch, bitter rot, and curculio, either of which may of itself cause failure of the crop if not controlled by spraying.

This was so discouraging to those who had planted for speculation that they turned their attention to more congenial occupations and left their orchards to take care of themselves.

As a result they produced nothing better than evaporator and cider stock. But out of all this failure and ruin there were a few who were not quitters, who had the courage of their first convictions, and were determined to do all that was possible to be done while there was a ray of hope. Our Experiment Station offered them help in this time of gloom, which they were prompt to accept. Every one who followed the instructions of the station was rewarded with bountiful crops, and soon felt themselves on the highroad to prosperity.

As season after season went by and the sprayed orchards produced good crops, other growers fell into line and obtained similar results.

About this time some of our shrewd, farseeing growers conceived the idea of forming a company to lease a lot of these neglected orchards and take an option on them for their purchase at the expiration of a five-year lease. All those orchards were taken over by the company and are now paying liberal dividends to the shareholders.

Apple growing in Illinois at the present time is a business that to succeed must be conducted on scientific principles. To grow first class winter apples one must spray from tree to five times, as weather conditions may require. As this spraying must be done at the same time that much of the spring work comes onto the general farmer, and the equipment necessary to the successful handling of the orchard and its product is very expensive, and of little or no value in any other line of farmwork, the apple business is rapidly going into the hands of men who like the work and are making it their speciality.

I will give a few examples of the specializing being done: Senator H. M. Dunlap of Savoy, Illinois, has one hundred twenty acres on his home farm from which he harvested in 1913 twenty thousand barrels of apples, besides several carloads of cider and evaporator stock. In addition to this he has under his control one thousand twenty-five acres of apple orchard belonging to the Illinois Orchard Company of which he is president and business manager. These were the neglected orchards referred to above, which were leased on five years trial and which proved so successful that they were bought at the expiration of the leases and became the property of the company. Under Senator Dunlap's management these orchards have paid for themselves, paid for up-to-date equipment for handling them, and are now paying fat dividends on the investment.

J. M. Tanner of Springfield, Ill., has two hundred-eighty acres of apples, thirty acres of peaches, and one hundred acres of pears in bear-

ing. Eighty acres of apples and thirty acres of peaches in young orchard. The year 1913 being an off year with his pear orchard and about half of his apples, he shipped only six carloads of pears, four thousand bushels of peaches and ten thousand barrels of apples. One four acre block produced six hundred barrels of apples.

Lest I make this paper too lengthy I will briefly mention some of the men and women who are making a speciality of the apple business and are making a success of it.

The Perrine Brothers of Centralia have two hundred acres, H. M. Simpson & Sons of Vincennes, Ind., own and successfully operate two hundred or more acres in Illinois. Messrs. Ringhausen, Motaz and many others of Calhoun county have each a large acreage. Guy Beauman of Tunnel Hill, Mrs. McEvoy of New Burnside and F. B. Hines of Ozark have about one hundred acres each. Mr. Poff and Mrs. J. F. Jolly of Olney, Lamar Bros. of Cobden, Casper Bros. of Anna, and many others over the south half of the state are all making good, and are enjoying many of the luxuries of life made possible by their orchards.

The apple man who succeeds in Illinois to-day must either know his business throughly or be able and willing to follow, without question or doubt, the instructions of some one who does know it. He must be a man who can work and live by faith and never figure the expense until the end of the season, for if he counts expenses he may become discouraged and throw up the job, quiting on the eve of success and losing out entirely.

While it is true that it is an expensive job to raise good apples in Illinois, it is also true that they pay an enormous profit and any man with ordinary intelligence, with get up and go in him, and a willingness to follow the instructions of the Horticultural department of the University of Illinois, can succeed in equal measure with any other line of agriculture.

As reference is so often made in this paper to southern Illinois, in speaking of our apple orchards, it might be well to explain that about nine tenths of the apples grown in the state are grown in the south half, on the clayhills and gray prairie land. The vegetables and small fruits grown for distant markets are mostly grown in the clay hills of the extreme southern part of the state.

HOW WE RAISE FRUIT IN IOWA.

WESLEY GREENE, Davenport.

The topic assigned to me by your secretary is an affirmative and descriptive proposition that we must condense to bring within the limits of the program, and by doing so we can only touch a few of the high places, and give you as it were, a bird's-eye view of the situation.

Before telling you how we grow fruit it may help you to understand the proposition if we indicate what fruits are grown and where cultivated.

The climatological conditions of Iowa are somewhat different from those in Wisconsin, being only remotely effected by lake temperatures or moisture. Geographically Iowa is situated between the two great rivers of the intercontinental region; it is 275 miles long east and west and about 200 miles wide north and south, and covers 55,000 square miles. Iowa is really a great hill, one thousand feet high with a slope so gradual that you are scarcely conscious of the ascent in crossing it. At Keokuk, the southeastern corner, the elevation is 494 feet above the Gulf of Mexico, at the southwest corner it is 918 feet, at the northwest corner it is 1350 feet, and at the northeast corner 648 feet so that on the whole the state has a southeast exposure. From the Minnesota line there is an elevated, wedge-shaped plateau 1200 to 1500 feet above the Gulf, extending south to the Missouri line, the northern half of which is quite level, known as the Wisconsin drift, and contains a number of small lakes.

The precipitation ranges from 28 inches in the northwest corner to 42 in the southeast, at Keokuk. About 15 per cent of the total area of the state was covered by forest trees, mostly confined to the eastern and southern parts. The planting of groves has increased this since settlement began to about one-seventh of the total area. Of the 200,000 farms in the state 150,000 are growing fruit; about one farm in four is without fruit. The average size of these orchards is about an acre. The farm orchard from a commercial view point is a problem not yet solved. Not more than twenty per cent of the trees in the farm orchards have been sprayed, and a very large part of the fruit in the unsprayed orchards is not marketable on account of the poor condition in which it is offered to the trade. If the farm orchard is to be a source of revenue in the future, better methods of culture and care must be introduced than prevail in them at present. The commercial orchard planted and taken care of in a systematic, business like manner is a profitable investment in Iowa. Since the first orchard was planted at Montrose by Louis Honore Tesson, an Indian trader in 1799, the Iowa orchardists have been testing varieties, but that phase of the problem is not so urgent now as formerly; the tendency now is to plant only a few of the best sorts, and to give these the care necessary to secure good results.

Strawberries are grown over the entire state commercially in a small way; matted rows four feet asunder, mulched with straw for winter protection and to keep the fruit clean, is the usual practice. Two crops are gathered before the plants are turned under, though some intensive growers still believe in the single crop rotation. Warfield and Senator Dunlap are the standard varieties. We have two experts in strawberry culture in the State who are working with the everbearing sorts, and you may hear more of these later, but they are not yet a commercial proposition on a large scale. Currants are a success throughout the state; also gooseberries, except the English or European sorts, which mildew badly and are not planted to any extent. The leading varieties are Houghton and Downing; perhaps you would substitute Pearl as an improved Downing.

Blackberries are an uncertain crop on account of drought at the fruiting season. Snyder is the standard variety for general planting, though more tender sorts are grown in the southeastern section. Black and Red raspberries receive considerable attention, are a little tender in the northwestern part. Older is the hardiest of the Blackcaps, but poor in color. Kansas, Gregg and Cumberland, are leading sorts among the Black-caps. Culbert, Marlboro and Columbia or Columbian as some call it, are the red varieties. The red berries bring a higher price on the market but are not considered as profitable as tne blackcaps; they are grown by hedgerow method. A few growers use a wire trellis for black-caps.

Grapes are grown over the southern two-thirds of the state, and do remarkably well on the loose bluff soils along the Missouri and Mississippi rivers. We have some excellent grape soil in Iowa and grape culture will in the near future be one of the leading fruit crops. Commercial varieties are Concord and Moore's Early.

Peaches are only grown commercially in the southern tier of counties and on the west along the river bluffs as far north as Council Bluffs, and on the east up to Davenport. On the northern limits are grown only hardy seedlings, that have very little commercial value except in the local markets. The Domestic and Japanese plums are confined nearly to the same district as the peach; the trees are a little more hardy, but the fruit is usually badly affected by fungous diseases that makes the crop an uncertain one for profit. The Americana plums are grown in all sections of the state, but do not ship well in large packages and as they are used only as culinary fruit the distant markets have not given a profit. If the plum industry is to increase, the fruit must be sold as a manufactural product to extend the time for distribution. De Soto and Wyant are the leading varieties in Iowa.

Sweet cherries are not a success. Sour cherries are planted as far north as Dubuque and Sioux City in commercial orchards. The varieties are Early Richmond and Montmorency. English Morello has suffered severly from fungous diseases the last ten years and there are not as many planted in recent years as formerly, though it extends the season for marketing cherries.

Pears have not done well with us; blight is the great enemy of the pear on our rich soils. When planted on the poorest clay hills the

trees are better able to resist the disease than when growing in richer ground. We have a few commercial pear orchards in the south half of the state that give some encouragement to pear culture for profit.

The apple is the most important of the tree fruits. We have about 6,000,000 trees in bearing which yield from three to ten million bushels annually. This year the crop was about six million bushels, one-third of which was not marketed on account of poor quality. Two million were used locally and the other two million went into the general trade. The commercial orchardists are now putting their orchards on a paying basis. We have only a few large commercial orchards that exceed 160 acres in extent. At one time there was an orchard of over 900 acres, but it has long since been divided into smaller holdings. The standard varieties now include only a half dozen of the leading sorts. We have Yellow Transparent for first early on the local market or short shipment, for it is a tender variety that will not bear rough handling and Oldenburg for the early market. These two varieties are planted generally over most of the state. Wealthy is the market apple for the northern half of the state and Jonathan for the southern half. The Northwestern Greening has been planted largely in the northern half of the State to supplement the Wealthy and extend the season. In the south half a member of the Ben Davis family is planted on account of its commercial qualities:—size, color, productiveness, long keeping, and immunity from injury by rough handling. We have other varieties of merit such as Grimes, Stayman, York Imperial, Delicious, Fameuse, etc., for second and third choice to extend the season for harvesting the crop.

The essentials in the management of a commercial orchard are: Plant good healthy stock, cultivate well, and incidentally grow corn or hoed crops in the orchard to pay cost of cultivation; prune the trees to form low open heads to admit light and spray mixtures. The spraying should be thorough so that every part of the tree is covered with the mixture; not less than three applications should be given. The most important spray is the one given just before the bloom opens, and the next one as soon as the bloom is off, before the calyxes close. We have not found any fungicide that gives as good protection from the attacks of fungous diseases as Bordeaux, though lime-sulphur has many friends and has often given satisfactory results. Arsenate of lead is used almost exclusively to destroy insects which eat the foliage and fruit.

It will pay to thin fruit when more has set than the tree can bear or mature properly. The crop should be carefully picked, graded to size and color and put in clean packages.

Most of the apples are packed in barrels, though the box has come to stay, and the carton will soon find a place for fancy stock. The fruit grower who is thoroughly in earnest and puts into practice the best methods of *caring for* and *disposing of* his crops will receive an abundant reward for his labor. It is the careless fellow who loses his fruit on the market when the supply is greater than the demand for it. Good fruit will always sell at the highest price, *good enough—never*

leads to success—it must be the best. If your fruit is not the best on the market learn the reason why it is not, and prevent such a mistake in the future. The successful fruit grower always has more customers who want his fruit than he can supply. Be one of that kind and you do not need to "worry" about prices or a market.

EAT MINNESOTA APPLES.

PROF. R. S. MACKINTOSH, Minnesota.

"Eat Minnesota Apples" was the slogan we started for the purpose of calling attention to the fact that Minnesota was producing the finest quality of apples and that we want to interest the city folks in using them, so that the farmers would not have to use them in their rations for hogs. One man said he had fed a bushel of apples and a bushel of corn to his hogs, it was a "balanced ration." This was a slogan started for the purpose of calling attention to the fact that Minnesota is now producing apples. We are not in the commercial apple industry at present, because we have been passing through the experimental stage, just the same as you have been, talking about the ever-bearing strawberry. Everything must go through an experimental stage. You must get some persons interested in the planting and growing of the fruit before you can put it on the map as a commercial product. We have had the ginseng industry developed, and I made the remark not long ago, that it is something like the Belgian hare. A man spoke up "Do you put those two in the same basket?" I said "No." But in that region the cultivation of ginseng has been made a success. I have heard in other parts of very disastrous results to folks going into ginseng. So we must experiment through a series of years; some year frost may kill the ever-bearing strawberry and drought may in another, just the same as our spring bearing strawberries. It must go through the period of experimentation, just as the apple in Minnesota. In Minnesota we are on the map as producing apples in the home orchard. This fall I had the pleasure of riding about a thousand miles in an automobile in the western part of Minnesota, across the wide prairies and going in behind windbrakes, finding apple trees loaded with fruit. Folks were wrought up over the question of the blight, they did not know what it meant, so it was part of my duty to go around and tell our agricultural agents what the blight was. I went into an orchard where they had some trees and they had read in some of our papers or bulletins that blight should be cut out. One man sent his hired man to the orchard and he did cut out the blight, great big limbs as large as my arm were cut off, the last of July, or first of August, there was hardly a leaf left on those trees, and the poor wife was heartbroken. I tried to tell her as quietly as I could that they would have to wait until next spring to see whether the trees would survive the ordeal. We have such extreme

cases coming up and we have to be very careful in giving directions in caring for our trees. We are passing in Minnesota between the era of the commercial orchard as a distinct proposition from the home or farm orchard. We want to produce enough apples for our home use and we are doing it at present. The Minnesota State Horticultural Society is a "little" society; we have about three thousand members and we have a meeting just the same as you folks do. Last night you had your "best meeting" and so we had a "best" meeting by the woman's auxiliary in Minnesota. Some of the folks did not attend, but they found out afterwards that they missed a fine program. I should like to say for the benefit of the lady, who last night was discussing on this platform the subject of trying to distinguish between agriculture and horticulture, that it is very hard to separate one from the other, so you need not be afraid of teaching one or the other.

I want to say just a little about our educational work in Minnesota; it, I believe, stands at the head in many ways. We have, of course, the common school, district school, township school, and we are trying to consolidate as fast as we can, but one of the movements which has spread in Minnesota like wildfire, is the teaching of agriculture, home economics and manual training in our high schools. At the present time, we have one hundred and forty or more young men, college graduates, who are teaching agriculture in the high school. It is part of the regular curricula. The State gives from $1800 to $2500 to each of these schools depending upon the grade of work given. Now, we are going to hear from them in a few years to come because the graduates of our high schools are going to know something about the things surrounding them and not about things that happened ages in the past. We are finding out that the study of things surrounding us at the present time are the things we want to know, so that when our friend, Mr. Hill, criticises the school system, we can show that the folks know something about the things surrounding them.

Then we have, of course, the University of Minnesota, and a friend whom I was talking with last night wanted to know how many students we had up there. I presume it was to try to find out whether the University of Wisconsin had more students than the University of Minnesota. That is not the question. We want to know that we are doing something. Now, we in Minnesota have a College of Agriculture the same as you have and then we have agricultural, or we call them technological schools, or schools of six months each. Minnesota was the leader in starting this type of schools where the boys are collected during the six months of winter, or dormant period, giving them instructions as to why we farm in certain ways, then they go back to the farms. That school has been the forerunner of many others in this country. At the present time we have three of them. We are doing a large amount of work, as I mentioned a little while ago, in having county agricultural agents in counties in various parts of the State. We have twenty-three or twenty-four of them that are working at the

present time. These men have automobiles and they go from place to place assisting the farmers in doing work connected with their farms and it is surprising for one to know that just a little while ago in one section of the state, the West Central Development association had purchased over three carloads of alfalfa seed. That means something. Farmers are beginning to take notice that alfalfa and some of those crops must be worked into their farm operations.

I represent another branch of our educational system, the Agricultural Extension Service. We have a division which has charge of these County Agricultural agents, the Farmers' Institutes and our Extension service. We have at the present time, this week, four short courses in progress in this Extension work. It means work away from the campus and we have a carload of stock at three of these and the experts are at the present time talking to the farmers about the agricultural crops of their vicinity. We are doing a great deal in this work of stimulating the growing of acres of corn by the boys and the baking of bread by the girls.

Our Minnesota Horticultural Society is offering a great many prizes, $1,000 for a winter apple, and it is now putting up prizes of $600 for the best acre apple orchards. These are to be planted this spring under certain regulations and shall consist largely of Wealthy apples. The Wealthy apple, as you know, is a Minnesota product, so that Minnesota is on the map in that way, and if you are over there when there are plenty of apples, I hope you will eat Minnesota apples.

SOCIAL CENTERS FOR HORTICULTURISTS.

WM. TOOLE SR.

I have chosen to transpose the title of the subject assigned me, and have it read, Horticulturists for Social Center Work, for I believe the average horticulturist, because of temperament, training, association and environment, is pre-eminently fitted to promote social center work in rural districts, to aid in the formation of clubs or other societies, to help advance the rural life of various communities, to more sociable, enjoyable, and profitable conditions. We older members of the Wisconsin State Horticultural Society, have pleasant recollections of various local societies, which our state society has helped to establish, or sustain and strengthen. The present strength of our state society comes largely from localities where these local societies have existed. How many of these societies now exist we do not know because their connection with the state society is not kept up in any way, that gives an opportunity for knowledge of their present activities. Reports of their meetings in times past have shown that they were

occasions of social enjoyment, as well as promoters of better methods in horticultural operations, and home management. Their influence for good has not been altogether confined to strictly horticultural thought, and some of our most successful coöperative organizations have been an outgrowth of these earlier horticultural societies. It is probable that many of these societies have ceased to exist because they strove to confine their helpful activities within strictly horticultural lines of thought. There are but few neighborhood communities of size large enough to sustain an active rural organization with thoughts altogether centered on horticulture, and there are none which do not have a considerable interest in all the various influences, which concern the mutual welfare of the average rural community.

There is so much interest shown in rural social center work, and so much is written in its favor that it sems almost superfluous to offer any arguments in favor of the desirability of encouraging country residents to get together in a social helpful way for mutual enjoyment and profit. I think, however, it will not be out of place to give some thought to the good influences which we have seen resulting from well organized farmers clubs and kindred societies. Any club which has been really successful, and has established a permanent existence, has been controlled by certain lines of thought or policy. First we may mention, seeking for the best—the best that members know, the best that they can do, the best way to do things, and the best that should be done. Through this seeking for the best, neighbors know more of the good qualities of each other, and value each other more highly. From this better knowledge of each other is developed a greater inclination to coöperate for the good of all. Through the better acquaintance that is promoted by these clubs, neighborly interest and sympathy are increased and strengthened. The literary training given the members in calling for their best thoughts and knowledge, develops the abilities of the various individuals to express their thoughts in speech and writings. The bringing together of young and old of both sexes, which prevails in any well organized farmers culb, develops a feeling of comradeship which adds much to the enjoyment of the community.

Members of newly organized clubs may have a feeling of a need for help from outside, but as soon as possible the custom should be established of doing things for ourselves and others, rather than having things done for us. It is well occasionally to have someone from outside to talk on some special subject, but we can and should depend largely on our own members to look up and present the various subjects which should come before the club for discussion. Not only will it be a surprise to the members of the club collectively, when they realize the amount of talent of the various members, but also in many cases the individuals themselves will be surprised on discovering their own abilities. The life of a club depends largely on its social features, but the strength and endurance depend on beneficial activities. There are so many good causes that may be helped by a rural club, that—"For the good of others"—should be a leading motive. There must be leaders in the social center work. It may as well be you. If you find a little senti-

ment in the neighborhood in favor of the movement, call a meeting of those interested and organize. Others will join as soon as they see that it succeeds. The first meeting may well be at some residence, and if the plan is acceptable to a majority, the club may continue to use the members homes as social centers. The Skillet Creek Farmers Club has held its meetings at the homes of members for more than eight years, and the members like the plan. Some clubs use the district schoolhouses as meeting places, but schoolhouses generally are not conveniently arranged for such gatherings. When clubs are very large a social center building becomes a necessity. In the town of Fairfield, Sauk county, the Klover Klub is uniting with the town in erecting a combined town hall and social center building. The Sauk Prairie Club makes use of the Sumpter Town Hall, and the Websters Prairie Club has fitted up a building for their meetings.

For the sake of being orthodox a constitution and by-laws should be adopted at the time of organization; but make them as simple as possible, for after the club has got well in motion the constitution will be scarcely thought of. Programs should be varied in character, but a general plan of meetings should be adopted.

The following is an outline of a recent meeting: Call to order, music, roll call, reading minutes of previous meeting, report of the canvassing committee on coöperative laundry, discussion, statement of necessary equipment for coöperative laundry, discussions, music, visiting intermission, music, report of the committee on securing electric light and power from the Wisconsin River Power Co., announcements, music, dismissal. Note the visiting intermission. We visit some when assembling and again at the close of the meeting, but for hearty joyful visiting you should share in one of our visiting intermissions. We never need refreshments to promote sociability yet we have refreshments occasionally. Our December 18 meeting was our annual corn show. Cake and candy also competed for premiums. A full program including visiting intermission was carried out, and to close there was a feast of cake and candy. A winter picnic will be enjoyed at a member's home this present month. The program of the meeting held January 2nd, was rendered by some of the pupils of three districts under the direction of one of the teachers. For several of the meetings to be held this winter, different members have been appointed to each plan a program and conduct a meeting. No two of these leaders is permitted to use the same person on a program. The officers of this club are a President, Vice President, Sec.-Treas., and two advisory members. These constitute the executive committee and have charge of the general plans of the club. It is aimed through committee work or taking part in programs for all to have some share of the clubs movements. Meetings are held every two weeks in the winter and monthly during the summer time. We have a picnic in summer of course and a strawberry festival and an ice cream social in season. The get-together spirit has increased in Sauk county during late years and it seemed desirable to organize a County Country Life association. This association brings together at its winter meetings

by delegate membership, Farmers Clubs, Literary Societies, Teachers Associations, Womens Circles, Coöperative Organizations, Rural Church and Sunday Schools, Old Settlers Societies, and the Bachelors Clubs. A director is chosen for each class of societies and they with the other officers constitute the executive committee. The attendance has been large at the winter convention and very large at the annual picnic. The next annual winter meeting will be in Baraboo on January 23 and 24. The following subjects will be considered; Farm Home Conveniences; Organized Coöperation in Sauk county; The Farmers Daughters; The Church and Rural Life; The Old Time District School; Present and Future of our Rural Schools; School Laws; Recreation in School and Home; White Grubs and Cut Worms; Alfalfa, A School Study; What the High School Should do For the Farmers Boy; The Farmers Interest in Good Government; Transportation from the Producer to the Consumer; Handling the Apple Crop. On Friday evening will be given a sample of class work of one of our country schools, and an address by Dean Russell. The next annual picnic will be at Devils Lake the last Saturday in July. The organization of this association has greatly promoted the extension of social center work.

CITY GARDENS.

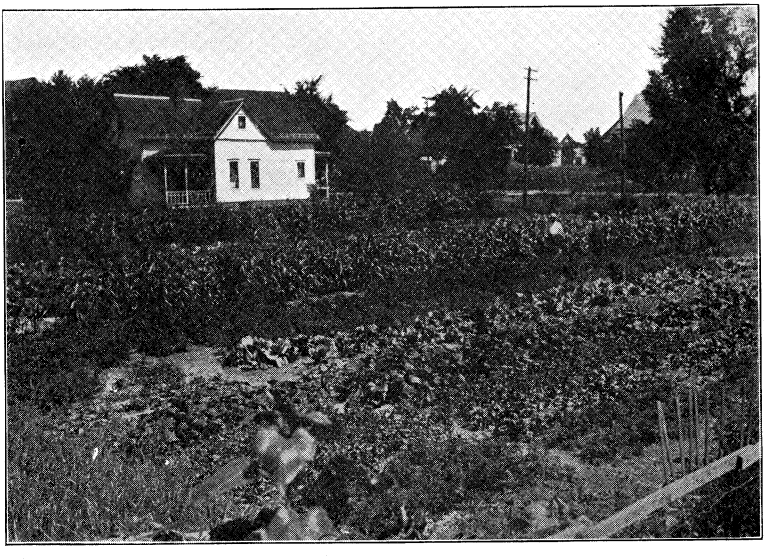
MRS. L. E. REBER, Madison.

For many years the Woman's Club of Madison has been effectively interested in the introduction, in the city schools, of nature study, and that practical application of nature study, home and school gardening. About four years ago a department of the Club distributed penny packages of seeds in the Ward schools as an incentive to the making of home gardens and at this time Miss Martha Riley, then principal of the Lapham School, started Madison's first school garden.

The penny packets of flower and vegetable seeds distributed were too few for Madison's thousands of school children, but a small beginning was made in home gardening. The teachers reported that the work was worth while, flowers bloomed, they said, where except for the children's efforts there was no beauty in the surroundings. Instances were told of children whose only opportunity for gardening was in hard stony ground, who carried rich black loam from a considerable distance in little carts or in baskets in order to give their seeds the sort of soil "teacher" said they must have.

During the fall, school desks were decorated with flowers grown by the children and several exhibits of flowers and vegetables helped to stimulate interest. The planting, the growth, and the fruition were made the subject of essays in the English work of the pupils, with some valuable, some lovely, and some funny results. One small boy who had neglected to plant his seeds at all (possibly he was one of

A group of Madison "city gardens." This was tough June grass sod, 50 yrs. growth, just a few weeks before this picture was taken.



"Waste places made beautiful." Madison city gardens, 1913.

those who received no seeds) marked his essay "Imaginary" and wrote a minute description of his experiences, from the preparation of the soil to the proud day when he "carried large bouquets of fragrant sweet peas to sick friends and aged neighbors",—so realistic and accurate a little story as to prove, at least, that he had made good use of his ears.

No prizes were offered at this time and there was no regular supervision that followed the children to their homes, so in very many cases there was even less result from the effort than in that of the boy who used his ears to such good advantage.

On the other hand, the Lapham School garden may be looked upon as a more genuinely constructive step in the progress toward garden study and practice in connection with Madison schools. This was an example of a school garden on the school grounds. An unsightly and abandoned driveway was dressed with a top soil of good earth, supplied by the city, and on Arbor Day the children came to school in workday dress instead of holiday array, bringing with them such tools as they could.

Instead of reciting verses and reading essays about the beauties of nature and the joys of planting and reaping, they prepared the soil and each grade started the cultivation of a plot assigned to it. Here was a small school garden conducted under almost ideal conditions,—close to the school, supervised by the school teachers and so intimately related to the school work that its practice hours were adjusted as a part of the schedule. Here the tiniest as well as the largest children could garden safely and always under wise direction,—and this, of course, is as it should be since gardening is a form of Manual Training that may begin to advantage in the earliest grades. (Who does not love the story of the small girl, little more than a baby, who learned to sow seeds and tend them and who so valued the growing things that she carefully replanted the weeds pulled up by her mother, in the very nicest flower bed of all?)

Miss Riley found her school garden a valuable aid in many ways. There are always in every school a few children, sometimes more than a few, who seem to present an unsolvable problem but who can be reached through some form of outdoor activity. Often the playground supplies the clue and sometimes, perhaps frequently, the garden may. A majority of the Lapham school children were interested in and enjoyed their garden; a few of them discovered an occupation for which they cared more than for anything else. This I believe always happens in a well conducted school garden, and if there were no other value in gardening as a part of school work, this alone would recommend it, since boys and girls, especially if they leave school early, so easily drift into employment adapted neither to their abilities nor to their tastes.

I am spending much time in telling about Madison's first real experiment of this nature, for the reason that, though conditions may differ, much the same things may be said in general about all school gardens and speaking of general aspects of the problem brings us to

that most fundamental of all, the problem of money. It is probable that all public garden activity has been started with the handicap of limited funds. Lapham school garden was washed away in the course of a couple years, with its top dressing of good soil. Some day, perhaps, when there is more money, the old driveway, which is very stony ground, may be dug up and enough good soil supplied to make a permanent garden,—just for the littlest children and as a supplement to a larger and more practical garden, not far away, for the older boys and girls. By that time, let us hope, that the garden training both in practice and theory will have become a scheduled part of all school instruction.

A second time the following year, seeds (this time in larger quantities) were distributed in the schools. An effort was made to give illustrated lectures on methods of planting and results, showing of course some striking cases of yards before and after treatment.

The crowds too great for accommodation in an ordinary schoolroom, the blackness of the night that prevailed when the lantern refused to work, and the failure to bring out an audience when the entertainment was staged in a large central auditorium,—these and other experiences would make a story in themselves, and this story need not be dwelt upon, since, except in the most favored places, it is common experience. But, and I believe this also is common experience, the effort was not wholly lost. Many school children that year bought seeds in addition to those given them for home planting, and thousands of little home plots each bearing one or two varieties of flowers or vegetables were lovingly tended by children of all ages.

In the spring of 1912, a group of women, one a gardener, an enthusiast, who believes that in the garden lies the solution of many problems of health, of lowered cost of living and of happiness, (in happiness she includes good behavior) another woman whose study of the Madison schools had caused her to feel a keen interest in their progress, the president of the Woman's Club and several members of the Departments of Education and Social Service met to consider the feasibility of organizing a permanent garden association, for the purpose of furthering economic gardening for adults and garden training for children. Following this conference, ways and means were considered by a committee. One of the meetings brought together several experts in the organization and managemnt of school and family gardens, also the Secretary and other members of the Associated Charities. It was learned from the experienced that there were at least three requisites, if the work were to become genuinely constructive, progressive, and permanent: namely, a definite organization; a trained supervisor, giving all of his time for at least six months of each year; and an assured income. These requirements seemed almost prohibitive.

In the meantime a circular letter had been sent to the officers of the social centers in each ward of the city with the result that offers of vacant land for garden use had been received, and two appeals had come in,—one for assistance in finding ground for and making a garden for Brayton School and one from the Secretary of the Associated Charities, who pled for an organization that would include in

its activities the promotion of family gardens as affording an opportunity of relief of the greatest value.

So rather to the surprise of all, it was decided to begin the work without at least one of the requisites, the paid supervisor.

The City Garden Association of Madison, was formed with an initial membership of eleven members, the dues being fixed at $1.00 a year. The officers of this association during the first year were all women, and the membership grew to the number of 35, giving an assured income of $35.00. The Woman's Club appropriated $15. A small beginning, but the work was started.

The purposes of the association as formulated were to interest families in gardening, utilize vacant lots, establish school gardens, and organize ward improvement work. Although it was impossible to afford a supervisor for the work as a whole, University students taking the garden training could be employed by the hour, so it was decided to offer instruction to garden applicants as well as plots of ground prepared for use.

Beside the school children, roughly speaking, two classes of persons may be greatly benefited by this activity; the very poor who may need regeneration as well as relief, and a large number of families who do not garden because they have no land. During the first year, families from both classes were given the opportunity to garden. Families and children were enrolled under the supervision of Miss Blanchard Harper on land just on the edge of the city. These were serviceable plots 45 x 45 and 45 x 60 and the harvests were large. Miss Harper taught those who needed this instruction how to preserve and store vegetables for the winter, and quantities of products were used in this way.

Eight families worked under a paid instructor who met his people after work hours and on Saturdays. For families of the one class, the very poor, the instruction was an important factor. It insured regular attention to the work and profitable gardening. The young man who gave this instruction knew how to reach his pupils—met them on a friendly basis, showed them that he could give them something, yet took off his coat and dug or hoed like any other man. When his families failed to appear at the gardening hour he went and got them.

One man, with a family of seven children, a frequenter of saloons, gardened with his wife and older children, raising most of their summer food and additional tomatoes, beans, and cucumbers which the wife preserved. Through the summer and fall he kept out of the saloon, but in the winter the old habit again conquered him.

As a rule, families of the second class do not require regular instruction as do the first, but even with them a trained instructor may be of service in showing methods of intensive gardening by which a small plot will yield a large crop.

Twelve school gardens were made by the Brayton school children, each child growing a half dozen vegetables, learning all the processes of planting, cultivation, and harvesting, with many related lessons, and carrying home the products of his work. The children were enrolled by the principal of the school and a waiting list was made for

use in case of failure of any of the beginners. When vacation came with hot days, there was some difficulty in holding the class together and it was necessary to substitute from the waiting list for three delinquents. Except when the garden work is regularly scheduled as part of the school curriculum, the waiting list is almost a necessity. The interest of the children, the desire of the parents, the incentive that comes with competition, and the waiting list—these are the weapons the instructor must use vigorously to hold his class together as soon as the many distractions of vacation life begin to be felt.

Before the opening of the following season a more stable organization had been effected for the City Garden Association, a constitution adopted, a board of directors elected and a new president chosen, a man, one of a number of real estate men who had become interested in this work. During this year, 1913, eighty school garden plots were cultivated under the supervision of the City Garden Association and thirty-four University garden plots afforded a like opportunity to as many children. Including with these the boys and girls of school age who gardened with their families gives a total of 125 children who had the advantage of garden training during that season.

Needless to say, this work was not accomplished without the hearty coöperation and assistance of the Superintendent of schools and the approval of the School Board.

The membership of the Garden Association was increased during the year to about one hundred and sixty, thus giving an assured income of $160.00, from dues. A real estate company gave the use of a large tract of land and the sum of $50.00 to help along so good a cause. One seed firm presented $40.00 to the work. A Savings, Loan and Trust company offered $100.00 in savings accounts as prizes to the school gardeners. A number of real estate men found ground for garden use and other dealers contributed by giving special rates.

During this year, the sum of $300.00 was expended for plowing, fertilizing, instruction, and the purchase of seeds.

The school garden plots were large enough to yield a crop that would supply the greater part or all of the family vegetables. A border of flowers, in this case poppies, nasturtiums, and candytuft, was required. The following vegetables were planted according to the same plan in every lot,—beans, peas, onions, beets, carrots, lettuce, spinach, radishes, cucumbers, potatoes, corn, squash, and tomatoes.

It is unfortunate to express the value of the returns in terms of money, but it is one way of praising gardens to tell what a little work and thought plus soil and seed are worth in dollars and cents. A moderate estimate has placed the sum for 1913 at $1,000.00. Under the direction of a man giving his entire time to the work this sum should be considerably increased for the same number of gardens.

Many things are said in praise of Madison's school gardens in other terms than those of money—it is pleasant to record the following:

Miss Riley, former Superintendent of Lapham School, now truant officer, says: "The work has shown that well organized and supervised gardens will go a long way toward solving the problem of juvenile delinquency during the long summer vacations."

A school principal who kept in close touch with the young gardeners from her school tells of one boy who was lazy and unruly in school who loved his garden work, made good in it, and helped the little fellows. She cites three other cases of "problem" boys who were clearly better boys for having this opening for work they enjoyed. She points out especially the community of interest that grew up in this little garden group and their friendly feeling and pride not only in their own but in their companions' achievements.

The business men in a district in which a school garden group was situated report that nothing has ever been done in their part of the city that so raised the standard of the boys as the school gardens.

Residents of another district find the children decidedly more orderly and well behaved when their leisure summer hours are occupied in gardening.

Of the family work in 1913, one case at least, should be described, that of a widowed mother with three children and an old dependent relative. This mother has two boys under twelve years of age. For the sake of wholesome summer work for these boys, and as a source of income, she planted a garden. With the help of her boys, she raised vegetables for her family of five and sold produce to the amount of $80.00 and her winter's supply. Similar results, but on a smaller scale, were secured by other families.

As has already been explained, the instructors employed by the City Garden Association have been selected from University students who have taught in the state and come back to study garden work. Communities without this or some equivalent resource could, with little expense, send one or more of their teachers to take the garden work of the University Summer School and by this means, even the smaller communities might secure trained instructors in a very good place, the school. Without an instructor who really knows how to teach gardening, the work at best, will be superficial and fragmentary.

The great fault of a system of gardening that is not controlled by the school is that it must be recruited by volunteers and does not benefit the entire body of pupils. With a garden supervisor and coöperation between school and garden management, the next best thing to gardening as an organic part of the school work might be secured. The establishment of demonstration gardens in every ward with classes scheduled to visit, inspect, and listen to explanations should greatly stimulate serviceable home gardening. The results obtained in such home work might be given credit both by the school and the garden management. During the coming spring the experiment will be tried of demonstrating in the schools the planting and care of seedlings.

An effort at ward improvement was started by Miss Melissa Brown, a member of the Garden Association, who reports as follows:

"The Tenth Ward Association was organized primarily in order to interest the children in utilizing their backyards as garden spots, in working for a cleaner ward, by keeping papers picked up from the streets and around their homes, and in cutting the weeds. Also as far as possible to interest owners of vacant lots in keeping the weeds

cut. An unsightly plot of ground at the junction of Spooner and Monroe Streets was cleaned up by the Boy Scouts. They removed old barrels, rubbish, etc. making a neat little park of evergreens around a drinking fountain. Through the efforts of the Association the triangle at the entrance to Wingra Park that had long been used as a dumping ground for all kinds of refuse, was filled in and seeded down and a promise is given by the Madison Park and Pleasure Drive Association that this plot shall be planted with shrubs and flowers the coming season.

An attempt is to be made next year to remove the telegraph poles back from Spooner street near the viaduct, and to plant trees and shrubs along the railroad right-of-way, from the viaduct to the triangle making a beautiful parkway between Wingra Park and University Heights.

Last spring a generous lot of seeds was donated by a seed store for the use of the children of Tenth Ward. An effort was made to have the gardens inspected at stated intervals by several boys ranging in ages from sixteen to twenty.

Late in summer, the Tenth Ward children were asked to exhibit from their gardens in connection with the City Garden Association proper, the exhibit to be held at Vilas Park; they had not had this in view from the beginning and many of the vegetables had been used before the proposition was made, nevertheless, a few brought very creditable exhibits.

Many children who saw the display were enthusiastic in their determination to have gardens next year.

In passing, we would mention two boys who sold over $50.00 worth of truck from their garden, although they had only a small plot besides the back yard." So much for the Tenth Ward. Similar work will be organized in other wards as rapidly as possible.

The exhibit at Vilas Park mentioned by Miss Brown, gave a successful termination to the season's work. Contributions came from children's gardens from all parts of the city, and made a surprisingly good display. This was shown on Labor Day, the little school gardener's gala day, as it was then that they were taken in gaily decorated cars to inspect each other's gardens and finally to see their own exhibit under the trees of beautiful Vilas Park. Here the prizes were distributed for the best group of gardens and for the best gardens in each group, and an ice cream treat always acceptable to boys and girls was the more grateful because the day was hot and cloudless. Every gardener wore a gold-colored badge and radiated pride and pleasure in his or her summer's achievement and its happy end.

THE COMING GENERATION.

CAROLINE TRUMPF.

A few weeks ago I was asked to tell you something about the work we are doing in the country school in Agriculture, and if I thought the same kind of work could be done in Horticulture. Since the two subjects are so closely related, it is rather difficult to say where Agriculture begins and Horticulture leaves off; and I must confess that we teach Horticulture many times under the disguise of Agriculture.

Agriculture like all the other subjects of the curriculum has become so broad that I will only take up a few things we dwell upon during a school year.

The first subject we usually consider in the fall of the year is the study of the different kinds of weeds,—first, noxious and others that grow in our community. My reason for taking up weeds FIRST is because their eradication is of vital importance and can be applied to nearly every subject discussed in Agriculture that follows later. We do not study the weed that grows and blossoms in our textbooks, but we get right out into the fields surrounding our school and study the ones we find there, such as quack grass, rag weed, yellow dock, burdock, fireweed, Russian thistle, pepper grass etc. As the different types are gathered, we learn their names and bring them back to the school where we study the general character and appearance of each weed. All the samples of weeds that are gathered are *preserved* and referred to as our study of the subject continues. After the seeds mature we gather seeds of all kinds of weeds and place them in labeled bottles for future use. By the time we complete the study of weeds the pupils manifest a great deal of interest in a plant very common in their own community which they had never even noticed before. Then we are ready for the most important subject of all,—The eradication of all common and noxious weeds. Perhaps here the students show the greatest interest because here they come in contact with something that has already been experienced by them. A good many *well* remember the mornings they have spent weeding onion beds or hoeing corn when it would have been more to their liking to have played "Hide and Seek" or "Pump, Pump, Pull Away". We spend extra time on the study of the three most harmful weeds in Wisconsin, such as quack grass, Canada thistle, and wild mustard. Many times for opening exercises we have speed contests in calling out the different names of the weeds as each variety is pointed at. This stimulates their familiarity with the pests of the garden and field.

Soon after the study of weeds we take up the study of corn. About the first of October is an excellent time to study corn, because then it is mature and we have a good opportunity to consider the plant as a whole. This work is also done out in the field, and there we take up such matters as these: Why the plant should have a medium sized

leafy stalk, good root development, and different kinds of roots, such as brace roots and feeding roots; why the corn should be mature, and why the ears should be cylindrical shaped, the kernels run in straight rows with the butts and tips well filled. The color of the corn and the length of the ear are also not forgotten.

Last fall when the corn was fully mature, we got the consent of one of the farmers to let us gather some of his seed corn for him, and I can assure you the girls and boys were very careful to examine the stalk, leaves, ears, and roots before they chose the seed ear. After the corn had been gathered we took it into the schoolhouse and put it on seed corn racks to dry. In the Spring we tested it, using the individual ear test. By so doing we could determine which ears were germinating and which were not. After the corn was tested we shelled it and returned it to the farmer to plant. The report of that corn from the farmer was that he had never had such good corn before.

Of the many other subjects that we discuss in Agriculture I want to say a little about alfalfa, the "Queen" of all clovers and all other grass plants. Alfalfa is the most palatable and most nutritious of all hay crops and has the greatest yield per acre. When we took up the study of clover and grasses, our bulletin told us that clay loam soil was the best adapted for the growing of alfalfa, and that it would not thrive very well if there was any acid in the soil. So we set to work to see if the farms around our school could grow alfalfa to advantage. We used litmus paper in our experiment to detect acidity and found that nearly all the soil contained acid. As soon as we discovered these conditions we corrected or neutralized samples of this soil with air slacked lime or lime stone. Two or three tons of air-slacked lime per acre is a fair application. All of the pupils took litmus paper home with them and tested the soil on their fathers' farms. They corrected many samples of this soil.

Sometimes in addition to the neutralization it is necessary to inoculate the soil, and when this is done we turn our attention to the seed. Of course we always want the best seed. Some one was kind enough to inform us that any farmer could secure the best if he belonged to the "Wisconsin Alfalfa Order." By belonging to this order he could send to the College of Agriculture and be certain of getting pure seed. I have been told by my pupils that their fathers are going to try a field of alfalfa next spring, and the boys with their fathers are going to follow directions as they learned them at school. This indicates that the boy's interests are with the farm.

Perhaps in the study of corn and alfalfa my students evinced greater enthusiasm and a more animated spirit than in any other study. They always show a kindred feeling towards everything in nature and especially towards the things in their own community. Moreover they are not exceptional children in any way. They are just a good type of country boys and gilrs. Why, just a few weeks ago Superintendent Davies of Sauk county invited my seventh Grade class of boys to give an *exercise* in Agriculture before an institute assembly at Baraboo. Mr. Davies had scarcely closed the door when

one little fellow all excited asked, "Teacher, where will we get our dinner?"

Besides enjoying the study of crops, these country boys and girls love to test milk with the Babcock Milk Tester. Each pupil brings samples of milk from some particular cow and we test the milk at school. This work shows the pupils which cow on their farm is a boarder and which one is really bringing money into their pockets. Several "boarder" cows have already been sold on account of insufficient fat in their milk.

In a very inefficient way I have told you about a few things that are being done in our country schools to-day in Agriculture; and I firmly believe that the same things can be done in Horticulture. In fact I know they can be done. I am a strong advocate of teaching Horticulture in those communities in Wisconsin that are adapted for the growing of apples, fruits, or garden products.

The coming generation ought to be taught that there should be a farm orchard consisting of home fruit and fruit for the market; then, too, they ought to know how to take care of that orchard. Although we have not made any special attempts to study Horticulture in my school, my pupils readily appreciate the fact that the codling moth and the apple curculio injure or destroy three fourths or $250,000 worth of the apple crop in Wisconsin each year. This subject can be made as interesting and vital as any subject in Agriculture. For instance, one day in class, while we were studying the different varieties of apples that are adapted to our portion of Wisconsin, namely—the Duchess, Astrachan, Golden Russet, North Western Greening, Talman Sweet, Fameuse,—we cut into halves an apple of the Fameuse variety and found an apple worm, the codling moth, comfortably lodged within the core. Then the history of the codling moth was traced in a simple way like this: The adult moth usually lays her eggs on the leaves, and when they hatch the young larva eats its way into the fruit. It feeds inside the apple until full grown when it emerges from the fruit, finds a sheltered place either on the tree or ground, spins a cocoon, and enters upon the inactive stage. It remains in this stage for about twenty days, when the adult moth appears and lays eggs for a second generation. It is the larva of the second generation which is so frequently found in apples during the winter months. The greater portion of the first brood enter the fruit through the calyx or flower end, while a much smaller proportion of the second finds its way into the apple at this point. This little story was even readily grasped by the fourth Graders as they watched Mr. Codling Moth crawl around on a sheet of white paper.

As the study of the eradication of weeds followed naturally the study of weeds, so did the remedies for the codling moth follow the study of the moth. This took us into something entirely new—spraying. I shall not tell in detail about our study of spraying except to emphasize the fact which was emphasized in our classroom, that a wise farmer sprays his orchard as soon as the larva is hatched and before it gets to the apple. One pound of Paris Green to 150 to 200 gallons of water is the proper proportion for the poison solution.

In rural schools where Horticulture ought to have as much attention as any other subject, and where Horticulture WILL have the utmost attention in five or ten years, much might be taught about the plum curculio which is a close rival to the codling moth in the extent of the damage it inflicts upon the fruit grower. Its depredations are not confined to the plum, but it destroys large numbers of apples and cherries as well. The curculio is a snout beetle and lays its eggs in the fruit just beneath the skin. If the egg hatches the young larva burrows into the fruit, eats out the inner portions and fills the interior with excrement. In case of plums a majority of the fruit falls from the tree prematurely. Cherries attacked by the curculio usually remain on the tree.

Much might also me said about the cherry maggott, currant lice and currant saw-fly, strawberry leaf roller and the strawberry root louse and many others not quite so common as those already mentioned.

When it comes to the elimination of these pests the birds should not be lost sight of. If our country boys and girls could only be made to realize that the protection of birds meant preservation of fruit, the Horticulturist's problem would soon be solved. The birds eat millions of insects every year and all farmers should regard them as their very best friends. Longfellow tells us a story in one of his poems of how the Town Council in a New England town decided to kill the birds. He describes the place after the birds were gone:

"The summer came and all the birds were dead;
The days were like hot coals; the very ground was burned to ashes;
in the orchards fed
Myriads of caterpillars, and around
The cultivated fields and garden beds
Hosts of devouring insects crawled and found
No foe to check their march, till they had made
The land a desert without leaf or shade."

But then he tells us that the birds were brought again from the country round and he says,

"Think every morning when the sun peeps through
The dim, leaf-latticed windows of the grove
How jubilant the happy birds renew
Their old melodious madrigals of love!
And when you think of this remember too
'Tis always morning somewhere, and above
The awakening continents from shore to shore
Somewhere the birds are singing ever more."

And so way down the ages we find poets singing their praises to the birds, orchards, the gardens, and the flowers. Even Thoreau, who was one of the three great Transcendentalists, had time to turn aside from his high thinking and plain living and write an essay on "Wild Apples". Nor can we forget John Burroughs, whose name will stand out in the annals of history as being the greatest naturalist of his time. He enjoys writing us in his thatched cabin at Sunnyside, New

The 1913 prize winners, Madison city gardens.

Exhibits of flowers and vegetables from Madison city gardens, Labor Day 1913.

York, how they used to store for the winter bushels of apples in the ground, where the apples received a flavor which could not be secured in any other way.

Many a lesson in Horticulture might be taught from classical literature, natural history, geography, and arithmetic even; and when there's a language lesson to be written it would be advantageous and profitable to have it written on some garden plant, fruit or flower.

When *this* new subject finds its way into the curriculum of the country school of Wisconsin, I can see a future for Horticulture with gardens filled with verdant plants, the orchard trees loaded with delicious fruit, the vineyards filled with clusters of purple grapes, singing birds in the air, and a Horticultural Society second to none in the United States.

HOME AND SCHOOL GARDENS OF EAU CLAIRE.

MRS. A. H. SHOEMAKER.

I have been asked to tell the story of the Eau Claire Home and School Gardens, and it is a pleasure to do so. It is a simple story, yet to those of us who have watched the plan develop, it is a most interesting one.

Six years ago the Home and School Gardens were started in Eau Claire, under the direction of the superintendent of schools and the teachers. At that time there were just a few small gardens; but the interest has widened, and distributed itself very equally over the ten wards of the city, and last summer there was a record kept of 976 gardens. The garden may be only a tiny bit of land, a bed of flowers or vegetables; but the child takes it for his own, to cultivate, to plant and to harvest. The teacher keeps a record of it; of its exact dimensions, its location, and the things that are to be raised in it.

A small daughter in my family has given me a near view of some of these gardens, and the interest shown by many of the children is remarkable. It is something that appeals to most of them; they love to see things grow,—and who does not—they love the feeling of absolute ownership, of possession. One of the great questions of the early spring in our family is just where the school garden is to be; how many feet and inches it is to be made, and just what crop is to be raised in it. Until those things are settled, spring house cleaning and spring sewing must remain in the background; and we are further warned, that when the things begin to grow, we must not water it or help pull the weeds, for in that case, it would not be all hers.

Early in February of each year, it is the plan of Mr. W. H. Shultz our superintendent of schools, to send out to teachers and pupils, circulars relating to the gardens which help to arouse interest and enthusiasm for the approaching garden season. This circular contains

information on matters of soil, the best and easiest crops to be grown in the locality, and suggestions in matters of simple horticulture.

As a rule, the pupils furnish the seeds for their own gardens. If they have more than they need, they take them to their teachers, who pass them on to any who ask for them. Last year the Woman's Club made an appropriation to purchase seeds or young plants for the gardens. The School Garden Association of Boston furnished us with penny packages of seeds which were used with good results.

As far as possible, the children have their gardens at home; but when there is no suitable space at home, they are given some vacant lot as near by as possible. Sometimes a vacant lot is divided among several children, who cultivate it side by side, and carry on their work without any particular difficulty or disorder. In this practical way they learn to respect each other's rights, and only a few cases of trespass have occurred.

What an improvement it would be, if all the unsightly vacant lots in your town and mine, could be cleaned up and made to blossom with cucumber and tomato vines and beds of some of the old-fashioned flowers which are so easy to cultivate; and there are children enough too in every town who would gladly do it—they are only waiting for some one to organize and direct the work.

A prominent feature of the garden work in Eau Claire is the exhibit which is held in each school building in the early fall, and at which the finest products from the gardens are displayed to the public. Exhibit Day is a great day with the children. The school becomes a little county fair. The biggest pumpkins and squashes, the finest tomatoes, the choicest flowers are all there and to each exhibit is attached the name of the proud producer. It is a happy time and the only aristocrat that day is the one who owns the finest exhibit, all grown by the sweat of his brow, and the work of his hands. It is a wholesome lesson in democracy and a live "Back to the Soil" movement.

The ladies of the First Presbyterian Church at Eau Claire are pushing along the garden idea by giving seeds to the children of the Sunday School who wish for them, and an annual flower show is held in the church in September at which the flowers thus grown are shown to the public. Blue and white ribbon premiums are placed upon the best exhibits by competent judges.

Another work worthy of mention is that done by one of our ward schools upon a certain portion of our river bank. It was a most unsightly place when the children began work upon it; having been used as a dumping ground for refuse of various kinds.

This school under the direction of the same teacher has taken care of it for the last seven years, planting elms, willows, evergreens, vines and flowers. It is now a beauty spot, and dear to the heart of every child who helped to make it so.

There is a financial side to this matter which has not yet been emphasized in our town. What is the money value of these 976 gardens? As yet no complete record has been kept. The products have been used largely to supply the home table, and only the surplus has been sold. But even this has been considerable and quite an

amount. The earliest and finest home grown radishes that came to our table last summer, were brought to our door by a little ten year old boy, who proudly told me that he raised them all himself in his school garden, but that he let his mother help tie the bunches. Later tender young onions and delicious peas came to us from the same little garden.

It has been suggested that the coming summer, report blanks be distributed among the young gardeners, and a financial report asked for, which would approximate the commercial value of our gardens.

However, there is one garden of which I may speak with a personal knowledge, as it was situated in our ward. It occupied two good sized vacant lots, and was cultivated by two high school boys, who shared equally in both work and profit. It was planted to corn, cucumbers and tomatoes, but corn was the principal crop raised. They harvested their corn crop, delivered it to the canning factory, keeping a record of every transaction. At the end of the season they had almost one hundred dollars to divide between them.

It has been said that "it is a great thing to make two blades of grass grow where only one grew before". What then shall be said of the boys and girls who take a vacant city lot, and make corn and cucumbers grow where only weeds and tin cans grew before?

SHEBOYGAN CHILDREN'S GARDENS.

MARIE C. KOHLER, Sheboygan.

Sheboygan was asked to send a delegate to the Horticultural Convention at Madison, and Mr. Palmer, of the Longfellow School, was ready to report on Children's Gardens when, on the very day of his departure, a telegram was received from the secretary saying, "We want a woman, not a man." Having been a judge in the Children's Garden contest last summer, this honor was delegated to me, and I gladly accepted.

Mr. Palmer, Principal of the Longfellow School, and forerunner of the garden movement in Sheboygan, in the spring of 1909, planned a garden contest to be held the following fall. Through the courtesy of Mr. Matthewson, our florist, seeds were furnished the children of the school at a penny a package. A choice of four varieties was given:—Nasturtiums, Asters, Verbenas, and Ten Weeks Stock. About 350 pupils took from 1 to 5 packages each. The gardens were made at their own homes, and the third Friday after the opening of school in the fall, a flower show was held in the school, at which time all pupils who had raised flowers competed. The various rooms were also decorated, and prizes awarded to the 1st, 2nd, and 3rd best appearing rooms.

The prizes this year were donated by the business firms of the city and consisted of many toys and articles of use ranging from a top to a $10.00 bank account.

During the day devóted to the show each desk had its bouquet of flowers; this created an interest among the pupils not eligible to the prizes, and, at the same time, added to the attractiveness of the exhibit.

A special invitation was sent to parents to visit the school on the day of the flower show, which had the advantage of bringing the parents and teachers together early in the school year. So successful was the show that two have since been held with some changes, the boys have raised and exhibited vegetables instead of flowers, and honors have been substituted for prizes. In each of the contests 50 per cent of the pupils enrolled in the school have taken part. It has been a stimulus to nature work, has brought parent and teacher together and the school and community have been bettered by the effort. The grounds of Mr. Palmer's school, the Longfellow school, by an artistic arrangement of trees, flowers and shrubs, has been made one of the most attractive in the city.

Early in the spring of 1913 a plan, wider in scope and intending to embrace the entire city, was proposed by the Advisory Committee of the Associated Charities.

A meeting of the members of the Advisory Board, and representatives of the Mothers' Clubs and Parents-Teachers' Associations, was held, and the following rules which were to govern the contest drawn up:

CHILDREN'S
GARDEN COMPETITION
OF SHEBOYGAN
Directed by
THE ASSOCIATED CHARITIES.

RULES.

1. Any boy or girl under the age of 15 years may enter this competition. Registration must be made in person at the office of the Associated Charities, 721 Ontario Avenue.

2. Each competitor will be placed upon his or her honor as to the assistance given during the season.

3. Ground space to be 100 square feet, arranged to best suit the yard or garden. (Paths between seed beds not to be counted).

4. Competitors are to select either a vegetable, or a flower garden. The flowers may be in two or more beds to suit the yard.

5. Vegetable garden to consist of Beets, Carrots, Winter Onions, Irish Potatoes, and Popcorn. Flower garden to consist of Zinnias, Nasturtiums, Stocks, Asters, and Marigolds. Seeds will be furnished at time of registration. (No other seeds to be used).

6. Monthly prizes, to be announced later, will be given during the months of June, July and August. These prizes will be awarded by judges appointed by the Associated Charities, the following points to be considered:

a Age of competitor, and previous knowledge of gardening.
b Physical condition, and other employment.
c Grade of garden soil, location in yard for sunshine and water supply.
d Care of surrounding ground.
e State of garden at time of inspection.

7. Final prizes given for best exhibit of both vegetables and flowers in September are as follows:

Vegetable garden, 1st, $5.00; 2nd, $3.00; 3rd, $2.00; 4th, $1.00; 5th, $1.00.
Flower garden, 1st, $5.00; 2nd, $3.00; 3rd, $2.00; 4th, $1.00; 5th, $1.00.

If there is not the required ground space in the home yard, other ground available may be used.

The surrounding space should have attention. Unsightly places may be covered with vines such as morning glories, wild cucumbers, hops, gourds, squash, or pumpkins. Giant sunflowers and the castor bean will be excellent for screening old buildings, etc.

The rules were printed on sheets of blue paper, and distributed to the children in the city schools, to take home. At the same time all were asked to fill out the following registration blanks:

Kind. Registration Blank. Date.
Name .....
Address .....
School .....
Age .....
Knowledge of gardening.....
Location of garden .....
Use of city water .....
Help given .....

Only 165 competed, and these were in the outlying districts. The first inspection of the gardens took place the latter part of June and early in July. Prizes consisted of 3 pictures, and a table book-rack donated by local merchants.

With the first inspection gardens not planted according to instructions and those badly neglected were thrown out of the list. The children did not know when the judges would appear, and the frequent rains which had served to keep their gardens well watered had also caused much damage.

Two little boys looking for all the world like Brigg's cartoon in the Chicago Tribune of—"When a Feller Needs a Friend," gazed ruefully at a hillside, and remarked: "Our flowers all swum away on us."

While a little Holland girl in whose garden weeds and flowers struggled for supremacy, informed us that she didn't know the difference between American flowers and weeds. One of the judges, the rector of the Episcopal Church, who has a quaint English garden,

and a genuine love for flowers and children, got down on his knees and showed her the difference, by weeding the entire garden.

Some gardens were beautifully free from weeds and as regularly planted as though a tape measure had been used in laying them out. Two little maids who were away fishing when the judges arrived had gardens as wonderfully alike as two peas. Some of the children were handicapped in that they carried papers, worked in stores or in the pea factory. All this was made note of in the inspection. Most of the parents were much interested in their children's efforts and were eager to answer questions. One mother slipped her arm through mine, and invited me into the gooseberry patch, assuring me that, "Willy done it all alone, only his pa helped him."

Quite pathetic was the attempt of a little Polish girl with an unpronounceable name, to have a garden. In an ugly plot of ground overlooking the railroad tracks, she had planted her garden and over it had suspended on 4 sticks a bit of rag carpet to protect her flowers from the rays of the sun. Amid the most sordid surroundings she struggled towards something better and higher.

As 80 gardens were thrown out after the first inspection, only 85 competed in the next contest which was held the beginning of August. Prizes were donated by the merchants.

The very late spring prevented a third inspection and the contest closed with an exhibit of the flowers and vegetables raised by those children of the 85 keeping up their gardens throughout the season.

Through the kindness of the H. C. Prang Co. the exhibit was held on the second floor of the New Store Building, September 19th. There was a very hard wind and rain storm early in the morning, which prevented the children from getting down, and the entries of flowers were but 16, and many of these spoiled by the hard rain. 30 children brought in vegetables.

I struggled over in the afternoon in a driving rain to look at the exhibit. There were some very artistic bouquets; others were stiff pyramidal affairs like the ones we presented to our grandmothers on their birthdays. The vegetables clean, large and sound could have competed with any shown at our county fairs.

One little maid had made a case, had lined it with wallpaper like the top of an old-fashioned trunk, and each compartment contained a different vegetable. $22.00 was awarded in cash prizes, the money having been given by the Societies of the Advisory Committee of the Associated Charities, and the Mother's Clubs of the schools.

In making their decisions, the judges considered the age of the child, the condition of the garden during the summer when the inspections were made, the interest the child took, the probability of aid given, and the exhibit itself. The vegetables exhibited were given by the children to the Home for the Friendless.

A plan was suggested to have a city market twice a week, near the center of the city, under supervision of a committee, where the children could bring their fruits and vegetables and sell them, but it was not considered feasible last summer and it is quite too early

in the year to say what will be done this summer. However, we are hoping for such.

Prof. Charles Zueblin, of Boston, who lectured here on the Twentieth Century City has gotten the business men interested, and with them, the Mother's Clubs and all the school children enlisted in our cause, what cannot we expect?

Trying as it was to be whirled about to 29 gardens in one afternoon, and to be seeing gardens all night, yet I consider my two afternoons spent in inspecting gardens among the most enjoyable days of last summer. And when one despairs of the present day child, whose sole diversion seems to be the moving-picture show, one ought to ask to be permitted to serve on a children's garden committee, and his faith will be restored.

FACTS AND FANCIES ABOUT GARDENS.

ANNA A. IHRIG, Oshkosh.

Have you a garden? Many of you I know are market gardeners. Most of you have gardens that supply your home with vegetables, fruit and flowers. But the garden I wish to talk about is different. We will call it the garden wonderful. It must possess the element of wonder. Our market and home gardens in which we grow the same things year after year lose some of their first wonderfulness and become quite prosaic. But there is yet a corner where the wonders grow. We hear the vegetable gardeners say "I wonder" and straightway he goes and plants a few billion dollar potatoes or Buckstaff tomatoes in his wonder garden. The small fruit grower's wonder garden contains superb ever-bearing strawberries and wonder berries. The orchardist has a choice site where he plants piece roots and whole roots and own roots and crab roots and tries out the improved methods of spraying and pruning. The housewife plants a packet of chard or salsify or some vegetable new to her and the flower lover is always seeking new wonders. Thus we see that all gardens have their wonder side, but the garden wonderful belongs to the children.

Garden making appeals to all normal children. They like to play in the dirt, and they like the element of wonder and uncertainty. If you add to this the joy of possession, few children but will meet you half way. The joy of possession, is responsible for the added dignity and wisdom that we preceive in our minister and our doctor. Our dog, our breed of cattle or fowls are superior to others, because of this joy of possession. Our society, our locality, our Wisconsin are all dependent on the joy of possession for much of their interest. So with the child, the joy of possession and the appeal of the wonderful, attract him immediately, and as his in-

terest in gardening grows he grows with it physically, mentally, and morally stronger. The children's garden movement is surely worthy of our support. I am glad that gardens have been my life long associates. In memory, I stand, a little child in my Grandmother's garden and hear her say as she culls a bouquet for me, "Tell your mother the red rose is from the bush that "Mrs." Cowling gave me."

Again, as a young girl I gather the white lilacs and snowballs in the home garden, and later transplanted to my very own garden the old and the new favorites. There my sons and my daughters have gathered the rosies and posies, for themselves and their friends, and now a little golden haired girlie of two summers helps Grandma pick the pansies. The garden is an infinite resource to us all. It responds to our mood, comforts us in sorrow, assuages our grief, relieves our distresses, and drives away the blues. It rejoices in our joy, upholds our ambitions, and is always ready with a sympathetic understanding of our needs. It stands next to the weather as a safe and sane topic of conversation whether you are conversing with a gossipy neighbor or the stranger within your gates. And not only is the garden a safe subject for conversation, but it will also speak for itself and its presiding genius. At Oshkosh we utilize this fact and during the summer months let the gardens talk.

Liberty H. Bailey has said that to know a flower well, and to grow it well, is more than botany. We say: to know a gardener well is more than horticulture, and we strive to know not only our gardens but each other. We visit our members and let their gardens talk to us.

Our meetings are held the first Tuesday in each month. In winter at the chamber of commerce rooms in the city of Oshkosh. These are just ordinary round table affairs where questions are asked and answered and some one reads a page or two culled from his experience. In addition to this regular programme in Jan. we elect officers. In February we hear and discuss reports from the state meeting. In March we partake of our annual oyster dinner, this at the home of some member. Our last March meeting was with Mr. and Mrs. Ward B. Davis. This charming young couple took pleasure in showing us the many conveniences of their new home, pointing out where they would improve if building again although they had lived but three months in their new home.

May found us scattered over the hot-bed yards of Christensen and Davis. Frame after frame of plants in all stages of development from seedlings just breaking the soil to the finished plant ready for market on the morrow. The men are standing in groups and you hear such words as "water-system," "hot-bed soil," "straw-mats," etc. The ladies are divided some viewing the tulip beds and pansy frames, some clustered about a fine specimen of Forsythia in full bloom, and still another bunch striving to see who can name correctly the most varieties in a frame of seedling annuals just show-

ing their first leaves. At six o'clock we adjourn to the lawn where a picnic supper is served, this followed by music or other entertaining features.

June meeting at N. A. Rasmussen's Fruit Farm. Here were all the small fruits, gooseberries, currants, raspberries, as well as plums, cherries, and apples all covered with half grown fruit and Bordeaux mixture. A fine field of alfalfa, orderly vegetable gardens, sanitary cow and poultry houses filled with blooded stock. The auto truck loaded for the morning trip to market, a new setting of ornamental shrubbery, the well shaded lawn and the handsome specimen of Dutchmans pipe shading the east porch, all spoke eloquently. The children showed me their pansy bed and explained their method which I will give you by slightly changing the nursery rhyme.

There was a young girl named Amanda
Who said When my Papa grows pansies
We pick out the best and then sell the rest
It is much the best way said Amanda.

July finds us at Lake Rest Fruit Farm. Here as usual the men follow the lead of the proprietor J. W. Roe, to the plum and apple orchards, while the ladies are at once attracted by the profusion and variety of bedding plants adjoining the lawn. After these were admired and with the assistance of Mr. Roe's mother classified, they all stroll down the shady lane lined by old apple trees through the vegetable gardens to Lake Rest and along the shore around the point past the harbor and bathing beach, back to the house for the picnic supper.

August a trip by launch up the Fox and Wolf rivers to inspect the garden of the Winnebago County Agricultural School in charge of a young gardener belonging to our society. Here the men discovered, and demonstrated the beginning and the end of the new melon disease; also an onion pest, and a sweet potato patch needing treatment which it immediately received. While the ladies inspected the fine smooth tomatoes which were unusually early and the flowers and ornamental shrubs. Dinner was served in the dining room of the school and the return trip began at sunset.

September at Wm. Nelsons, here the attractions were another new and model farm house which replaced the one destroyed by fire. A promising young commercial orchard, the raspberry plantations, a poultry yard well filled with chickens and geese and last but not least the melon patch. We all gathered on the spacious lawn and sampled the melons then followed the usual supper, music and entertainment.

October at our secretary's Mr. P. Fishers. This meeting I missed but R. J. Coe was present and seemed to be the center of attraction.

November at W. A. Lovells. It was rather late in the season for gardens to talk but the heavy canes of a field of raspberries excited

comment. Some of the ladies visited the country cemetery across the road which furnished a theme for a talk on cemetery planting. The after supper programme was unusually brilliant, consisting of songs by the host, Mr. Lovell and volunteer stunts by all from the gray-haired M. V. Sperbeck down to the children of tender years.

Dear Friends; let us endeavor to induce more people to plant more gardens and if an ill-wind comes our way remember.

"Which ever way the wind doth blow, some heart is glad to have it so, then blow it east, or blow it west, that wind that blows, that wind is best. My little bark sails not alone, a thousand fleets from every zone are out upon a thousand seas, and what to me were favoring breeze, might dash another with the shock of doom, upon some hidden rock; and so, I do not dare to pray for winds to waft me on my way, but leave it to a higher will to stay or speed me, trusting still that he who launched by bark will sail with me and will not fail whatever breezes may prevail to land me every peril past within the sheltering haven at last."

QUALITY FIRST.

MRS. H. H. MORGAN, Madison.

More than a century ago, the Common Law of England recognized the right of the manufacturer to be protected in the use of his name or other appropriate mark or brand in offering his wares to the consumer. This is now known as the Trade Mark.

Every civilized nation now has strict laws securing the manufacturer or producer against unfair competition in the enjoyment of a trade established through the special merit of the particular article offered for sale by him.

No argument need be presented to show the wisdom of thus rewarding the manufacturer or producer for supplying an honest, high-grade product, and at the same time the consumer may know that he is purchasing exactly what he desires.

At the last annual session of our State Horticultural Society steps were taken looking to the adoption of a brand to be affixed to all horticultural products of the state, provided only that the growers using the same keep their fruits or berries up to a given standard. It is hoped that this plan may be carried out as a state-wide policy, however, this is all the more reason why each grower ought first to establish an individual reputation for the quality of his output.

Let him adopt and use a name or brand. The public will soon recognize that A's apples and B's berries are always the choicest. The careless orchard-man, who neglects to care for and develop his trees and who packs without sorting, need not be feared in competition. The berry-raiser who has poor vines, poor berries and whose boxes are scantily filled, will soon find the market closed to him.

The highest business ambition of the horticulturist should be, and eventually will be, to have his name or his brand or trade mark a synonym for sound fruit, carefully packed and of honest measure.

There is no money in flooding the market with imperfect fruit or berries. The cost of producing the highest grade article is but a trifle greater than that of putting out a poor grade. It costs as much to pick a barrel of poor apples as it does to pick a barrel of those that are perfect. The same labor is necessary to haul them; the same transportation rates apply to all grades, but how different is the price received!

As scientific methods ought to be employed by the horticulturist as by the manufacturer. The size of a crop does not measure the profit to the grower. The elements of labor, cost of barrels, boxes, crates, hauling and freight are of vital importance. These charges on one thousand crates of berries are double those on five hundred, and the producer of the thousand may not in fact make a net profit as large as he who sells the five hundred.

The berry grower should govern his fruit acreage in accordance with his ability to promptly pick, crate, haul and market. Thus the best grades of vines and bushes only should be planted and in such manner and numbers that each may receive proper attention.

A heavy crop on a small acreage will be far more profitable than the same number of berries scattered through longer and half cared for rows. The small fruit vine or bush responds remarkably to cultivation and care. Reduce the acreage to be cultivated, pruned and sprayed to the smallest limit possible. A picker in a day can gather fifty per cent more from a few vines loaded with large and firm berries than he can from many bearing sparsely. The labor required in the care of the vines and the picking of the berries is a much larger item than is commonly appreciated. Reduce this to a minimum by concentrating on a limited area and it will soon be discovered that the quality of the crop will improve materially.

Insist that the stock you buy is healthy and vigorous. A diseased strawberry vine or berry bush is not only a poor producer but is also a constant menace to the adjoining plants. I think it takes a woman to be really firm about this. Men are inclined to plant whatever comes, but do not allow it.

Raise only fruit or berries of the highest quality. If you sell direct to the consumer, she will not begrudge paying you a top price. She knows that she is not running the risk of waste and that sound fruit goes much further than poor. If your products are handled by a commission man, he will soon recognize the reliability of your brand and surprise you by paying prices that are fair. The bargain hunter has long since learned that she is merely cheating herself when she carries home second grade fruit or berries for the table, and it has been amply proven that there will always be a demand for the best and that those who want the best are willing to pay for it.

TRANSACTIONS

OF THE

Wisconsin State Horticultural Society

SUMMER MEETING, Sturgeon Bay, August 20–21, 1913

MARKETING FRUITS.

F. KERN, Bayfield.

It is absolutely necessary, in order to market a fruit crop successfully to have growers producing that crop, organized. Why? It's the first step in marketing to-day; fruit cannot be handled without organizing.

Before you can sell a crop you must have the assurance that you are going to have the crop to sell and with one hundred unorganized growers to deal with and for, you are not sure of anything, where if they are properly organized and you can depend on fifty acres or one hundred and fifty acres of fruit you have something to offer that will attract buyers and without buyers you have no market. In one of the largest Coast Associations the growers all signed a written contract to deliver all their fruit to the Association for five years. The manager of that Association was able to estimate in advance, the amount of each kind of fruit he would have to offer each year for five years. The fact that they had contracted the entire output to the association for five years was in itself a great selling feature. First it insured quality and quantity. It attracted the markets of the world. They were able to establish selling agencies in all the principal markets at a selling cost of 10 cents per box, where the lowest rate of commission any of the commission houses charge is 10 per cent. Ten cents compared with 10 per cent on western box apples even at a dollar and fifty cents is a saving of fifty per cent of the ordinary selling cost. Wholesale

fruit houses I think much prefer to deal with an organization rather than a hundred individuals.

There are perhaps as many different views on this subject and as many different methods of marketing a crop as there are men in the business. Some Associations believe in consigning everything. I don't. I believe in selling every dollar's worth you can sell and I try to sell our crop and do sell the bulk of it to wholesale fruit dealers. We sell all we can to the retail dealers direct and have gained a very satisfactory trade of this kind.

The first step in marketing after organizing, is knowing what you have to sell. You know then that you will have a good grade and one that is not so good. The next step is to find and interest the buyer. Sell all you can of the best grade and if you are obliged to consign any, consign the B grade. Have territory enough interested in your crop so that you will not have to dump it all in one or two markets and in that way keep your market healthy. The wholesale houses appreciate this. If we put four cars into Minneapolis in a day when the market really only ought to have two the fruit houses are bound to dispose of it and as a natural consequence the price is cut to move the fruit, where if I consign one car each to four different markets they all have a demand for all the fruit they have and are able to get good prices and we as well as the wholesale dealer, profit.

We sell a great deal of fruit direct to the retail trade. The wholesale market establishes the market price. We can at least get as much from the retail dealer, as he would have to pay the wholesale dealer for it, and if we glut the large markets, by dumping too much in a place in one day, the market breaks and the wholesaler shoves out every case he can to the retail dealers throughout the country, and cuts the price to them, and they in turn come back at us with the alarming statement; that they can buy our berries in Minneapolis for less money than we are charging. We have established this cut ourselves through overstocking some one market. The firmer you can keep the large markets, the better prices you can get from the retailer and the more money we will all make. I do not believe that the retail dealer ever makes any money handling berries, but he is expected to have everything in season, and he handles it more for accommodation than for the profit for he is bound to have losses that will offset his profits, and to protect himself from loss he is obliged to sell at a good margin.

In 1911 we had a very remarkable trade with the retail dealers which we worked solely through correspondence, using an attractive strawberry letter head. In 1912 we were obliged to forfeit most of this trade in order to prove to the express company that our business was worth looking after, and this season after being appointed express agent myself, we again started at work to build up an order trade and have succeeded very well by employing a salesman to cover a territory that requires two weeks and we have covered this

territory three times during the entire season and we find it has proven the best selling system we have ever adopted. While it costs some more than circular letters, it is a great satisfaction to know conditions in what we term our territory, and it assists wonderfully in collecting accounts. Through our salesman, we adjusted and settled every complaint on shipments made this season for less than $10.00, and the cuts and refunds asked from an order trade are by no means a small item.

If we could organize all the fruit growing districts into local associations, and then organize a central association where each local association would contribute its part toward the selling of the crop, we could afford to have the very best salesman on the road to sell our fruit direct to the retail trade and the burden would be borne equally, but under the present marketing system in this state there is very little coöperation if any. Every locality works to sell the crop they are interested in, and if by chance they get into the other fellows territory and find lower prices the remedy seems to be to meet the prices and possibly cut them a little. There certainly is a field for an improved marketing system in this state and in my paper I have aimed to start a discussion.

In my opinion, the first step is ORGANIZATION, the second, quality, and then with proper inspection and an honest pack I believe the question of marketing will be partially solved.

Being on a committee on a State Marketing Association I have given some time and thought to the subject. This question presents itself: How can we organize a state Association to control the distribution of a crop, not for the purpose of getting better prices but for the purpose of better distribution which ultimately means better prices, without being accused of violating that law so commonly referred to as the Anti-Trust Law? That this question can and will be solved, there is no question. In Winnipeg, I witnessed last week a selling system in use by a commission house there that appeared to me to dissolve the anti-trust bugbear. This firm is strictly a commission house that does not buy from any one. Simply handle consignments, and their method appealed to me and I think could be used by any central marketing association. Simply a fruit auction. Not such as the Pool commission houses patronize. No.

This firm holds their own fruit auction, right in their own building, and every buyer who is in the market for a dollars worth or a carload, is on hand at 9 a. m. to bid on his requirements. They handle everything you want to consign, in the fruit and vegetable line and do an immense business and they have for competitors the Nash Houses, perhaps the strongest and best organized chain of commission houses in the northwest, but they are able to handle all that comes. They either unload a car in the house or place a sample of a carload on the floor, from all the cars ready to unload, and a buyer bids on so many crates or boxes or bushels and the

highest bidder of course buys that portion of the car or line. They continue on this car or line until it is all sold or until the trade has been supplied, and take the next car and hold this sale for a limited time and every buyer buys his supply for the day and the sale is closed. They haul away what they have purchased and pay the cash for it and they buy the bad with the good just as it runs. If they buy after the sale closes the seller sets the price.

The manager told me that the buyers had never yet tried to organize to keep the price down, that they seemed to like the plan and preferred buying at auction, where they could see before the sale started just what they were to buy, consider the quality and decide on what they could afford to pay.

I cannot take up any more time explaining this system but it occurred to me that it could be applied to a central selling association, where we could all consign what the Central association could handle, and they could divert and distribute the surplus and in this way the buying public would have an even chance to buy and there could be no discrimination. If one Association could market all the products of all our associations, we certainly would have more equal distribution and that alone regulates the price.

For instance, if Sparta is shipping strawberries to Minneapolis, St. Paul, Duluth, Fargo and Grand Forks at the same time we are shipping from Bayfield, (this seldom happens,) we do not know just where to place a car to advantage, and we consign it to Duluth and we call up the following afternoon to know how it is selling and the house we consigned to tells us the market is bad, that there is a car in there from Sparta, one from Alma Center, one from Sturgeon Bay, and that prices are demoralized. Who is at fault? Every mother's son of us. We should be better organized and know what each district is doing and help to better marketing conditions, instead of going blindly independent and not only hurting our own market but hurting the market for everyone of the shipping districts that are on the market at the same season of the year.

OUR HY-BRED RELATIONS.

W. J. MOYLE, Union Grove.

In the horticultural world at the present time, nothing is occupying the attention of the people more than the results that are produced by hybridizing of fruits and flowers. The hand of man has brought forth many wonderful and marvelous results. Luther Burbank has kept the horticultural press guessing for years as to what next would be produced but much to our regret most of all his productions, originating in a climate much milder than ours, have proved disappointing, when grown on Wisconsin soil. Several years ago, while employed at the Wisconsin experiment station, the writer's attention was constantly drawn towards the fact that we must grow varieties adapted to our conditions.

We had a quantity of Sand cherries fruiting at the Station at that time, Prof. Goff and myself often discussed the possibilities of improving this hardy little cherry. With this thought in mind the writer undertook a series of experiments in budding on this stock other varieties of stone fruits, such as Japanese, tame and native plums, cherries both sweet and sour. Our object at that time was to get stock that would dwarf the tree and thus produce early fruiting. The results of this experiment were most gratifying, as we found that buds took readily to the Sand cherry stock; our anticipations were high of the possibilities presented. At this juncture our connections were severed with the Station forces and the matter was dropped as far as the writer was concerned for the more pressing bread and butter problems of life.

It seems, however, there were other experimenters in the field, who began to realize the possibilities of the Sand cherry as a hardy Mother plant, on which some valuable hybridizing might be done. Notable among these was Prof. Hansen of South Dakota.

When the Compass Cherry, a cross between the Sand cherry and the Native Plum, came into existence at Springfield, Minnesota, everybody laughed and the nurseryman who had the gall to sell it was classed as a charlatan. When the people that planted them, (the final judges), reported, everybody sat up and took notice. It was absolutely hardy and best of all, it began to bear at once and kept it up every year no matter where planted or how trying the conditions.

The Sand cherry blood in this cross, overcame the one great fault of our Native plum, i. e., its uncertainty to bear fruit.

The writer's attention was called to the value of Prof. Hansen's Hybrids by Harlow Rockhill, the ever bearing strawberry man of Conrad, Iowa. We bought the following varieties, Opata, Sansota, Sapa and Cheresota in the Spring of 1912. They all bore a good crop the present season.

The Opata, a cross between the Sand cherry and the Gold plum is a cling stone, green fleshed and greenish brown plum of good size and high quality, fine for eating out of the hand. Everybody should give it a welcome place in their back yard among the currants and gooseberries.

Sapa reminds me of an over grown ox-heart cherry and appeals to me very strongly as it opens the gateway to the production of a plum that will equal the best sweet cherries and thrive in our climate. Fruit good size, round, skin thin and dark flesh, very meaty, of fine quality inclined to acidity, stone parts freely from the flesh. For culinary purposes this plum is unexcelled. They ripened with us the first part of August and we had a difficult job to keep the birds from getting all of them, thus testifying to their value and merit.

Sansota and Cheresota, crosses between the Sand cherry and De Sota plum are ripening at this time; while not of as high quality as the former, they are valuable additions to our fruit list.

We predict that these hybrid Sand cherries and their progeny, will soon be found growing in every well kept farden. They will particularly appeal to the man with a city lot as they require little space and bear early and abundantly.

About 12 years ago, the writer was walking through the nursery grounds of F. K. Pheonix, Delavan, Wisconsin. The old gentleman had passed away a year or two before our visit. Our attention was called to hundreds of Seedling Rosa Rugosa roses that he had grown. Mr. Pheonix was a horticulturist of high order and was able to see visions and dream dreams of horticultural possibilities, far beyond the sight of ordinary man. The old gentleman was looking for a chance cross with some of our tender roses and by this means hoped to get a rose with the exquisite sweetness and beauty of a Mrs. John Laing, with a constitution and leaf like the Rosa Rugosa. Climatic conditions were against him and fate was very stingy in awarding him.

However, the French have taken up the matter and with their more salubrious climate and advanced knowledge are producing a wonderful race of these hybrid Rosa Rugosa roses.

The one great drawback so far in our estimation to these roses, is they all bloom in clusters, on short stems like the Rugosa with few exceptions. Conrad F. Meyer, a pink, and its sport Nova Zembla, a white, being the only exceptions. These two roses are beauties, hardy and vigorous.

Mrs. Geo. Bruant and Blanche de Coubert are both white semi-double, beautiful buds and absolutely hardy.

Agnes Emily Carmen grows and looks like a rugosa. Beautiful carmine-like color, semi-double and a very desirable rose.

Belle de Potevine another semi-double, blooms in clusters, sweet scented and of an old rose shade.

Roseraie de L. Hay a beautiful rose, great bloomer, flowers a purplish rose, sweet scented and semi-double. Will be planted extensively when better known.

Keep your eyes on the hybrid Rosa Rugosa Roses and try them all.

BETTER HOMES.

MRS. GEO. FRATT, Burlington.

The article in the June number of Wisconsin Horticulture entitled "No Gardens" and mentioning farms without gardens, filled me with compassion for people so unappreciative of their opportunities as to rob themselves of so much of the joy of living; and I long to beckon them out onto a vineclad porch overlooking a bed of bright flowers, and offer them fresh fruit from the berry patch, in an effort to inspire them with enthusiasm for that which is the best part of the home, its garden.

By garden I do not mean the vegetable patch only, but it includes also flowers and berries, and a shady place under a fruit tree. Necessarily in these days of scarcity of help, the care of the garden falls mostly to the lot of the woman of the family, and can and ought by her to be made a recreation from her labors indoors, and a source of pleasure and of health, for there is no better tonic than pure air, and no better way to keep vigorous than the exercise attending the care of a garden.

A friend of mine, a lady much older than myself, who has recently established a new home and an ideal garden in connection with it said to me, "People tell me they think I have enough to do in the house without working the garden, but I tell them the garden is my vacation, and if I did not do a little work in it every day I should not have the health and strength to do my work in the house." I wish I could persuade some who think they are not strong enough to work a garden of the truth of her words, I will give you my own experience in an endeavor to induce some indifferent ones to come out and work for health, pleasure and profit, and help solve that much mooted question of the day, the cost of living, by supplying the table with fresh vegetables and fruit.

When eight years ago we moved from our farm, with all that implies in the way of broad fields, and woods, and orchard and garden, into a new house, on a new lot in a new subdivision of the town, I was confronted with the problem of converting this bare place into something that would seem like real home.

I also felt the necessity of working with judgment, for there was work indoors that required strength, and I had none too much, but much may be accomplished by a few hours work every day, preferably in the morning, if the day is hot, before the sun is up; and any one who has not greeted the awakening day in the garden has missed much of the true joy of living.

Being accustomed to plenty of space and light, my first effort was to purchase the lot adjoining ours on the south, so as to guard against the intrusion of too near neighbors, then, of course I would

have a garden on it and some flowers. The investment was not great, and the value has more than trebled since.

We moved into the house in hot July and fully realized that the first essential was to procure shade. Trees grow but slowly, and though we brought some young elm trees from the farm and planted them that fall, a few years later when our street was graded it was cut down several feet, so that our trees had to be reset, putting them back a great deal, and so they have not afforded us much protection.

Not much could be done the remainder of the year except plan and prepare for spring. These plans included the planting of pear trees in the backyard, thus trying to combine fruit and shade, setting the Kiefer which grows rapidly and tall so as to shade the back porch.

Cherry trees which we brought from the farm also added, and planted on the south side. I planted seeds of Trumpet vine and Catalpa in boxes in the house during the winter, and when time came for setting them out had vines and trees ready, which grew very rapidly; this saved expenses, besides affording an interesting experiment.

I also threw the pits of peaches onto the vacant lot which had been plowed, and the next year some fine trees grew up from them which I with difficulty saved from the plow, the plowman contending that "them's no good; better plow them under and save bother," and was by others laughed at for my pains. However I rescued some, and to protect them planted currants and grapes in row with them and made the plowman plow around them. Then there came a severe winter and killed the trees before they were old enough to bear, so all the good I had of them was the shade they gave while alive. But I had others growing up and a few years later was rewarded by such an abundant crop of such luscious peaches, as to silence all critics, and have kept on growing peach trees ever since.

But I am hurrying ahead of time, for I wanted to tell you of my troubles; we generally like to do so.

The land here was infested with quack or couch grass. I had made the acquaintance of this grass on the farm, and realized the futility of planting anything permanent until it was exterminated. and that in order to do so I must get at the roots; such roots as I pulled out, a yard long, and thick like asparagus, gave proof of the fertility of the soil. This work required several years, for I wanted to raise vegetables and strawberries each year, while doing this, so took it piecemeal, clearing a patch of what I could in the spring, before planting, and again in the fall after vegetables were grown.

The front of the lot was to be devoted to lawn and flowers. My friends, knowing of my love for flowers offered me many, which I set where I could until I had the ground cleared of quack, so I had often to reset plants, and have not finished yet, for every year I see

something that can be changed to make the effect more pleasing, or am getting a few more plants, and keeping up a constant interest in them. My general plan is to have a row of shrubs at the side of the lot farthest from the house, and against this background plant perennials, trying to have something always in bloom, and as most perennials blossom in the spring, I am studying to get some that will bloom later, and am grateful for any suggestions along this line.

A row of tall Iris borders the path between the flowers and the vegetable garden, forming a background also for smaller plants and this bed is bordered by a dwarf phlox which is a mass of bloom very early in the season, and is a delight to the passers by.

Then the tulip bed occupies the space that is in full view of both house and street. This I cover for winter protection with the litter from the flower garden, allowing them to seed themselves, and, when the tulips have finished blooming the bed will be gay with self-sown poppies, candytuft, and later on with the later bloomers, the California Poppies and Cosmos blooming until frost.

A woman likes to make things pay, and not be told that she has no business capabilities, so, when I had some of the ground cleared of quack, I planted a good sized patch of raspberries, and by selling the surplus fruit, soon was reimbursed for all my outlays, and determined to have just one apple tree, thinking that the time to wait for apple trees to begin to bear seemed too long. I will say in this connection that my expenses were not great, for by beginning with a few plants (and these were given me by a neighbor from the prunings from his patch) one can soon increase the number by propagation.

Following hints given in Wisconsin Horticulture I bought a Wealthy Apple, and felt encouraged by its bearing a few years later, to add another, a Yellow Transparent.

Later on reading an offer of a collection of plum trees cheap I yielded to temptation and added those.

By this time I had so many trees and bushes planted that plowing was difficult, and the ground being cleared of Quack, concluded to plant more trees and stop plowing. So my garden grew from a vegetable garden into an orchard.

I planted more cherry trees, some dwarf pear, and one row of apple trees ranging from early to late, the money from the berries covering all expenses.

The apple trees I planted the regulation distance apart, but between two apple trees I planted some of my beloved peach trees, reasoning that they may bear and will die before the apple trees will require the space. I do not know whether this would be approved by Horticulturists, but I like to do a little experimenting on my own account in the home garden.

Failing to excite any enthusiasm in regard to the work of the garden among the members of my family, but finding that they

appreciate the results, I will give you a list of the good things in succession that we have had from my fruit garden this year, though the season has been unfavorable, and the harvest has not made good the promise of the early spring, my first garden being now about 16 years old.

First rhubarb, strawberries following, then raspberries, black and red. Currants, red and white, cherries, gooseberries, apples, plums, 2 kinds, pears, 2 kinds, peaches, 3 kinds, some grapes, melons and tomatoes, besides the vegetables, with a goodly supply of jelly, spiced and canned fruit for winter, and money enough to buy more plants or trees if I find anything more that I want, which I most likely shall before spring. Then we must not forget the gain in health, and the pleasure of it all, nor the pleasure given to others with the flowers which were sent to many a sick chamber, and supplied the decoration on many occasions. But the picking of berries to sell requires much labor and time, and since I have my garden planted and am out of debt on the venture, am planning to reduce the labor, so that I can devote more time to my flowers, and to the study of the care of the trees in regard to pruning, spraying, etc.

To this end I have set out more currant bushes, starting them from cuttings from the old bushes. These do not require much care, the fruit is easily picked and sells readily, and will supply the money necessary for running expenses, then I shall cut down the berry patch to family requirements.

Eventually, when my trees as well as myself have grown older, I expect to allow the grass to grow under them, forming a shady place in which to pass leisure time, thus completing the ideal of a garden, and while my friends and myself are enjoying the shade and the fruit and flowers, I shall by example as well as by precept be an advocate of the home garden.

STATE OF WISCONSIN

BOARD OF REGENTS

OF

NORMAL SCHOOLS

Educational and Financial Statistics

For Biennial Period 1912-13, 1913-14

MADISON, WISCONSIN
DEMOCRAT PRINTING COMPANY, STATE PRINTER
1914

DIRECTORY

BOARD OF REGENTS OF NORMAL SCHOOLS

REGENT EX OFFICIO.

C. P. CARY, State Superintendent.....Madison

REGENTS APPOINTED.

EDWARD J. DEMPSEY.....Oshkosh
CLOUGH GATES.....Superior
H. O. HAMILTON.....Whitewater
EMMET HORAN.....Eau Claire
THEODORE KRONSHAGE, JR.....Milwaukee
DUNCAN McGREGOR.....Platteville
GEORGE B. NELSON.....Stevens Point
P. W. RAMER.....River Falls
W. F. WOLFE.....La Crosse
MRS. THEODORA W. YOUMANS.....Waukesha

OFFICERS OF THE BOARD.

THEODORE KRONSHAGE, JR., President.
H. O. HAMILTON, Vice President.
WILLIAM KITTLE, Secretary.
HENRY JOHNSON, Treasurer.

STANDING COMMITTEES.

Executive—The President, Regents HAMILTON and HORAN.
Claims—Regents GATES, DEMPSEY and HORAN.
Courses of Study and Graduating Classes—Regents CARY, YOUMANS, RAMER, DEMPSEY, McGREGOR and HAMILTON.
Institutes—Regents CARY, YOUMANS and DEMPSEY.
Libraries—Regents YOUMANS, McGREGOR and RAMER.
Physical Training—Regents YOUMANS, HAMILTON and WOLFE.
Inspection and Appropriations—Regents NELSON, HAMILTON, RAMER and THE PRESIDENT.
Teachers—Regents McGREGOR, GATES and WOLFE.

SCHOOLS IN OPERATION.

Platteville, opened 1866.
Whitewater, opened 1868.
Oshkosh, opened 1871.
Superior, opened 1896.
River Falls, opened 1875.
Milwaukee, opened 1885.
Stevens Point, opened 1894.
La Crosse, opened 1909.

PRESIDENT'S REPORT.

His Excellency, FRANCIS E. MCGOVERN, *Governor:*

Sir: I have the honor to submith herewith, in accordance with law, my report for the biennial period ending June 30th, 1914.

In consequence of the increasing service and importance of the normal schools of Wisconsin, I shall divide my report into three parts,—the first dealing with the present activities of the normal schools, their present policies and their policies for the future; the second with the needs of the normal schools as related to public education; and the third with the more or less traditional and statistical aspects of the work during the past two years.

PART ONE.

A. COUNTRY SCHOOLS.

I first desire to direct your attention to what has been commonly called the "country school problem" and the part that the normal schools of the state have taken and desire to take in its solution.

Normal Schools are primarily vocational schools. From their development, and by law, their function is to train persons for a single profession—that of teaching school. This function is fundamental. The rise and development of the public school system of this State and the differentiation of services now demanded in the various kinds of school work are marking out the scope of normal school work and the policy which the State should pursue.

There are approximately sixty-six hundred (6,600) one-room rural schools in Wisconsin. About 1,900 new teachers enter these schools each year. For the training of these teachers six

normal schools, twenty-seven high schools and twenty-eight county training schools offer courses; but these three agencies combined graduated only 793 students during the school year ending June 30th, 1914. Hence, all the institutions established by localities and the State, furnish less than 42 per cent of the new teachers needed each year in the rural schools of the State.

Graduation from the eighth grade or from a country school is now required for admission to high schools, to county training schools and rural school courses in the normal schools. The high schools, however, require four years beyond the eighth grade for graduation from their rural school courses, while the county training schools and the rural school departments in the normal schools require only two years beyond the eighth grade for graduation.

It is apparent that the training offered by the high schools of the State to rural school teachers, assuming that such training in these non-functional schools is properly given and is not made a side issue, is superior to the training offered by the county training and normal schools. In any event, I submit that the training offered by each of these agencies is hopelessly insufficient.

The term "the country school problem", I believe, is misleading. In its broader sense the problem is this:

How can the migration of young men and young women, born and raised in rural communities, to the cities, be stopped and the congestion of population in urban centers be checked? It is a well known fact, established by the federal census and the census taken by various states in the middle west, that the rural population is decreasing and that the urban population is rapidly increasing. This fact presents one of the most important sociological and economic problems which the national government and the various states must soon solve.

I voice the sentiment of the Board of Regents of Normal Schools of Wisconsin when I say that the solution of this problem lies in making country life as livable as city life; in having country life afford opportunities for enjoyment and culture and advancement and financial success, at least approximately similar to those afforded in the larger cities. More than this, the problem must be solved largely through the country school.

Successful teaching in rural schools of the State of Wisconsin as well as of many other states, calls for a special education and

for teaching ability of the highest order. To train a young woman who is to teach one or two city grades, where she is assisted by constant supervision, where she has the aid of special instructors in domestic science, manual training, play ground work, etc., is a comparatively simple matter. To train a young woman to teach eight grades in a country schools with practically no supervision and without any assistance, is a most difficult thing. Yet the urban populations of this State quite generally demand that teachers in their elementary schools shall not only have had a high school education but shall also have taken a two year course in a normal school in addition. On the other hand, the county training schools and the rural school departments in the normal schools, offer the rural communities young men and women, who have taken courses but two years in advance of the eighth grade. The disparity of preparation is apparent.

The Board of Regents of Normal Schools of the State are desirous of establishing a specialized course, with high school graduation as an entrance requirement, for the training of teachers for the rural schools. Such a course would include special instruction in agriculture and agricultural manual training; in rural domestic science and domestic art; in farm bookkeeping and in ordinary farm finance; in home gardening and other kindred subjects closely connected with rural life; and most especially a course in what is commonly called social center work.

But the remedy for the country school situation does not lie wholly in this desire on the part of the Board of Regents of Normal Schools to establish such courses nor does it lie wholly in the hands of those who administer courses for the preparation of country school teachers. The extension of the existing courses, the raising of the entrance requirements of these courses or the establishment of the courses above outlined, would insure a better qualified set of teachers for the country schools, but the draining of this supply of teachers qualified for the country schools to the villages and cities of the State will continue, as at present, until the salary paid in country schools is more than commensurate with salary paid in villages and cities.

In other words, until the state has offered such inducements by way of state aid to rural districts and particularly to teachers, as will overcome the lure of the city, the country school

problem and the problem of the slowly vanishing rural population will still remain with us.

I beg leave to quote in this connection from a recent article contributed by Mr. Edward Alsworth Ross, Professor of Sociology in the University of Wisconsin, in a recent number of the Normal School Bulletin, published by this Board:

"It is too much to expect the country to hold its own when the city has better schools, better churches, better newspapers, better library facilities and more means of recreation; when the city people look down upon the farmers until the young people in the country become infected with the same folly. The gap between rural life and city life cannot be closed, but it must be narrowed. The movement for the betterment of our city life has been strong for 35 years; whereas the country life movement is hardly a dozen years old. Vastly more money per capita has been spent to make city life *wholesome* and *attractive* than to make country life *endurable*. Compare the amount of first class talent devoted to solving city school problems with that devoted to solving rural school problems. If I should wander into the city school I attended forty years ago, I should find everything better; but if I should stray into the district school I attended thirty-eight years ago, I should find it nearly the same.

Here and there country school teachers, instead of giving the children's minds a set away from farming, are actually educating them to be happy and to succeed on the farm. Let us make it our policy to do in all the rural schools what is being done in a few of them. This calls for more attention to the problem, for better organization, for better preparation of teachers, *for making rural teaching a distinct profession*, for making the teacher a civic secretary of a social center, for better pay that will bring stronger personalities into the work. As I see the situation here, *I would rather the next million dollars this State gives to education went to rural schools rather than to city schools, or high schools, or the University.* It may be unfair to spend taxes from city people in bettering the country as it is to spend taxes from country people in bettering the city. *But it is not so foolish.*"

I am in hearty accord with almost every statement in the above quotation.

In order to meet the crying need of the rural communities for better teachers, the Board of Regents of Normal Schools has already established a two year teachers' course in agriculture and agricultural manual training and domestic science at the normal schools located at River Falls and Platteville. It has also established three year courses designed to train supervisors and teachers of agriculture and agricultural manual training and domestic science at both River Falls and Platteville, and also

two and three year courses designed to train supervisors and teachers of domestic science at Stevens Point. Although the experience of the Board, owing to the comparative recent establishment of these courses, is still meagre, it is quite apparent that the graduates of these courses will, as heretofore, be assimilated by the cities of the State.

I believe that the entire solution of this so-called "problem" lies in the granting of liberal state aid along the lines of additional salary to be paid to the teacher who has completed a two year rural school course with the high school graduation as an entrance requirement.

The Legislature of 1913 made the following provisions, (Sectnon 560g—1, 2 (a):

"The secretary of the State shall then draw his warrant upon the state treasurer for the several claims of said rural schools, made payable to the treasurer of the district or corporation maintaining such approved school, and such sums shall be apportioned by said district treasurer direct to each teacher qualified as herein provided and employed in such rural school, as additional compensation, as follows:

To each first grade school as designated herein and which has been taught by a graduate of the teachers' course at the University of Wisconsin, a Wisconsin State Normal School, or other equivalent school, as determined by the State Board of Examiners, or the holder of a life certificate, and who has had at least one year of successful teaching experience, and has taught an efficient school during the year for which aid is demanded, ten dollars per month for each such teacher."

This enactment was an important step in the right direction. However, it falls far short of what is needed to help out the country school situation. In the first place, the enactment is too broad. The great majority of the students of the State normal schools are being especially trained to teach in a limited number of grades in the city schools. They are being taught nothing of rural school conditions and know nothing of rural school problems. I say again in the language of Professor Ross, that in order to solve the rural school problem it is necessary to make "*rural teaching a distinct profession*". The ordinary graduate of a normal school or of any other school, professional or secondary, has not been fit ted for rural school training. Probably the farthest removed in the line of fitness is a graduate of the State University because the particular training of the latter has been devoted to the teaching of high school subjects.

In view of what has been said, I therefore respectfully submit the following:

First: By reason of the large demand for country school teachers the existing rural school courses as given by the normal schools, the county training schools and high schools, should be continued with this proviso; that, beginning with July 1st, 1915, the entrance requirement of courses now given in the normal schools and county training schools shall be equivalent of entrance requirements of the second year of a four year high school, as now virtually provided by Section 450d of the Statutes; and this additional proviso: that beginning with July 1st, 1917, the entrance requirements of such courses shall be the equivalent of the entrance requirements of the junior year of a four year high school.

Second: Section 560g—1. 2. (a), should be amended so that teachers, who are graduates of a high school giving a four year course and a special two year rural school course of a normal school, as previously suggested, shall during the year for which aid is demanded by the district, receive fifteen dollars per month in addition to the salary paid by such district and after the completion of two years of successful teaching shall receive twenty dollars in addition to the salary paid by such district.

Third: Courses in agriculture, forge and bench work, domestic science and art, and bookkeeping should be among the most important in the rural school. No young man or woman in a two year's course of instruction in a normal school, subsequent to high school graduation, can learn how to teach the elementary branches and also become sufficiently efficient in the subjects above named to satisfy the demands of the upper grades of any country school. At the same time it is beyond the means of almost every rural community in the State to hire special teachers in these branches. Nor would such special teachers find constant employment in any one district. It therefore seems to me that it would be a matter of economy on the part of the State to provide some means through which instruction in these highly specialized branches in the upper grades might be given under the supervision and direction of the county school superintendent through persons elected by the county boards of education of the various counties. With this end in view, the state should extend a certain amount of state aid to each county where special supervisors and instructors in agriculture, domestic science and other special subjects are employed.

The enactment of these suggestions into law would, I believe, bring the following results:

1. A large number of high school graduates would enter the rural school courses of the normal schools.

2. School districts would take advantage of the state aid offered and would engage the services of the graduates of these courses.

3. A mature and specially trained body of young men and women would gradually take the place of the immature and insufficiently trained persons who now largely constitute the teaching force of the rural schools.

4. The practical work done by the special teachers would result in holding the older pupils in the schools and in creating on the part of the rural communities a greater respect for their schools.

At first blush, it may seem that the program above outlined would call for large expenditures of the State's money. It should, however, be remembered that after any legislation is had along the lines indicated, it would take practically three years before there would be any teachers in the field who would fall within the provisions of the law; and that in spite of the liberal state aid offered, the number of districts and teachers to whom such state aid would be awarded would grow slowly.

B. ELEMENTARY AND HIGH SCHOOLS.

The public schools of Wisconsin, not including the one-room rural schools, employed during the school year 1913-1914, nine thousand two hundred seventy-three teachers. Of this number 1,414 were superintendents and principals, 2,331 were high school teachers and teachers of special subjects, and 5,528 were teachers in the elementary graded schools.

(a) Of the 1,414 principals and superintendents;

651 are graduates of Wisconsin Normal Schools.
127 are graduates of the University of Wisconsin.
61 are graduates of other Wisconsin Colleges.

(b) Of the 2,331 high school teachers and teachers of special subjects:

620 are graduates of Wisconsin Normal Schools.
536 are graduates of the University of Wisconsin.
365 are graduates of other Wisconsin Colleges.
98 are graduates of Stout Institute.

(c) Of the 5,528 teachers in the elementary graded schools:

3073 are graduates of Wisconsin Normal Schools.
33 are graduates of the University of Wisconsin.
32 are graduates of other Wisconsin Colleges.
31 are graduates of Stout Institute.

Because of the large demand made by the public schools of the State of Wisconsin on the normal schools for the furnishing of teachers not only for the elementary grades, but also for high schools, and the furnishing of principals and superintendents, the Board of Regents in February, 1913, with a view of increasing the efficiency of the work of its graduates in the field, established the following departments in each one of the normal schools of the State:

1. A primary department offering a course of two years beyond a high school for the training of teachers in grades one to four inclusive.
2. A grammar grade department offering a course of two years beyond a high school, for the training of teachers in grades five to eight and a special course of two years beyond a high school for the training of principals of grade schools.
3. A high school department offering a three year course beyond a high school for the training of teachers and a three year course for the training of principals of high schools.

These departments will enable the normal schools to prepare teachers more effectively for the work in public schools by means of differentiated courses.

C. THE TEACHING OF SPECIAL SUBJECTS.

To meet the demands of the public schools of the State, it has become the policy of the Board to establish from time to time, at different normal schools, two or three departments for the training of teachers in special subjects. Such departments now established are as follows:

1. Six rural school departments (already mentioned) one each at La Crosse, Oshkosh, Platteville, River Falls, Stevens Point and Whitewater.
2. Two kindergarten departments, one at Milwaukee and one at Superior.
3. An industrial educational department at Oshkosh, established with a view of meeting the large demand for teachers in industrial arts on the part of the high schools and continuation schools of the state.
4. A manual training department at Platteville.

5. A department of drawing and hand work at Milwaukee, established with a view of furnishing supervisors and teachers of drawing and hand work in the public schools of the state.

6. A department for the training of teachers for the deaf at Milwaukee.

7. A department for the training of teachers of music at Milwaukee.

8. A department for the training of teachers of physical education and play ground work at La Crosse.

9. Two departments for the training of teachers of agriculture and allied subjects, one each at Platteville and River Falls.

10. A department for the training of teachers of domestic science and domestic arts at Stevens Point.

11. A department for the training of teachers of commercial branches at Whitewater, established to meet the large demand for teachers of commercial subjects on the part of the high schools of the state.

These last named eighteen special departments are all for the purpose of training teachers in their respective lines. During the year just closed they enrolled 934 students and furnished 251 graduates. They are rendering a most important service to the State.

D. THE BUSINESS DEPARTMENT.

The large growth in attendance at the different normal schools during recent years has necessitated the relegation of the power of purchasing supplies and materials at each of the eight different plants and the centralization of such purchasing power in the office of the Board in the City of Madison. Shortly following the last session of the state legislature the Board established a business department at its office, the need of which had been felt for many years. A business or purchasing agent and an accountant were engaged and a thorough system of buying and of bookkeeping was installed.

I will cite a few instances of the activities of this new department.

In all the history of the normal school system there had never been what could be called an inventory of its physical property. It is true that, from time to time attempts had been made, but the best of them were very incomplete and lacked uniformity.

No one with business experience questions the necessity of having reliable inventories. It is a primary necessity to any business, and where there are several plants, as there are in the

normal school system, it is essential that such inventories should be taken along one general plan.

Before establishing this department we had received estimates from several appraisal companies as to the cost of such an inventory and the estimates ran all the way from five thousand dollars to ten thousand dollars. Any one acquainted with the vast amount of detail work connected with the inspection, classification and valuation of the property of plants similar to the schools of the normal school system, knows that these estimates of cost are not violently disproportionate to the work involved.

To make an inventory of the physical property of the normal school system was one of the first activities of the business department and this inventory cost the State about seven hundred dollars.

In the rapid march of science, it frequently occurs that plants are provided with equipment which has become wasteful. The business department found, for instance, that there were about five thousand carbon lights in use in the various normal schools. These carbon lights consume about two and one-half times as much current as tungsten lamps and the life of a tungsten lamp is considerably longer. These carbon lamps have all been discarded and the tungsten lamps put in.

When institutions have grown to the size to which the normal school system has grown, and especially when the plants of such system are scattered, the buying of supplies and materials needs careful supervision. This fact is recognized in all modern business. The Presidents have so many duties to perform that it is impossible for them or their office assistants to devote sufficient time to this phase of the administration of the schools, in order to insure the purchase of the best materials at the lowest prices. Nor could the administrative department of any single school have an opportunity to compare the prices paid by other schools. During the current year the saving accomplished by the business department of the Board in the matter of coal alone, will exceed two thousand dollars.

It is pertinent to add that the purchasing agent is now engaged in the standardization of all materials and supplies used in the normal schools which can profitably be standardized and will from time to time purchase such standardized supplies and materials for all the normal schools from the lowest bidders.

The Board of Regents anticipates a large net saving to the State when purchases are made in this manner.

E. THE ACCOUNTING SYSTEM.

The 1913 Legislature made appropriations to each school for three purposes,—Operation, Maintenance, and Capital, thereby recognizing the three elements and purposes of expenditure which are recognized in the business world. To carry out the legislative intent more completely, the Board at its annual meeting, July 15-18, 1913, ordered that a scientific accounting system be organized and employed an accountant to carry this out.

The system which has been developed since that time recognizes fully these three classes of expenditure. The basis is the numbered classification of accounts, which are grouped under the following summary accounts:

1. Capital Assets.
2. Floating Assets.
3. Liabilities.
4. State of Wisconsin—Surplus.
5. Revenues.
6. Operation.
7. Maintenance or Repairs and Replacements.

It may be noted that the summary accounts, Capital Assets, Operation, and Maintenance include all expenditures of the Board, and since they coincide with the legislative appropriations, enable the Board to effectually carry out the legislative intent and render intelligent reports to that body. The summary accounts,—Capital Assets, Floating Assets, Liabilities, and Surplus, include all items which should appear in a balance sheet. Revenues, Operation and Maintenance include all transactions incidental to the regular and recurring activities of the several normal schools.

Under this classification a budget is prepared for the ensuing year at each annual meeting and the expenditures of the schools are limited to the amounts appropriated by the Board under each of some forty-five accounts. Since the adoption of the central purchasing system, requisitions are charged against the several Board appropriations *before* an order is placed, so that charges against such appropriations always include orders outstanding.

The system is so organized that monthly reports are made to the regents and normal school presidents showing the transac-

tions for the month and the balances both in appropriations made by the legislature and those made by the Board budget. The statement of expenditues for 1913-1914 reported on pages 24–25 is under this present classification.

The system is also designed to carry the property in the possession of the Board on its books as Capital Assets. With valuations shown in the inventory of normal school properties, the Board for the first time is carrying such values on its books and has issued its first balance sheet which appears on page 30 of this report. This shows the surplus or equity of the state in the normal school system to be some two and a third million dollars.

PART TWO.

THE NEEDS OF THE NORMAL SCHOOLS.

The attendance in the normal departments of the normal-schools for the year 1912-13 was 3,584 and for the year 1913-14, 3,901. The details are shown in a table printed on page 17 of this report. The enrollment in the various normal schools in September, 1914, indicate that the total enrollment for the year 1914–15 will exceed forty-five hundred.

This increase in attendance will necessitate a large additional appropriation to the normal school system for operating expenses At the present time, without all the details before me, I estimate that an additional appropriation for operation of $175,000 a year will be required during the next biennium.

In addition to an increased appropriation for operation, it will also be necessary to provide increased appropriations for maintenance, and particularly for capital expenditures. Should the present rate of increase continue, the normal school system in its normal school departments will have to exceed fifty-five hundred students before the close of the fiscal year 1917. These students will not only require teachers, but will also require books, apparatus and school rooms. The approximate amount needed for these purposes will be more properly the subject for consideration on the part of the next State Legislature.

In addition to what will be needed to provide for the increased

attendance at the various schools, some provision will have to be made to replace some of the older buildings of the normal school system.

At Oshkosh the main building, which was donated to the State, is still in use. It has had numerous additions. Each addition was put on to meet only immediate requirements. All the earlier additions were of cheap construction. The result is that it is one of the poorest school buildings in the State. There is great need for a new building. But, as the school has to be in session while the building is replaced the rebuilding will have to be done in sections. The Legislature of 1913 appropriated One Hundred Thousand Dollars to become available on March 1st, 1915, with which to begin this rebuilding. The Legislature of 1915 should make a similar appropriation available in 1916 and 1917, in order that the work may properly be carried forward.

The Whitewater normal school has this year enjoyed an unprecedented growth. The greater portion of the building occupied by this school is among the oldest of educational structures in the state. During the past few years the maintenance, that is to say, the upkeep, of this building has been very expensive. Portions of it should be replaced at an early date. Much of what has been said concerning the Oshkosh school will apply to the school at Whitewater.

Improvements should be made at other schools. New plumbing and new wiring should be installed at Stevens Point. The school at Platteville requires changes too numerous to set out in this report. The same is true of the old building at River Falls.

The Milwaukee Normal School is taxed beyond its capacity and an addition has become absolutely necessary.

At Superior the school building was destroyed by fire early in 1914. A considerable additional appropriation will be required to complete this school according to the plans adopted by the Board, which contemplate a thoroughly fire proof construction of the reinforced concrete skeleton type.

During the biennium a new thoroughly fire proof building has been erected at River Falls at a cost of $124,000 to the State. An addition to the Stevens Point normal school is in course of construction at a contract price of $70,378.00.

The concrete skeleton for the new normal school at Eau Claire has been completed. The building will be ready for occupation before September, 1916. The Legislature of 1915 will be called

upon to make the necessary appropriations for the equipment of the building and for the operation of the school.

Pursuant to appropriations made by the Legislature of 1913, the Board has had and is having plans prepared for new buildings at La Crosse and Whitewater; for an agricultural building at Platteville, for a new building to replace an old portion of the present Oshkosh normal school, and for a dormitory at Stevens Point.

Provision has been made by the Legislature for but two dormitories for the normal school system. One already built and located at Superior and another about to be built at Stevens Point. I recommend that provision be made for additional dormitories to be located as the Board of Regents or as the Legislature may direct.

The needs of each school will be submitted in greater detail to the next Legislature by means of carefully itemized printed estimates.

PART THREE.

EDUCATIONAL AND FINANCIAL STATISTICS

TOTAL ENROLLMENT OF STUDENTS.

Schools 1912-1913.	Normal department.	Training school.	Totals.
La Crosse	401	200	601
Milwaukee	838	425	1,263
Oshkosh	520	252	772
Platteville	310	186	496
River Falls	390	165	555
Stevens Point	353	219	572
Superior	474	229	703
Whitewater	298	226	524
Totals	3,584	1,902	5,486
1913-1914.			
La Crosse	449	207	656
Milwaukee	912	438	1,350
Oshkosh	547	265	812
Platteville	285	152	437
River Falls	478	258	736
Stevens Point	405	239	644
Superior	513	235	748
Whitewater	312	227	539
Totals	3,901	2,021	5,922

NUMBER OF GRADUATES IN TWO YEARS.

Year,	1912-1913.				1913-1914.			Totals.				
Course.	Diplomas.	Elementary certificates.	Rural school certificates.	College Course certificates.	Diplomas.	Rural school certificates.	College Course certificates.	Diplomas.	Elementary certificates.	Rural school certificates.	College Course certificates.	All courses.
La Crosse	93	5	21	11	115	23	10	208	5	44	21	278
Milwaukee	273	.....	.....	8	254	.....	15	*527	.....	.....	23	550
Oshkosh	168	.....	20	3	166	18	2	334	.....	38	5	377
Platteville	83	2	.....	.....	82	.....	1	165	2	.....	1	168
River Falls	58	5	22	.....	93	41	.....	151	5	63	.....	219
Stevens Point	85	19	6	1	100	20	.....	185	19	26	1	231
Superior	107	.....	.....	.....	132	.....	15	*239	.....	.....	15	254
Whitewater	81	11	19	1	71	21	2	152	11	40	3	206
Total	948	42	88	24	1,013	123	45	1,961	42	211	69	2,383

*Including 89 kindergarten diplomas at Milwaukee and 36 at Superior.
*Including 4 diplomas for Department of the Deaf at Milwaukee.
*Including 8 diplomas for Art Department at Milwaukee.

TOTAL NUMBER OF GRADUATES. (NONE COUNTED TWICE.)

Schools.	When Opened.	Course.				Totals.
		Diplomas.	Elementary.	Rural School.	College Course.	
La Crosse	1909	376	29	76	21	502
Milwaukee	1885	3,587	.....	.....	23	3,610
Oshkosh	1871	2,024	946	64	5	3,039
Platteville	1866	1,465	204	.....	1	1,670
River Falls	1875	739	444	70	.....	1,253
Stevens Point	1894	846	612	26	1	1,485
Superior	1896	902	185	.....	15	1,102
Whitewater	1868	1,252	800	59	3	2,114
Totals	.....	11,191	3,220	295	69	14,775

The following table shows the number of teachers and employes for the year 1913–1914:

NUMBER OF TEACHERS AND EMPLOYES.

Normal.	Teachers in Normal Departments.		Teachers in training schools	Librarians and assistants.	Clerks.	Janitors and assistants.	Engineers and assistants.	Total.
	Men.	Women.						
La Crosse	18	9	8	2	2	3	1	43
Milwaukee	22	23	18	4	5	4	3	79
Oshkosh	21	14	10	2	3	4	2	56
Platteville	*11	9	6	2	1	2	1	32
River Falls	14	7	6	2	1	.....	*1	31
Stevens Point	14	9	7	2	2	1	1	36
Superior	12	12	8	2	2	4	1	41
Whitewater	14	9	7	2	1	2	1	36
Total	126	92	70	18	17	20	11	354

*Janitor and engineer combined.

CONDITION OF NORMAL FUND, JULY 1, 1914.

State certificate of indebtedness		$515,700 00
Loans on land contracts		365 00
Individual loans		1,150 00
Bonds		239,050 00
School district loans	$249,760 51	
Special loans	878,258 78	
		1,128,019 29
Total Productive fund		$1,884,284 29
Cash in treasury		73,669 57
Total Normal Fund		$1,957,953 86

NORMAL SCHOOL LANDS UNSOLD JULY 1, 1914.

Description.	S.	T.	East R.	Acres.	Appraised value.	County.
Lot 9, Block 19, in W. N. Dennis Add. to city of Watertown					$300 00	Dodge.
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.
se se	31	28	17	40	36 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				160	$678 00	

RECEIPTS TO NORMAL FUND INCOME, 1912-1913 AND 1913-1914.

	1912-13.		1913-14.	
Collections at normal schools		$74,455 27		$80,611 29
Collections at Crownhart Hall	$15,109 55			
Deduct receipts of July 1 and 7, 1913, which were included in 1912-13	171 35			15,518 85
		14,938 20		
Normal school bureau fees		405 00		471 00
Transfers from Insurance Fund:				
Superior			$84 80	
Platteville			330 00	
Superior			94,500 00	
				94,914 80
Transfers from General Fund:				
Institute fund	$5,142 65			
Sec. 406a—2, W. S. 1911	210,808 82		$23,000 00	
Sec. (172—54) 32, W. S. 1913			304,890 00	
		215,951 47		327,890 00
Interest:				
State deposits	$1,642 15		$2,015 26	
Certificates of indebtedness	36,099 00		36,099 00	
Bonds	9,001 82		9,545 21	
Special loans and school district loans	38,890 58		37,467 33	
Land contracts	61 14		28 70	
		85,694 69		85,155 50
Annual Tax Levy:				
Remission of 1912	$193,380 67			
Remission of 1913	250,000 00		$223,605 00	
Levy of 1914			499,700 17	
		443,380 67		723,305 17
Sales				300 00
Refunds		543 65		63 45
Total		$835,368 95		$1,328,230 06
Less refund of interest overpaid				1 64
Net receipts		$835,368 95		$1,328,228 42
Balance on hand July 1		96,703 23		5,469 68
Gross receipts		$932,072 18		$1,333 698 10
Deduct disbursements:				
Proceedings of semi-annual meeting—February	$440,631 48		$409,628 02	
Proceedings of annual meeting—July	477,488 72		666,192 20	
Insurance premium transfer	8,482 30		4,416 33	
			$1,080,236 55	
Audit of July 18, 1913, not included in 1912-13 proceedings			1,738 77	
			$1,081,975 32	
Deduct audit of June 27, 1914, not paid until after July 1, '14			20,405 48	
		926,602 50		1,061,569 84
Balance June 30, carried forward		$5,469 68		$272,128 26

SCHEDULE OF CLASSIFIED EXPENDITURES FOR ANNUAL PERIOD ENDING JULY 18, 1913.

Buildings, Fixtures, Grounds, Furniture.	La Crosse.	Milwaukee.	Oshkosh.	Platteville.	River Falls.	Stevens Point.	Superior.	White-water.	Totals.
1. Additions and Improvements:									
(a) Buildings	$86 60	$107,301 88	$47,225 30	$1,141 84	$199 86	.....	$63,976 99	$25,102 08	$245,034 55
(b) Fixtures	330 82	966 78	213 63	97 03	14 71	$36 17	956 64	303 86	2,919 64
(c) Grounds	7,041 07	1,081 15	37 50	703 21	2,391 66	174 07	818 31	848 70	13,095 67
(d) Furniture and furnishings	1,452 49	7,341 57	1,066 52	2,108 05	1,348 17	974 59	3,850 77	1,362 77	19,504 86
Total	$8,910 98	$116,691 38	$48,542 95	$4,050 13	$3.954 40	$1,184 83	$69,602 71	$27,617 34	$280,554 72
2. Operation of Buildings, Fixtures and Grounds:									
(a) Wages of janitor	$1,820 00	$2,809 26	$1,983 72	$1,512 80	$962 91	$1,128 58	$1,782 00	$1,560 75	$13,560 02
(b) Wages of engineer	1,100 00	1,445 00	1,716 88	960 00	660 00	939 40	1,220 00	997 50	9,038 78
(c) Miscellaneous supplies	735 99	453 55	503 81	253 49	150 88	248 34	298 58	222 08	2,866 72
(d) Miscellaneous expense	31 10	343 70	40 00	149 00	526 50	77 20	61 74	150 92	1,380 16
(e) Repairs and replacements	145 36	1,192 75	1,036 84	686 72	1,076 03	1,025 58	742 00	559 61	6,464 89
Total	$3,832 45	$6,244 26	$5,281 25	$3,562 01	$3,376 32	$3,419 10	$4,104 32	$3,490 86	$33,310 57
3. Operation of Furniture and Furnishings:									
(a) Miscellaneous expenses	$59 40	$389 90	$18 61	$90 38	$51 52	$21 03	$5 74	$22 11	$658 69
(b) Repairs and replacements	17 00	194 00	93 34	34 00	89 85	167 02	13 10	27 19	635 50
Total	$76 40	$583 90	$111 95	$124 38	$141 37	$188 05	$18 84	$49 30	$1,294 19
4. Undistributed Building and Educational Costs:									
(a) Fuel	$2,457 35	$3,289 06	$4,484 94	$2,682 37	$1,803 57	$2,273 03	$2,918 62	$2,564 44	$22,473 38
(b) Light and power	2,201 00	2,199 15	320 52	422 80	558 90	538 14	576 79	529 06	7,346 36
(c) Water	260 54	350 96	233 24	450 77	210 00	859 53	333 73	500 00	3,198 77
(d) Telephone and telegraph	250 71	296 14	144 39	94 55	77 30	72 33	133 90	58 42	1,127 74
(e) Miscellaneous	.....	3 24	.....	.....	.....	.....	.....	25 00	28 25
Total	$5,169 60	$6,138 56	$5,183 09	$3,650 49	$2,649 77	$3,743 03	$3,963 04	$3,676 92	$34,174 50

SCHEDULE OF CLASSIFIED EXPENDITURES FOR ANNUAL PERIOD ENDING JULY 18, 1913—Continued.

Educational System.	La Crosse.	Milwaukee.	Oshkosh.	Platteville.	River Falls.	Stevens Point.	Superior.	Whitewater.	Totals.
1. Additions and Improvements:									
(a) Educational apparatus	$3,912 59	$5,442 12	$17,590 56	$3,970 60	$3,656 12	$3,821 61	$3,479 93	$3,834 35	$45,707 88
(b) Reference books	1,068 40	1,614 66	855 58	616 66	711 72	621 40	804 45	782 51	7,075 38
(c) Museum	.....	.....	.....	75 00	.....	.....	.....	.....	75 00
Total	$4,980 99	$7,056 78	$18,446 14	$4,662 26	$4,367 84	$4,443 01	$4,284 38	$4,616 86	$52,858 26
2. Operation of Educational System:									
(a) Wages of librarians	$1,695 00	$2,875 00	$2,042 88	$1,515 00	$1,637 44	$1,542 07	$1,614 86	$1,532 00	$14,454 25
(b) Wages of clerk	1,535 00	2,659 00	1,750 00	790 95	1,087 95	1,300 00	1,500 00	1,030 00	11,652 90
(c) Salaries of teachers	52,312 00	77,504 74	71,085 34	40,031 25	40,097 50	44,823 11	45,762 00	42,858 50	414,474 44
(d) Miscellaneous supplies	1,148 10	1,986 66	2,227 03	1,099 30	1,863 36	1,450 25	1,305 13	881 32	11,961 15
(e) Printing	110 55	532 12	292 87	136 94	309 33	202 63	149 65	105 53	1,839 62
(f) Stationery supplies	86 35	150 26	96 55	23 30	111 81	58 46	82 67	56 89	666 29
(g) Postage	200 16	319 70	371 72	196 08	396 27	165 92	225 21	156 85	2,031 91
(h) Text books	1,459 26	1,405 75	1,017 12	830 07	1,076 24	609 52	878 38	581 58	7,857 92
(i) Fuel and power for domestic science and manual training	.....	.....	153 27	38 92	119 24	143 00	.....	.....	454 43
(j) Miscellaneous expense	969 48	1,246 07	1,543 21	849 23	1,032 14	1,094 75	1,096 04	910 28	8,741 20
(k) Repairs and replacement of apparatus	.....	11 70	3 75	14 02	34 90	117 50	.....	.....	181 87
(l) Repairs and replacement of reference books and museum	.....	146 76	135 55	41 53	138 01	115 80	95 95	34 45	708 05
Total	$59,515 90	$88,837 76	$80,719 29	$45,566 59	$47,904 19	$51,623 01	$52,709 89	$48,147 40	$475,024 03
Refund of tuition	.....	$45 00	$49 56	.....	$15 00	$29 00	$5 00	$7 00	$150 56

SUMMARY OF CLASSIFIED EXPENDITURES FOR ANNUAL PERIOD ENDING JULY 18, 1913.

	La Crosse.	Milwaukee.	Oshkosh.	Platteville.	River Falls.	Stevens Point.	Superior.	White-water.	Totals.
Additions and improvements to buildings, fixtures, grounds, furniture and furnishings	$8,910 98	$116,691 38	$48,542 95	$4,050 13	$3,954 40	$1,184 83	$69,602 71	$27,617 34	$280,554 72
Operation of buildings, fixtures and grounds	3,832 45	6,244 26	5,281 25	3,562 01	3,376 32	3,419 10	4,104 32	3,490 86	33,310 57
Operation of furniture and furnishings	76 40	583 90	111 95	124 38	141 37	188 05	18 84	49 30	1,294 19
Undistributed building and educational costs	5,169 60	6,138 56	5,183 09	3,650 49	2,649 77	3,743 03	3,963 04	3,676 92	34,174 50
Operation of dormitory							13,004 73		13,004 73
Additions and improvements to educational apparatus, reference books and museum	4,980 99	7,056 78	18,446 14	4,662 26	4,367 84	4,443 01	4,284 38	4,616 86	52,858 26
Operation of educational system	59,515 90	88,837 76	80,719 29	45,566 59	47,904 19	51,623 01	52,709 89	48,147 40	475,024 03
Wisconsin School of Arts		7,208 00							7,208 00
Refund of tuition		45 00	49 56		15 00	29 00	5 00	7 00	150 56
Totals	$82,486 32	$232,805 64	$158,334 23	$61,615 86	$62,408 89	$64,630 03	$147,692 91	$87,605 68	$897,579 56

Cost of Teachers' Institutes:		
For incidentals	$473 76	
For conductors' expenses	631 39	
For conductors' salaries	4,037 50	
		$5,142 65
Operation of Administrative Office:		
Furniture, fixtures, furnishings	$232 66	
Salaries	5,872 15	
Per diem of regents	1,415 00	
Printing	3,089 05	
Stationery supplies	86 91	
Postage	294 34	
Official visitors	255 71	
Traveling expenses of Board	2,330 30	
Telephone and telegraph	74 68	
Expressage	71 85	
Miscellaneous expense	1,236 66	
Grounds at Eau Claire	1,079 89	
		$16,039 20
Total expenditures July 1, 1912, to July 18, 1913		$918,761 41

TOTAL EXPENDITURES—JULY 18, 1913 TO JULY 1, 1914.

Including all bills for goods or services used during the period, outstanding July 1, 1914.

		La Crosse.	Milwaukee.	Milwaukee Deaf School.	Oshkosh.	Platteville.	River Falls.	Stevens Point.	Superior.	Whitewater.	Total.
1	**Capital Expenditures: Total**	$12,310 69	$138,179 39	$891 34	$99,750 71	$11,044 74	$70,646 66	$4,158 95	$33,261 10	$9,392 32	$379,635 90
111	Land		101,370 02		22,143 98	5,500 00	13,035 75			2,025 00	
112	Land Improvements	993 28	26,043 92		428 00	31 25		1 70	1,001 05	6,313 98	
12	Buildings and Fixtures	281 98	1,360 06		61,917 68	536 80	53,980 23	7 80	27,954 31	28 11	
13	Machinery	159 70	30 51		96 92	1,713 75	1,003 75	1,637 50		3 35	
14	Educational Apparatus	4,790 97	4,495 36	199 43	9,198 10	1,542 22	1,429 99	885 58	1,846 10	384 74	
15	Furniture and Furnishings	3,142 68	2,411 63	502 44	4,803 97	1,114 33	847 23	1,131 79	1,585 55	426 09	
16	Hand Tools	38 91	61 79		10 50	42 91		7 05	15 25	1 50	
17	Library	1,337 73	2,406 10	189 47	975 96	563 48	349 71	487 53	858 84	209 55	
18	Museum	1,565 44			175 60						
7	**Maintenance: Total**	480 15	5,345 94	9 55	3,641 55	3,414 47	2,055 30	2,868 86	8,659 74	1,437 23	27,912 79
71	Land and Land Improvements	47 01	101 13			41 84	32 20	37 15	3 88	614 07	
72	Buildings and Fixtures	322 11	3,830 32		1,881 43	797 20	1,490 99	1,525 77	7,852 11	709 45	
73	Machinery	20 53	244 71		401 67	733 67		1,141 64	459 57	44 96	
74	Educational Apparatus	28 52	97 12		172 20	715 13	36 31	25 72	84 74	19 95	
75	Furniture and Furnishings	25 20	308 52		804 63	854 40	352 75	10 17	156 75	20 50	
76	Hand Tools	1 98	3 45		1 70					3 15	
77	Library	34 80	760 69	9 55	333 33	246 33	143 05	128 41	102 69	25 15	
78	Museum				46 59	25 90					
6	**Operation: Total**	77,893 85	122,290 47	2,963 69	104,439 94	59,711 71	58,400 96	63,836 68	69,786 78	62,678 27	622,003 35
61	*Administration*	*7,776 18*	*10,946 61*	*106 80*	*8,250 11*	*6,310 26*	*6,097 98*	*6,585 84*	*7,356 33*	*6,220 63*	*59,650 04*
611	Salaries of Officers	4,250 00	5,000 00		4,500 00	4,000 00	4,000 00	3,989 00	4,226 00	4,000 00	
612	Salaries of Clerks and Stenographers	1,801 80	3,850 23	57 00	2,301 17	1,077 38	1,168 50	1,320 00	1,747 50	1,159 20	
613	Traveling Expenses	345 04	300 29		210 87	201 35	216 10	257 43	294 85	252 05	
614	Stationery and Office Supplies	220 20	495 03	34 30	231 09	81 18	126 67	370 31	254 40	118 19	
615	Postage	254 05	380 64	10 00	245 00	194 03	338 95	220 75	212 70	218 87	
616	Telephone and Telegraph	226 99	352 11		144 42	165 19	81 43	80 61	131 55	72 60	
617	Express, Freight and Drayage	339 68	169 64		218 72	237 25	154 40	126 35	171 94	82 35	
618	Printing	316 62	341 01	5 50	369 99	353 88	8 93	221 39	306 64	251 98	
619	Sundry Supplies and Expenses	21 80	57 66		28 85		3 00		10 75	65 39	

62	*Physical Plant:*	8,456 45	11,842 30	.....	12,492 99	7,752 98	3,998 62	6,696 00	7,753 01	6,599 45	65,591 80
6211	Salaries of Engineers	1,200 00	1,801 68	.....	2,088 00	1,120 00	685 00	1,049 75	1,200 00	1,100 00	.....
621	Salaries of Janitors	2,100 00	3,070 34	.....	2,747 75	1,917 07	997 76	1,150 02	2,578 07	1,689 90	.....
6221	Fuel	2,406 68	3,599 56	.....	6,190 82	3,196 30	1,315 83	2,707 25	2,736 57	2,524 16	.....
6222	Light and Power	2,037 70	2,360 18	.....	272 79	506 00	454 23	649 93	602 05	518 22	.....
6223	Water	147 38	318 61	.....	267 66	375 38	108 50	629 58	254 31	500 00	.....
623	Sundry Supplies	550 86	291 53	.....	827 92	432 62	305 81	380 81	318 76	187 15	.....
624	Sundry Expenses	13 83	400 40	.....	98 05	205 61	131 49	128 66	63 25	80 02	.....
63	*Instruction:*	54,487 99	88,379 78	2,847 04	72,291 01	38,919 08	42,302 56	43,861 81	47,768 01	43,213 98	434,071 26
631	Salaries of Teachers	51,898 00	83,631 25	2,540 00	66,723 13	36,542 63	37,978 15	41,261 32	43,845 97	41,826 00	.....
632	Text Books	1,190 28	2,048 79	302 54	2,140 17	770 27	1,078 68	758 53	2,169 33	427 84	.....
633	Fuel and Power for Instruction	.....	79 42	.....	26 40	42 00	108 26	27 90	.....	4 05	.....
634	Sundry Supplies	1,399 71	1,561 81	.....	2,619 68	1,432 08	1,798 81	1,743 47	1,601 72	678 01	.....
635	Sundry Expense	.....	1,058 51	4 50	781 63	132 10	1,338 66	70 59	151 69	278 08	.....
64	*Library:*	2,000 38	3,335 76	9 85	2,296 06	2,341 71	1,961 48	1,764 25	2,015 60	1,791 55	17,516 64
641	Salaries of Librarians	1,700 00	2,785 60	.....	1,905 11	2,066 45	1,686 76	1,523 70	1,801 80	1,533 92	.....
642	Newspapers and Periodicals	247 83	482 91	9 85	337 70	220 90	260 72	202 00	191 30	208 33	.....
643	Sundry Supplies and Expenses	52 45	67 25	.....	53 25	54 36	14 00	38 55	22 50	49 30	.....
65	*Student Welfare:*	506 60	1,628 21	.....	635 00	668 35	359 73	735 94	511 63	1,110 19	6,155 65
651	Student Health	.....	630 00	.....	.....	.....	.....	.....	.....	205 25	.....
652	Entertainment and Lectures	149 75	231 10	.....	135 00	120 00	.....	200 00	.....	51 59	.....
653	Athletics	330 60	767 11	.....	500 00	498 35	273 08	474 28	501 63	618 47	.....
654	Organizations	26 25	.....	.....	.....	50 00	86 65	61 66	10 00	234 88	.....
66	*Summer Session*	4,033 05	5,449 81	.....	7,617 34	3,300 83	3,360 84	3,727 49	4,035 90	3,237 57	34,762 83
67	**Insurance*	619 20	653 40	.....	851 43	418 50	294 75	451 35	345 60	504 90	4,139 13
68	*Undistributed Expenses*	14 00	54 60	.....	6 00	.....	25 00	15 00	.....	.....	114 60
	Bills outstanding July 1, 1913—Charged to Accumulated Balance	10,167 63	2,819 03		2,572 84	1,506 28	1,779 66	865 80	697 62	5,894 70	26,303 56
	Total Expenditures	$100,852 32	$268,634 83	$3,864 58	$210,405 04	$75,677 20	$132,882 58	$71,731 29	$112,405 24	$79,402 52	$1,055,855 60

*Paid from appropriation for administrative office.

CLASSIFIED EXPENDITURES — CROWNHART HALL.

Year ending July 1, 1914.

1	**Capital Expenditures**		**1,211 80**
111	Land		
112	Land Improvements		154 10
12	Buildings and Fixtures		329 86
13	Machinery		100 00
14	Dishes and Kitchen Apparatus		106 20
15	Furniture and Furnishings		512 49
16	Hand Tools		9 15
7	**Maintenance**		**1,449 52**
71	Land and Land Improvements		36 90
72	Buildings and Fixtures		800 32
73	Machinery		140 97
74	Dishes and Kitchen Apparatus		189 86
75	Furniture and Furnishings		281 47
76	Hand Tools		
6	**Operation**		**13,965 19**
61	*Administration*		*881 28*
611	Salary of Matron		720 00
612	Clerks and Stenographers		
613	Stationery and Supplies		
614	Postage		1 07
615	Telephone and Telegraph		64 85
616	Express, Freight and Dray		32 49
617	Printing		18 37
618	Sundry Supplies and Exp		44 50
62	*Physical Plant*		*2,872 34*
6211	Salary of Engineer		
6212	Salary of Janitor		706 08
6221	Fuel		1,456 37
6222	Light and Fuel		539 17
6223	Water		145 03
623	Sundry Supplies		19 64
624	Sundry Expense		6 05
63	*Dining Room and Kitchen*		*8,912 47*
631	Salaries of Cooks and Servants		1,297 20
632	Subsistence:		
6321	Flour and Cereals	618 53	
6322	Meats, Fish and Eggs	2,254 40	
6323	Milk, Cream and Cheese	1,442 67	
6324	Butter, Lard and Fats	696 10	
6325	Sugar and Syrups	257 59	
6326	Dried Fruits	71 28	
6327	Fresh Fruits	760 09	
6328	Vegetables	833 18	
6329	Sundry groceries	427 02	7,360 86
633	Ice		94 00
634	Laundry		113 54
635	Sundry Supplies and Exp		46 87
64	*Housekeeping*		*981 90*
641	Salaries of Servants		484 75
642	Laundry		400 12
643	Sundry Supplies and Exp		97 03
65	**Insurance*		*277 20*
66	*Undistributed Expense*		*40 00*
	Total Expenditures		**16,626 51**

* Paid from appropriation for administrative office.

CLASSIFIED EXPENDITURES—ADMINISTRATIVE OFFICE.

Year ending July 1, 1914.

1	**Capital Expenditures**		**$465 89**
11	Furniture and Furnishings		410 87
12	Books and Documents		55 02
7	**Maintenance**		**9 50**
71	Furniture and Furnishings		9 50
72	Books and Documents		
6	**Operation**		**33,203 88**
61	*General Administration:*		
611	*Salaries of Officers*		*12,999 78*
6111	Regents	$2,141 65	
6112	Secretary	3,000 00	
6113	Business Agent	708 31	
6114	Accountant	1,437 50	
6115	Inspectors	3,375 00	
6116	Visiting Physician	2,337 32	
612	*Salaries of Office Employes*		*2,504 95*
613	*Traveling Expenses*		*7,357 54*
6131	Regents	3,200 57	
6132	Secretary	591 34	
6133	Inspectors	958 20	
6134	Business Agent	272 09	
6135	Accountant	219 56	
6136	Presidents and Teachers	1,983 84	
6137	Visiting Physician	131 94	
614	*Stationery and Office Supplies*		*257 95*
615	*Postage*		*509 42*
616	*Telephone and Telegraph*		*82 30*
617	*Express, Freight and Dray*		*139 19*
618	*Printing*		*2,719 21*
619	*Sundry Supplies and Expenses*		*54 33*
62	*Insurance*		*4,425 78*
63	*Undistributed Expense*		*64 75*
64	*Bd. of Pub. Affairs Survey*		*716 03*
65	*Style Sheet and Lessons*		*187 33*
66	*Alumni List*		*541 87*
67	*Inventory*		*643 45*
	Bills outstanding July 1, 1913—charged to accumulated balance		**1,971 58**
	Total		**$35,650 85**
	Less insurance distributed among Normal Schools		4,416 33
	Net Expenditures		**$31,234 52**

EXPENDITURES FOR INSTITUTES AND SPECIAL SUMMER SCHOOLS.

Year ending July 1, 1914.

		Year 1913-14.
611	Salaries of Conductors	$1,409 46
612	Traveling Expense	542 41
613	Printing	
614	Sundry Supplies and Expenses	7 60
	Total Institutes	$1,959 47
	Eau Claire Summer School	1,590 44
	Oconto Summer School	1,703 38
	Total	$5,253 29

SUMMARY OF EXPENDITURES.

Year ending July 1, 1914.

	Year 1913-14.
Eight Normal Schools	$1,055,855 60
Eau Claire Building and Grounds	24,976 00
Crownhart Hall	16,626 51
Administrative Office	31,234 52
Institutes and two Summer Schools	5,253 29
Total	$1,133,945 92

CONDITIONS OF LEGISLATIVE APPROPRIATIONS FOR LAND AND LAND IMPROVEMENTS—Sec (172—54) 22 W. S., 1913.

	Legislative appropriation.	Expended 1913-14.	Contracts outstanding. July 1, 1914.	Balance unexpended. July 1, 1914.	Appropriated by board.	Balance unappropriated.
La Crosse	$26,300			$26,300 00	$7,000 09	$19,300
Milwaukee	67,500	$67,500 00				
Oshkosh	31,000	4,063 00	$15,730 98	11,206 02	2,206 02	9,000
Platteville	12,000	5,500 00		6,500 00	1,500 00	5,000
River Falls	8,000	2,509 86	4,491 50	998 64	998 64	
Stevens Point	2,700			2,700 00	2,700 00	
Superior	20,000			20,000 00	4,000 00	16,000
Whitewater	4,600	2,025 00		2,575 00	1,575 00	1,000
Total	*$172,100	$81,597 86	$20,222 48	$70,279 66	$19,979 66	$50,300

*Available in two installments—$82,100 on March 1, 1914, and $90,000 on March 1, 1915

CONDITION OF LEGISLATIVE APPROPRIATION OF $150,000, AVAILABLE JULY 1, 1913, UNDER SEC. 406a—2, W. S., 1913, FOR BUILDINGS AND OTHER PERMANENT PROPERTY. (NOT INCLUDED IN BUDGET.)

	Appropriated by board.	Cash expenditures to July 1, 1914.	Balance available July 1, 1914.
Eau Claire	$2,000	$1,629 60	$370 40
La Crosse	35,000	988 33	34,011 67
Milwaukee	35,000	33,870 02	1,129 98
Oshkosh	30,000	27,869 11	2,130 89
Platteville	1,000	1,000 00	
River Falls	13,995	6,034 39	7,960 61
Stevens Point	6,105		6,105 00
Superior	11,900	5,041 40	6,858 60
Whitewater	15,000	6,140 58	8,859 42
Total	$150,000	$82,573 43	$67,426 57

CONDITION OF LEGISLATIVE APPROPRIATIONS MADE UNDER SEC. (172—54), W. S. 1913, AND SUMMARY OF ALLOTMENTS MADE THEREFROM BY THE BOARD INCLUDING ACCOUNTS PAYABLE AS LISTED AND ALLOWED.

	Legislative appropriations to July 1, 1914.	Expended 1913-1914.	Balance available.	Legislative appropriations due July 1, 1914.	Total available July 1, 1914.	Appropriated by board.	Balance unappropriated.
CAPITAL—Sec. 23-30.							
*Eau Claire	$75,000	$23,346 40	$51,653 60	.....	$51,653 60	$51,653 60	.....
La Crosse	13,750	11,301 41	2,448 59	$4,750	7,198 59	7,157 40	$41 19
Milwaukee	11,500	10,074 50	1,425 50	11,500	12,925 50	12,925 50	.....
Oshkosh	51,500	51,500 00	.....	10,000	10,000 00	9,889 73	110 27
Platteville	4,000	3,641 45	358 55	4,000	4,358 55	4,332 28	26 27
River Falls	131,000	57,603 91	73,396 09	6,000	79,396 09	79,104 32	291 77
Stevens Point	91,700	4,158 95	87,541 05	6,000	93,541 05	92,171 00	1,370 05
Superior	4,500	3,185 94	1,314 06	4,500	5,814 06	5,814 06	.....
Whitewater	4,000	1,200 74	2,799 26	4,000	6,799 26	4,283 34	2,515 92
Total	$386,950	$166,013 30	$220,936 70	$50,750	$271,686 70	$267,331 23	$4,355 47
MAINTENANCE—Sec. 14-21.							
La Crosse	$7,500	$474 15	$7,025 85	$7,500	$14,525 85	$11,502 60	$3,023 25
Milwaukee	7,500	5,168 77	2,331 23	7,500	9,831 23	4,410 17	5,421 06
Oshkosh	5,000	3,342 64	1,657 36	5,000	6,657 36	2,509 99	4,147 37
Platteville	3,750	2,509 20	1,240 80	3,750	4,980 80	1,692 27	3,298 53
River Falls	2,450	2,016 30	433 70	4,450	4,883 70	4,883 70	.....
Stevens Point	3,000	2,840 21	159 79	3,000	3,159 79	3,160 11	32
Superior	4,500	2,689 76	1,810 24	4,500	6,310 24	6,310 24	.....
Whitewater	4,000	1,437 23	2,562 77	4,000	6,562 77	2,101 20	4,461 57
Total	$37,700	$20,478 26	$17,221 74	$39,700	$56,921 74	$36,570 28	$20,351 46
OPERATION—Sec. 4-13, 33.							
La Crosse	$79,347	$76,958 04	$2,388 96	$79,347	$81,735 96	$78,459 50	$3,276 46
Milwaukee	133,122	120,830 39	12,291 61	133,122	145,413 61	137,831 35	7,582 26
†Milwaukee—Deaf School	5,000	3,667 14	1,332 86	5,000	6,332 86	5,031 94	1,300 92
Oshkosh	104,037	102,778 28	1,258 72	104,037	105,295 72	104,852 99	442 73
Platteville	66,400	58,944 07	7,455 93	66,400	73,855 93	65,271 14	8,584 79
River Falls	65,546	57,733 22	7,812 78	65,546	73,358 78	73,022 99	335 79
Stevens Point	67,305	62,725 69	4,579 31	67,305	71,884 31	70,000 64	1,883 67
Superior	74,850	68,092 92	6,757 08	74,850	81,607 08	77,033 12	4,573 96
Whitewater	65,131	62,022 94	3,108 06	65,131	68,239 06	67,571 93	667 13
Crownhart Hall	‡17,952 32	16,349 31	1,603 01	.....	1,603 01	1,603 01	.....
Board	42,340	31,236 82	11,103 18	42,340	53,443 18	43,443 18	10,000 00
Institutes	9,500	5,025 80	4,474 20	9,500	13,974 20	11,321 00	2,653 20
Total	$730,530 32	$666,364 62	$64,165 70	$712,578	$776,743 70	$735,442 79	$41,300 91

* Chap. 359, Laws of 1913—from General fund. † Chap. 48, Laws of 1913—from General fund. ‡ Receipts into Revolving Fund, Chap. 758, Sec. 33, Laws of 1913.

BALANCE
of Wisconsin State Normal

Acc't No.	ASSETS	La Crosse.	Milwaukee.	Deaf School Milwaukee.
	1. Capital Assets.	**318,964 38**	**672,499 73**	**1,213 92**
111	Land	44,400 00	192,299 09	.....
112	Land Improvements	11,450 26	11,380 75	.....
12	Buildings and Fixtures	213,235 37	391,179 78	.....
13	Machinery	5,990 00	6,585 25	.....
14	Educational Apparatus	13,356 99	14,764 48	207 81
15	Furniture and Furnishings	15,792 75	23,267 07	502 10
16	Hand Tools	106 71	209 60	.....
17	Library	9,388 73	21,716 49	189 47
18	Museum	1,993 50	825 82	.....
19	Text Books	3,250 07	10,271 40	314 54
	2. Floating Assets.	**1,264 22**	**483 77**	.....
24	Materials and Supplies:			
241	Administration	154 52	7 00	.....
242	Physical Plant:			
2421	Power Plant	29 59	.....	.....
2422	Fuel	112 50	.....	.....
2423	Janitor's Materials	89 00	.....	.....
243	Educational Supplies	878 61	476 77	.....
244	Library Supplies	.....	.....	.....
	Total Assets	320,228 60	672,983 50	1,213 92
	LIABILITIES AND CAPITAL.			
	3. Liabilities.	**8,263 62**	**27,907 34**	**197 29**
31	Accounts Payable	1,143 20	1,970 77	197 29
32	Land Contracts Payable	7,129 42	25,936 57	.....
	4. State of Wisconsin—Surplus.	**311,964 98**	**645,076 16**	**1,016 63**
41	Surplus Invested in Capital Assets	311,814 01	645,434 39	1,016 63
42	Surplus Invested in Materials and Supplies	150 97	*358 23*	.....
	Total Liabilities and Capital	320,228 60	672,983 50	1,213 92

* Includes construction in progress, $76,800 00.

SHEET

Schools, as of July 1, 1914.

Oshkosh.	Platteville.	River Falls.	Stevens Point.	Superior.	Whitewater.	Total.
417,080 47	**176,863 86**	**197,987 43**	**177,844 35**	**103,652 44**	**211,897 48**	**2,278,004 06**
67,500 00	9,450 00	16,250 00	13,200 00	70,400 00	22,000 00	435,549 09
.....	2,256 60	4,448 90	5,100 00	7,000 00	15,700 00	57,346 51
252,860 46	121,945 43	148,764 80*	106,054 84	24,039 05†	130,571 62	1,388,651 35
10,510 00	2,756 00	1,654 35	11,204 05	.....	1,975 00	40,674 85
27,855 74	9,274 95	8,304 00	11,669 02	103 00	10,710 68	96,246 76
23,824 37	15,212 48	7,553 71	11,982 96	267 96	13,622 36	112,025 76
354 60	124 95	265 20	123 09	5 55	151 05	1,340 75
22,500 00	11,489 85	7,641 57	12,911 59	335 27	11,462 77	97,735 74
1,625 30	703 00	.....	500 00	.....	990 00	6,637 62
10,000 00	3,650 60	3,004 61	5,098 80	1,501 61	4,714 00	41,805 63
1,450 42	**833 75**	**958 68**	**1,191 48**	**55 05**	**372 14**	**6,611 51**
56 40	103 00	305 75	126 55	47 55	.....	799 77
47 32	22 10	9 10	44 56	.....	.....	152 67
114 25	93 60	202 50	.....	.....	.....	522 85
456 15	134 40	71 60	30 00	.....	.....	781 15
726 30	431 10	369 73	990 37	7 50	354 31	4,234 72
50 00	52 55	.....	.....	.....	17 80	120 35
418,530 89	177,699 61	198,946 11	179,035 83	103,707 49	212,269 62	2,284,615 57
17,160 27	**1,831 21**	**4,908 23**	**663 65**	**273 75**	**146 62**	**61,351 98**
1,429 29	1,831 21	416 73	663 65	273 75	146 62	8,063 51
15,730 98	.....	4,491 50	.....	.....	.....	53,288 47
401,370 62	**175,868 40**	**194,037 88**	**178,372 18**	**103,433 74**	**212,123 00**	**2,223,263 59**
401,018 42	175,873 30	193,490 23	177,844 35	103,645 24	211,867 73	2,222,002 30
354 20	*4 90*	547 65	527 83	*211 50*	255 27	1,261 29
418,530 89	177,699 61	198,946 11	179,035 83	103,707 49	212,262 62	2,284,615 57

†Construction in progress.

BALANCE SHEET.

Crownhart Hall, as of July 1, 1914.

Account No.	ASSETS.		
	1. Fixed Assets		**$56,341 38**
12	Buildings and Fixtures		48,091 45
13	Machinery		809 75
14	Dishes, Cutlery, etc		727 18
15	Furniture and Furnishings		6,678 75
16	Hand Tools		9 25
17	Library		25 00
	2. Floating Assets		**295 78**
24	Materials and Supplies:		
242	Physical Plant:		
2423	Fuel		65 00
243	Housekeeping:		
2431	Subsistence		189 33
2432	Laundry		25 70
2433	General		15 75
	Total Assets		$56,637 16
	LIABILITIES AND CAPITAL.		
	3. Liabilities.		
31	Accounts payable		**56,637 16**
	4. State of Wisconsin Surplus		56,341 38
41	Surplus Invested in Capital Assets		295 78
42	Surplus Invested in Materials and Supplies		
	Total Liabilities		56,637 16

CONSOLIDATED BALANCE SHEET.

As of July 1, 1914.

Account No.	ASSETS.	8 Normal Schools.	Crownhart Hall.	Eau Claire.	Total.
1	Fixed Assets	$2,278,004 06	$56,341 38	[1]$24,976 00	$2,359,321 44
2	Floating Assets	6,611 51	295 78		6,907 29
	Total Assets	$2,284,615 57	$56,637 16	$24,976 00	$2,366,228 73
	LIABILITIES AND CAPITAL.				
3	Liabilities	61,351 98			61,351 98
4	State of Wisconsin Surplus	2,223,263 59	56,637 16	24,976 00	2,304,876 75
	Total liabilities	$2,284,615 57	$56,637 16	24,976 00	$2,366,228 73

[1] Consists of Land Improvements $1,629.60 and Construction in Progress $23,346.40

Respectfully submitted,

THEODORE KRONSHAGE, JR.,
President.

BIENNIAL REPORT OF THE TREASURER OF THE BOARD.

NORMAL FUND INCOME.

Receipts.	1913.	1914.
Description:		
From state tax		$499,700 17
From interest on land certificates	$61 14	28 70
From interest on loans	40,836 25	38,667 33
From interest on bonds	9,001 82	9,545 21
From interest on state deposits	1,195 59	2,461 82
From interest on certificates of indebtedness	36,099 00	36,099 00
From office fees	405 00	771 00
From state insurance		94,914 80
From normal schools	89,341 77	96,181 84
Total	$176,940 57	$778,369 87
Transfers:		
General fund appropriations	$215,951 47	$327,890 00
Tax remission	440,235 00	223,605 00
Refunds	524 45	81 63
Total receipts, transfers and refunds	$833,651 49	$1,329,946 50
Disbursements.		
For state insurance	$8,482 30	$4,416 33
For normal school and institutes	918,120 20	1,057,153 51
For excess interest refund		1 64
Total	$926,602 50	$1,061,571 48
Recapitulation.		
July 1, 1912, balance	$96,703 23	
Receipts for two years	2,163,597 99	
Disbursements for two years		$1,988 173 98
Balance July 1, 1914		272,127 24
Total	$2,260,301 22	$2,260,301 22

NORMAL FUND.

Receipts.	1913.	1914.
Description:		
Payment on land certificates	$114 00	$45 00
Payment on loans	177,929 88	127,899 86
Payment on bonds	38,250 00	30,450 00
Total	$216,293 88	$158,324 86
Disbursements.		
Investments		
Loans	$68,000 00	$141,400 00
Bonds purchased	98,500 00	
Total	$166,500 00	$141,400 00
Recapitulation.		
Balance on hand July 1, 1912	$6,950 83	
Receipts for two years	374,618 74	
Disbursements for two years		$307,900 00
Balance on hand July 1, 1914		73,669 57
Total	$381,569 57	$381,569 57

HENRY JOHNSON,
State Treasurer.

REPORTS OF PRESIDENTS OF NORMAL SCHOOLS

OSHKOSH.

HON. THEODORE KRONSHAGE,
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, 1914.

BUILDINGS AND GROUNDS.

The Industrial Education Building, just starting when I reported two years ago, has been completed and furnished. The Regents have bought more land for the Normal School. We still need about $36,000 with which to buy the remaining property on the block on which the Normal School is located. When all is purchased, we will have a holding of about seventeen acres. This certainly will be modest enough for the school in the years that lie ahead.

The Legislature of 1913 made available March 1, 1915, $100,000 for the rebuilding of a part of the main building. We are in a peculiar situation at Oshkosh in that we must rebuild the building while we are yet occupying it. The present building is full to overflowing so that the first step in the plan of rebuilding will probably be to throw a long, narrow building directly in front of the present building and with the room made thus possible tear out a part of the present building and put in a more modern structure. This will have to be done in two stages. An Auditorium building will be needed which will also provide additional class rooms. Estimated cost for building and furnishing—$150,000. The next step would be a Library to cost $100,000. This would give a fair sized building suitable to accommodate six hundred students of normal grade and also allow us to keep our present gymnasium and our present east wing so-called, erected in 1900, as a training school. Ultimately, of course, these two buildings will have to be replaced and the plans provided by the architects include their ultimate rebuilding as a part of the original unit. Our immediate needs are, therefore, $36,000 for land purchases; $150,000 for an Auditorium building, and $100,000 for a library building. Anyone who has seen the building at Oshkosh knows that we are in immediate need of these improvements.

COURSES AND ATTENDANCE.

We have had for a number of years a course for the training of young boys and girls from the country, who have finished the work of the country school, to go back into the country school. This has brought us an immature group of young people. This group does not increase in size particularly, and we have fewer students in the course than we had four years ago. The reason for this is that the county superintendents in this territory are not satisfied to recommend for

their country school positions persons with the immaturity and lack of insight into human affairs which these boys and girls have after only two years of work at the Normal School beyond their attendance at the country school. It would seem to me, therefore, wise to eliminate this course at Oshkosh,—in part for the reason already given, and in part for the reason which follows.

The attendance in the college course has increased materially. It has not been as rapid as many had hoped it would be, but sufficiently rapid for all practical purposes in connection with the development of the course. The attendance of high school graduates shows a marked increase and we have recovered from all of the losses incident to the change from the former basis of admission of students to the high school graduate basis. The existing industrial course brings to us a considerable and growing number of young men each year, and there seems to be constantly a greater call for the services of these young men than we can possibly meet. In the two years just closed, the Normal School at Oshkosh has issued 334 diplomas, 38 rural school certificates, and 5 college course certificates,—a total of 377 diplomas and certificates. When the number of diplomas (334) is compared with the number issued for the biennium ending in 1911; viz., 240, it is clear that there has been an increase of 94 diplomas in four years. This is an increase of almost 40% in four years. The prediction made in my last biennial report that the newly organized industrial training course and college course would attract students to such an extent as to fill our building has been realized.

SUMMER SCHOOL.

The summer school attendance has been very gratifying, indeed, and especially the numbers who have come to us for the advanced work of the first grade certificate. While the six weeks' requirement plan has been open to many objections, it certainly has brought about a higher grade of scholarship among the country school teachers than ever existed in Wisconsin before. With the new statutes governing certification of teachers, there will be no summer school of the type that we have had previously, but there will be people who want to do their regular school work and people who want to do the work for first and second grade certificates, so that there will be scarcely any perceptible decrease in the size of the summer schools. They will become regular parts of the school year under the new plan and I believe that they will prosper accordingly.

FACULTY.

We have been able to retain the most of our faculty at Oshkosh for the last biennium. We have an exceptionally large number of teachers who live for the school. The increases in salaries which have been granted are well deserved. The present departmental organization will demand better salaries for the people who serve as heads of these departments, but these will be relatively small, unless the cost of living should soon overtake and pass the salary increases which we have been able to give to our teachers.

TRAINING SCHOOL.

For years we have said to the Board of Regents that our training school is too small for the number of students who were required to do practice teaching in it. At no time should a training school of the size of the one at Oshkosh have more than one hundred practice teachers assigned to it. We have been having to assign about one hundred fifty constantly for the past two years. We must either offer certain attractions to the children of Oshkosh to come to our training school in the way of better building, equipment, and teaching than they can

get in the public schools, together with a decreased tuition, or else we must make connection with the public schools for our practice teaching. There are two diametrically opposite views of practice teaching. One is that a student teacher should be put in charge of a room situation and allowed to sink or swim, with only occasional visitation from supervisors or inspectors and without any real help. The other view of practice teaching is that it should begin with a small group of children after a study of the teaching process and that the beginning teacher should be helped both in organization of subject matter into suitable units for teaching and also in the art of imparting knowledge itself. This demands close supervision, helpful criticism, and frequent contact. This work, to be sure, should broaden out into room charge, but always under conditions that safe guard the welfare and interests of the children. The plan which we have finally worked out for a tentative trial at Oshkosh is a plan by which superior teachers are sent into the regular graded rooms of the city and have assigned to them a limited number of normal school students for practice work each semester,—the students being assigned for a half day each.

The Normal School pays part of the salary of these room teachers. My own conviction is that it is far better to spend money in this way than to spend an equal or larger amount in occasional inspection.

SUMMARY.

The two years just closed have been years of change and readjustment. The school is going on to what is for it a new basis. It has outgrown its old work and its old form of organization. It is making for itself a new one which we trust will result in greater serviceableness to the state of Wisconsin.

Respectfully submitted,

JOHN A. H. KEITH,
President.

LA CROSSE.

La Crosse, Wisconsin,
September 12, 1914.

HONORABLE THEODORE KRONSHAGE,
President of Board of Regents of Normal Schools.

DEAR SIR:—I submit herewith a brief report for the State Normal School at La Crosse, Wis. for the two years ending August 24, 1914:

PHYSICAL PLANT.

The building and grounds are in good condition. The addition to the campus authorized in 1911 has been made, six acres having been purchased immediately west of the original site. On the block just north of the original building, the School of Physical Education, authorized by the Board of Regents in 1913, is to be located. For the use of the School of Physical Education, the city has leased to the board a portion of the Fair Grounds east of the building to be used as an athletic field, and this is just now being put in condition. In addition, several new tennis courts have been added to the original clay courts.

The building itself is now being re-decorated. The class rooms are to be tinted an appropriate color and glazed, and the additional woodwork installed in the library. The auditorium and library are handsomely decorated in colors; new shelving has been installed to meet the needs of the growing book collections and certain changes made in the lighting.

STUDENTS.

The enrollment shows a steady growth since 1912 as follows:

Year	Men	Women	Total
1911–1912	104	294	398
1912–1913	113	298	411
1913–1914	154	299	453

For the year beginning Sept. 15th our enrollment was about 60 more than one year ago due quite largely to the newly organized school of Physical Education.

Analysis of the above figures shows that the increase is due mainly to a growth in the number of young men. This is an exceptionally encouraging condition, and one which will continue to be true, as the college courses and the work in physical education continue to attract young men. I speak of it as encouraging, because there is no reason why normal schools should be so completely feminized as the schools in some states are in danger of becoming; and though our young men may not be enrolled in the professional courses at first, their presence encourages the enrollment of men who wish to teach, and in several instances young men entering the college courses have transferred to the normal school at the beginning of the second year.

DEAN OF WOMEN NEEDED.

The great needs of our student body at present are two *Dormitory facilities* and a *Dean of Women.* Our rooming problem is, in many ways, acute. A Dean of Women to look after the needs of the girls is very much needed. In a school in which the majority of students are, and probably always will be young women, the office of Dean of Women is almost a necessity. In a school, such as ours, with no dormitory, the office of Dean of Women is absolutely necessary. We have come to a point where without such a person we cannot fulfill our duty to the young women entrusted to our care.

FACULTY.

The faculty has increased with the students and with the specialization required by the installation of new departments, from twenty-nine in 1912, to thirty-seven for the current year.

Pursuant to the recent action of the Board, the Normal School Courses have been re-classified as follows: Courses for Primary and Grammar Grade teachers. A course for the Principals of State Graded Schools and a course for the preparation of High School teachers and Principals. What effect this will have on the future teaching force graduating from this school remains to be seen. We have had a good many students,—young men, preparing for high school work in the past two years and it is likely that the new High School Course will be popular. Indeed, the enrollment last week indicates this.

The College Course has grown steadily since its introduction September, 1911. The enrollment has grown from 41 in 1912, to 60 last year, and 65 at the opening this fall. There is a growing interest in this work in and about La Crosse, which will result in a large College department in this school in the near future.

The College Courses have a good influence on the regular Normal School students, emphasizing the need of more scholarship than is offered in the ordinary two years courses for the training of Primary and Grammar grade teachers.

The current year shows an increase in the numbers enrolled in the School of Physical Education. This course was in its infancy last year when we enrolled 22 students. Our new physical education building, when completed, will have a tendency to attract to this course large

numbers of young men and women not only from La Crosse and vicinity but from all parts of Wisconsin as well as from other States.

The committee of the State Board of Public Affairs inspected our work last year. On the whole, I think this inspection has very materially improved our work all along the line.

Respectfully submitted,

F. A. COTTON,
President.

PLATTEVILLE.

HONORABLE THEODORE KRONSHAGE,
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 Platteville, for the two years ending August 31, 1914.

BUILDINGS AND GROUNDS.

During the past two years, minor improvements have been made in the Normal building. One of the most important of these was the installation of new steel lockers. Three hundred were purchased last year from the Hess Warming and Ventilating Company. The lower corridor has been refurnished with new electric light fixtures, thus adding to the beauty and cheerfulness of this part of the building. The Auditorium, also, has been equipped with an indirect lighting system. Among other improvements, a new chemical laboratory has been fully equipped with up-to-date laboratory tables and hoods. Minor improvements have been made in other instances. The superintendent of the building is most efficient in making small repairs, and is painstaking in keeping the building in a most cleanly and sanitary condition.

Excellent school gardens have been maintained during the past two years. The work of the agricultural class during the past summer has been most successful. The plat of ground which, up to date, has been small, will be increased through the leasing of fifteen acres of land for the coming year, making the facilities for agricultural study and school gardening more advantageous.

Recently, two resident properties just back of the Normal, facing Pine Street, were purchased and the buildings removed. It is hoped that in the near future a third property, adjacent to those recently purchased, may also be secured. This will enlarge the school campus, enable much needed walks to be built and supply the ground for an addition to the building. As this report is written, the boys in the agricultural class are building a blacksmith shop and forge room, 30 x 60, just south of the Normal, on the lot recently purchased from R. P. Holmes. All of the concrete work, as well as the carpenter work, on this building, is being done by the students in the farm carpentry class.

While the building is not taxed to its full capacity, yet it is true that every room in the building is in use. It is thought that the boys' society hall will have to be utilized this year for the students in the new Rural School Course. What is most needed is a new and larger gymnasium. Our two physical directors cannot do their best work so long as they are confined to one rather small gymnasium. With the addition of a new wing to the main building, there is hope that an additional gymnasium will be supplied.

COURSES OF STUDY.

At the February, 1914, meeting, the Board of Regents established a department of agriculture and a rural school department, at the Platteville school. A special agricultural bulletin was published in April out

lining the courses of study. The course in agriculture, as well as the rural school course, is, in a sense, tentative. Further study and investigation will have to be made before the courses can become reasonably definite. The recent annual catalog of the Platteville Normal will show that the school has entered into the spirit of specialization as recommended by the Board of Normal Regents. Effort was made to require in each course, a study of such subjects as seem especially helpful to teachers in the respective grades.

ATTENDANCE.

School has opened for the year with an attendance of 290. There should be 350 students in the Normal school as it is now equipped and manned. It is sincerely hoped that the addition of new courses will soon increase the attendance to this figure. Five years ago, when the writer assumed charge of the school, the yearly enrollment, as the catalog for the succeeding year will show, was 287. When it is recalled that our neighbor normal school at La Crosse has grown up and established a large attendance during the past five years, and when it is recalled that Platteville Normal must draw its attendance almost wholly from a quadrant extending to the north and east, it may not seem as if the school has done poorly, even from the point of view of attendance. Nevertheless, it is hoped and confidently expected, that the attendance will increase next year to 350 students. It may be of interest to state that there are 24 young people who have registered for the high school course, and *especially* interesting to know that of this number, there are six young men and one young woman who already hold the diploma of this school. Twenty-four young men have enrolled this year in our new course in agriculture. It would seem that another year this number might almost be doubled. The rural school course did not meet with the response that was hoped. It is thought, however, that when it is better understood that such department has been established at Platteville, that the number attending this department will become much larger. The Board will recall that the new courses established in the Platteville Normal are the newest and most recently established in any of the normal schools of the state. They have, therefore, not had a chance, as yet, to attract students as special departments in other normals have done.

EFFICIENCY.

Ultimately, there is but one standard for the efficiency of a normal school. The success of such a school cannot be measured according to any pre-established standard that might be set up. "Of what worth to a community are its graduates" is the true and safe standard of efficiency. According to this criteria, we feel that our school has succeeded. Good teaching has been done. Last June, for example, thirteen young men, members of the senior class, took the State Superintendent's examination for licenses to teach agriculture. The examination was searching. Eleven of the thirteen young men received their licenses. When it is remembered that the special course in agriculture had not yet been inaugurated, and that these young men had not had the opportunities that are now being offered in agriculture, the good standing that they made will surely reflect credit upon the instruction. In other departments it is believed that progress has been made in the matter of improving the classroom work in school.

SPIRIT OF THE SCHOOL.

The spirit of the school is delightful. Almost without exception, the members of the faculty pull together in genuine team work. The sympathy and co-operation between the Normal School and the Training School has been maintained during the past two years. At the present time, a number of the heads of departments are daily supervising and

observing the work in the Training School. Conferences between these department heads and the critic teachers are frequent. It has often been pointed out in big conventions that one of the chief faults in normal schools, is the isolation of the normal and training departments. Certainly, that charge cannot be laid at the door of the Platteville Normal. Surely, at the present time, there is one school—not two departments.

The spirit of the student body is highly to be commended. The students are responsible and largely control themselves. One of the inspectors recently vountarily and publicly paid the student body a high compliment for their courtesy and conduct.

AUXILIARY ORGANIZATIONS.

During the past biennium, the auxiliary organizations have been better looked after than heretofore. The school paper has been splendidly edited. Not a single delinquency occurred in the subscription list for the past year. The paper appeared *on time* every month. Not a single outstanding bill remained at the close of the year, and there was a small balance in the treasury. It is thought that the students gained a great deal by managing the paper and managing it well. Our inter-normal debates have been especially good the past two years, during which time we have each year won two out of the three contests in debate. Our orator last year stood second in the list, while the per cents of the judges gave him first place. Our athletics have been good. Two years ago, our baseball team won eleven straight victories. We have had especially strong basketball teams. Our athletic relations with our sister normals have been pleasant. We have had no jangles. We appreciate and approve the assistance the Board has given to this phase of education, and we are striving to do our part and do it well.

In conclusion, I wish to express my hearty thanks to the Board of Normal Regents for their constant and most generous support during the past two years.

Respectfully submitted,

W. J. SUTHERLAND,
President.

October 13, 1914.

STEVENS POINT.

HONORABLE T. H. KRONSHAGE,
President of the Board of Normal School Regents.

DEAR SIR:—I have the honor to submit to you the following report of the Stevens Point Normal for the biennial period ending August 31, 1914.

This biennial period has been one of marked progress, the faculty and students uniting in a joint effort to realize in fullest measure the true mission of the normal school—that of preparing teachers for the schools of the state and of inspiring them with a professional zeal, which operates as a force for self-improvement for many years after students have entered upon their professional careers.

ATTENDANCE.

The attendance in the Normal Department for 1912–1913 was 353 and in the Training School 205. During the year 1913–1914 the enrollment in the Normal Department was increased to 406, and in the Training Department to 236, making it the largest in the history of the school.

NEW DEPARTMENTAL ORGANIZATION.

Pursuant to action of the Board in February, 1914, declaring it to be its policy to organize the classes of each normal school on the basis of

special departments and directing the presidents to modify the academic and professional work of the classes so far as may be necessary in order to train efficient primary, grammar grade, and high school teachers, as well as teachers of special subjects, the Stevens Point Normal now sustains the following departments under general direction of members of its faculty:

Training School, F. S. Hyer; Domestic Science, Miss Bessie M. Allen; Rural School, John Phelan; First Three Years of Five Year Course, A. J. Herrick; Primary, Miss Helen Parkhurst; Grammar, M. M. Ames; High School, H. S. Hippensteel.

This policy formally adopted by the Board has practically been in operation in this school for several years, and it has demonstrated the wisdom of such action on the part of the Board in the preparation of efficient teachers in the several fields of public school education.

FACULTY.

During the biennium the following additional teachers have been authorized by the Board:

Teacher of Biology and allied subjects in the Domestic Science Department; Assistant in the Science Department; Assistant Critic in the Primary Department; Assistant in the Rural School Department; Teacher in the Rural Observation School; Athletic Director for men, and Medical Examiner.

The faculty is made up of men and women of character, scholarship, teaching ability, strong personality, and honorable ambition. Miss Helen Parkhurst, head of the Primary Department, was granted leave of absence in February, 1914, in order that she might spend a half year at Rome, Italy, studying the Montessori System under the direction of its famous founder. Prof. C. A. Bowman, of the Manual Training Department, was granted leave of absence for the school year 1913–1914 in order to make further study of his special line of work at Columbia. Many others attended summer sessions at higher institutions.

PRACTICE TEACHING.

Teachers cannot be manufactured, they must be developed by giving them a basis of scholarship and a mastery of principles. If our students can be given the mastery of educational principles and opportunity for drill in the application of these principles while in the normal school, they will be prepared to follow the varying suggestions given them by principles or superintendents and adapt themselves to the situations. Strenuous effort is made by the normal school to break from the tendency of normal graduates to do things in just the way the normal school did them, forgetting that outside conditions may be wholly different.

Efforts are constantly being made to bring conditions in the Training School more nearly in harmony with actual public school conditions, by enlarging the number of pupils in the practice classes, by affording opportunity for continuous practice for half day sessions, and by making adjustments with city schools. Such practice teaching, when taken under thorough supervision, gives confidence and effectiveness.

SUMMER SESSION.

It is gratifying to know that persons wishing to qualify for rural school teaching and to take advanced work for other lines of school teach, have taken advantage in generous numbers of the opportunities offered at Stevens Point, 381 having enrolled in 1913 and and 485 in 1914. This initial movement in legislation to provide professional teachers for all the schools, has worked satisfactory results, and the legislature of 1913 is to be complimented on its wisdom in ex-

tending the period of preliminary preparation to one year. The Normal schools have assumed the role of leadership in this direction, as the organic law establishing them held it to be their prime function to provide teachers for all of the schools of the commonwealth.

RURAL SCHOOL COURSE.

The Rural School Department, opened September 1912, has made definite, steady and purposeful progress. During the first year 45 students enrolled, which number was increased to 72 the second year. One of the essentials of training teachers for work in rural schools—the opportunity to observe the work of a trained teacher in a rural school—is brought about through affiliation with District No. 8 in the Town of Stockton, located eight miles from the Normal, and easily accessible by rail.

The progressive spirt revealed by the people of this district in making necessary improvements has rarely been equalled. The building was raised, and now has fine basement rooms for teaching Manual Training and Domestic Science and for social purposes. A new heating plant was installed; a well was dug in the basement for greater convenience in the Domestic Science work; the building was enlarged, and other improvements made, until it is now probably the best equipped rural school in the state.

The students enrolled in the Rural School Department spend two weeks in this district, observing the work under expert guidance, gathering suggestions for their own work later, their energies being directed by skilled teachers, in the management, control, and teaching of a country school. In addition to this work in observation each student teaches for a period of thirty weeks in the regular Training School of the Normal.

DOMESTIC SCIENCE AND DOMESTIC ART.

The Stevens Point school is the only Normal in Wisconsin which prepares teachers of Domestic Science and Domestic Art for the public schools. The attendance in this special course has steadily increased, the current enrollment being about 100 students, whose work is directed by four special teachers in addition to the instruction given by members of the faculty in other departments closely affiliated. This course offers training for girls in those subjects which affect home life, and give in addition the ability to teach these subjects effectively. As the public schools of the commonwealth, under the stimuli of legislation and public demand have introduced courses in Home Making, so the Normal must train teachers fitted to give such instruction.

Practice teachers in Domestic Science and Domestic Art are taught under the supervision of the director. Opportunity for such practice is offered in the grades of the Training School and, through the courtesy of the City Board of Education, also in the fifth, sixth, seventh, and eighth grades of the public schools of Stevens Point. Arrangements for such practice teaching have recently been made with parochial schools in the city. No other school in the Middle West training Domestic Science and Domestic Art teachers offer such splendid opportunities for practice teaching.

ADDITION, COTTAGES AND DORMITORY.

The new wing on the east side of the main building the construction of which has now been begun, will, with the exception of the auditorium, be used exclusively by the Domestic Science and Domestic Art Department. It will contain modern laboratories; sewing rooms; kitchens; pantries; dining, reception, exhibit, and lecture rooms, and offices. The president of the school and the head of the Domestic Science Department were instructed to make a trip east, visiting all of

the leading Domestic Science Training Institutions in the country. Their contact with such institutions enables the Board to have this the most perfectly and efficiently equipped department of its kind in the Middle West.

Contract for the cottages, to be used in connection with the department, was awarded recently. They with the addition will be completed about March 1, 1915. Each cottage will contain a living room, bedrooms, dining room, kitchen, and cellar, all heated and adequately furnished in good taste, in which the young women of the senior class will live in turn in groups of four for short periods of from three to five weeks, each putting practice, under the supervision and direction of the head of the department, many of the principles they have learned in Domestic Science and Domestic Art, taking charge of the house, running it themselves, and being held responsible for results. A garden class will be provided for those who take the course in School and Landscape Gardening. This course will include study of dooryards, how to utilize and beautify them; the care and use of tools used in the culture of flowers and vegetables; the trimming and shaping of flower beds, as well as the care of flowers and shubbery, and the gathering, saving and selecting of seeds.

At the February, 1914, meeting the Board of Regents decided that the one hundred thousand dollars voted by the legislature for a dormitory, should be given to Stevens Point. It is planned to start this building within a year. The dormitory will furnish a comfortable sanitary, and desirable home for many of the young ladies of the school. At the same time it will give an opportunity for the students of the Domestic Science Department to obtain valuable practice in cookery and serving for large numbers in institutional management and laundry work.

EXTENSION.

The Farmers and Home Makers Conference movement, inaugurated in 1912, has made notable progress. At the last meeting, held March, 1914, over four hundred were in attendance, taking part in a program which had to do with rural conditions and uplift.

It is my conviction that this Normal School, through this movement and its course for the preparation of rural school teachers, is playing its part admirably in the betterment of rural conditions in this county. Each Normal School preparing such teachers should own an experimental farm, in order that real farming might be carried on—that the prospective students may have first-hand contact with the problem of conserving the health, intelligence, and industrial well being of the farm population.

THE FUTURE.

The Stevens Point Normal, with the largest enrollment in its history; its fine buildings; splendidly equipped laboratories, and well selected library; its competent faculty; its enthusiastic student body; its loyal alumni, together with the growing generous support of its patrons in Central Wisconsin, faces the future with confidence and with the hope that it will march abreast of every forward movement in responding to the educational needs of the people, through the creation of ideals, the education of standards, and the exemplification of the best teaching both in academic and the practice departments.

Thanking the members of the Board for the many courtesies extended, this report is respectfully submitted.

JOHN F. SIMS,
President.

August 31, 1914.

SUPERIOR.

Superior, Wis., Sept. 29, 1914.

HONORABLE THEODORE KRONSHAGE,
President Board of Regents of Normal Schools.

DEAR SIR:—I have the honor of submitting the following biennial report of the Superior State Normal school for the years 1912–13, and 1913–1914.

The work of the past two years has been characterized by an optimistic attitude and a general spirit of progressive activity. The entire school has manifested a gratifying appreciation of the true function of a normal school, this appreciation being shown in a growing tendency more intelligently to study the live problems of modern education and to modify our courses and methods to meet the demands of the social and industrial needs of the state. Members of the faculty, in order more fully to equip themselves for this service, have been active in availing themselves of opportunities for growth by attending summer schools, special professional institutes, educational associations, and by frequent visitation of the public schools. The general spirit of cooperation and helpfulness among faculty and students alike has been highly stimulating. A study of the catalogues for the past three years will show an increased attendance in all departments and a larger sphere of activity for the Superior Normal School in the State of Wisconsin. The following summaries indicate the numerical growth:

	Total enrollment	H. S. graduates	Men	College course
1911–12	434	198	51	
1912–13	472	218	66	22
1913–14	513	251	92	30

The enrollment at the beginning of the present year shows a slight decrease over the enrollment for the corresponding period last year. However, considering the destruction of our building and the fact that we are occupying several different buildings in the city, the authorities are surprised and gratified at an enrollment of over 390 during the second week. A study of this enrollment shows over ninety postoffices outside of Superior represented by students now in attendance.

The event of most dramatic interest in our history for the past two years was the destruction of the Normal School building by fire in March of last year. The loss was total, including all the books and records of the school. Through the thoughtfulness and generosity of the school authorities of Superior in tendering us the use of their buildings, we were able to continue our work without missing a single recitation. At present the Normal department is quartered in the new high school building, holding sessions from 1:50 P. M. until 6:00 P. M., the Training Department occupying rooms in one of the ward buildings, while the Kindergarten Training Department is located in the recreation room of Crownhart Hall. Two or three classes have been held in the auditorium of the public library. Our new reference library is being installed in a new store building near the high school. Although we are scattered over the city, we are still a unit and are rolling up our sleeves for a bigger and better Superior Normal School. The magnificent spirit of loyalty exhibited by the students and faculty at the time of our calamity and continued under conditions which are still somewhat difficult, more than compensates for any mere physical loss. I cannot close this paragraph without expressing our appreciation of the splendid spirit of fellowship shown on the part of the city teachers of Superior in numerous courtesies, often accompanied by personal discomfort and sacrifice on their part.

On account of the fact that the insurance on the old building was wholly inadequate to rebuild a completed structure that would take care of all the departments, work was started on only one unit, a building planned to house the recitation rooms, a temporary library, and the general offices. With the money available it was impossible to make any provision for the training department, the library, the commercial department and the gymnasium. The new building now in course of construction is fire proof throughout and when completed according to the full plans will give us a splendid new home.

The above description of our loss hints at our immediate needs in the way of buildings:

I. The completion of the two wings of the main building, which, on account of lack of funds, we were absolutely unable to undertake at this time. According to the plans of the completed structure, one of these wings will house the new library, together with some additional rooms for science, commercial branches, and manual training, while the other is to be given over to the training department. At the present time the training department is crowded into one of the ward buildings of the city, occupying rooms made by erecting temporary partitions in an old assembly room. Even when the present unit of the new building is completed, there will be no accommodations for this department. Taking into consideration the present quarters and also the fact that these quarters are likely to be further circumscribed on account of the growing school population in this ward, the necessity for immediate action will, I am sure, be apparent to the members of the Board of Regents and to members of the Legislature.

Hardly less imperative is the need of a library. The completion of the other wing of the building will provide for this need and I feel certain that any extended argument is unnecessary.

II. In the second place we shall ask your Honorable Board to support our petition for sufficient funds to enable us to build a gymnasium. The architect was unable to provide accommodations for the physical training department in any part of the present structure. I believe here also the need is evident.

III. On account of the fact that the present building had to be brought forward on the campus and that this part of the campus is very much lower than grade, we shall need a small appropriation for filling and levelling the grounds.

Estimates already made indicate that we should have a legislative appropriation of approximately $170,000.00 adequately to provide necessary buildings and equipment for the Superior Normal School.

During the past three or four years the members of the faculty of the Superior Normal School have been attempting such revision of the course of study as would render the general efficiency of the school stronger than it has been. Even before the action of the Board last June we had attempted some work in segregation of the students into groups according to the grade of work which the pupils desired to follow after graduation. We were therefore ready to enter heartily into the plan outlined last year for a more complete grouping of our students.

We feel that another step forward was taken when we were able to make arrangements with the city authorities to do most of our student teaching in the city schools. With the experience of one quarter behind us, we feel confident that this method of practice work is highly to be preferred to the small group system. The splendid spirit shown by Superintendent Maddock and the principals of the different ward schools has made the task of organizing this work very pleasant indeed.

Although Your Honorable Body has already voted to establish a course for the training of commercial teachers in the Superior Normal

School, our finances were such that we were unable to undertake this work except incidentally. We are, however, making plans for entering upon this new line of professional work and we are asking for added appropriations to meet this demand.

We are also met with the demand in the northern part of Wisconsin for the establishment of an agricultural course. North Wisconsin has problems which are not met in the central and southern part of the State. It is therefore felt that some provision should be made for the preparation of teachers who could go out into the city and rural schools in this region and in an intelligent way supervise and direct the agricultural and industrial work of a developing section. This also will take some small extra appropriation which we feel sure your Board will be ready to recommend.

In the third place we desire to bring to your attention again the advisability of taking up some form of extension work. Almost every week the President receives letters from students and teachers in the northern part of the State asking permission to do correspondence work. This demand is growing. We believe the Normal Schools could do no better work than to establish in some of the schools regular extension departments so that these young people who, on account of financial conditions, are unable to be in residence, can take up work leading toward final graduation.

In closing I desire to add my thanks to those of the faculty for the generous support which has been accorded us by the members of your Honorable Body.

Respectfully yours,

V. E. McCASKELL,
President.

MILWAUKEE.

August 31, 1914.

Hon. THEODORE KRONSHAGE, President,
Board of Regents of Normal Schools.

DEAR SIR:—In addition to the report of this school giving figures for attendance and figures showing legislative appropriations and expenditures, it seems proper to submit a brief comment on some points connected with the work of the school for the two years last past and upon present needs.

GENERAL PROGRESS.

During the school year 1912–1913, the Milwaukee Normal school, under the direction of Acting President Walter H. Cheever, maintained the excellent reputation which it has heretofore enjoyed for good work and good spirit; it also maintained a healthy growth in attendance.

Upon assuming charge of the school on September 1, 1913, I found all arrangements made for beginning the work of the year, and was enabled to take up my duties without delay or embarrassment. I have had occasion throughout the year now closing to appreciate many times and in many ways the cheerful co-operation and good spirit of my fellow laborers in the school and of the students in attendance.

GROUNDS AND BUILDINGS.

The Milwaukee Normal school is situated within the limits of a great city, now numbering about 400,000 people. The city has built up very rapidly in the neighborhood and the land on all sides of the tract immediately adjoining the school is thickly covered with the residences of Milwaukee citizens. Adjacent to the grounds of the Normal School upon the north is the beautiful campus of Milwaukee-Downer college, with the handsome group of buildings devoted to the various uses of

that school. To the westward of the site originally purchased for the Normal School and to the westward of Downer College, by a very unusual combination of circumstances, there has remained vacant a considerable tract of land. This land has been much sought after, and, under ordinary conditions, would have been laid out into streets and into building lots upon which houses would have been erected, as similar houses have been erected on all sides just outside of this tract. By a fortunate series of events, it was made possible during the past year for the Normal School to obtain by purchase about 17 acres of this vacant property lying to the westward of the original Normal School site. The land thus secured, in addition to the land previously owned by the Normal School, has brought its holdings up to about 29 acres. There remains, near the middle of the southern front of the tract now owned by the Normal School a small plot of about four acres, which must be purchased by the Normal School which now has an option on the property at a reasonable figure. This option may be exercised and the land bought within a reasonable time. Lying to the northward of the western portion of the land which is now the property of the Normal School is another tract, comprising between 8 and 10 acres, upon which the Normal School can also exercise the option of purchase within a reasonable time and at a very reasonable price. It is important that this land, which is now available, but which, if not taken within a short time, can never be had for the uses of the School without a very heavy expenditure, be added at an early day to the ground already owned.

The School is situated in a thickly settled and rapidly growing residence district,—one of the finest in the city of Milwaukee. The School is already of such size and shows such certain evidences of increase in attendance that it is necessary to provide for a large student body and for the varied activities of a large school. Within a very few years there will be no open fields, no vacant lots, no place where the students of the school can find an opportunity for their physical activities and athletic exercises, except upon he grounds of the Normal School. With the growth of the institution, it will be necessary to provide dormitories which shall be the temporary homes of the students who attend from out of the city; it will be necessary to provide a site and playground space, as well as ground for school gardens, for the benefit of the Training or Model School; it will be necessary to have space for the erection of the buildings which will be required for the different activities and departments of the school; it will be necessary to have ample athletic grounds upon which the students, both men and women, may have an opportunity to engage in wholesome physical exercises, games, and sports; space for these activities will be necessary both in summer and in winter, if the physical tone of the members of the school is to be kept up in proper form. It is necessary, also, that the buildings and the athletic fields have some proper setting, and that there be some space within the Normal School grounds where students may stroll, or where they may meet for open air social activities in the proper season.

The school is now being put, as it were, into a plaster cast; after the lands surrounding the site are platted and used for the erection of residences and other buildings, it will be impossible to secure the needed land, except at a prohibitive cost. All the surrounding land will be platted and used in this way within the next two or three years if the land needed for the Normal School is not obtained within that time.

I desire, therefore, to call particular attention at this time to the necessity of taking this land for the use of the Normal School while it may be had upon advantageous terms. The purchase of the areas referred to will close the question of land for the Milwaukee Normal School. There is probably no spot in the normal school system in which the necessity for land purchase at this time is more important, or in which immediate action is more imperatively required.

The building originally erected for the school, with its large addition, is already fully occupied. By improving certain unoccupied space in the basement story of the building and by providing for the more complete utilization of its classrooms, a considerable increase in attendance may be obsorbed without rendering additional buildings for classrooms imperative. The school is, however, beginning to be crowded in certain of its departments, and within a very short time, if the attendance grows at the rate which has been shown in the past few years, additional school room will be necessary.

The most pressing need in the way of buildings, at this time, is the need for dormitory accommodations for the young women who attend the school from out of the city. There are now in attendance some 350 girls who are away from their homes and from their natural advisers,—their mothers; a large part of them are away from home for the first time. The school authorities make every effort to see that these girls are comfortably housed in homes where they are under good influences, and where they may have proper food. It is, however, exceedingly difficult to do this in all cases in the best way while they are in 150 or 200 different homes scattered throughout the city. The comfort of the young women who attend the school and whose homes are outside the city would be greatly promoted if dormitories were provided in which they might find school homes during the period of their attendance here; such accommodations would make possible a considerable saving in expense to these girls who attend from outside the city; dormitories would also make possible a much more wholesome and cheerful social life, and give them many advantages for social culture and for forming friendships and enjoying intimate association with their school mates which they do not now find possible under present conditions. Such a school home for the young women would also render it much less likely than at present that the distractions and the temptations to loss of time in unprofitable ways should encroach upon the time which these girls need and should employ in study or in wholesome social enjoyment or in the sleep which to students is so necessary.

It is very greatly to be desired that the land referred to above and a dormitory to constitute a school home for the girls who attend from out of the city, be provided at once.

ATTENDANCE.

The attendance at the School for the past five years has been as follows:

1909–1910	510
1910–1911	581
1911–1912	707
1912–1913	838
1913–1914	912

This shows a steady and gratifying increase; the future promise is that this will not be lessened. The work in the regular classes for the training of teachers has been carried on as usual. The special departments are coming to be more and more appreciated. The Kindergarten Department, the oldest of all the special departments in the normal schools of the state, shows a steady growth, and its graduates are increasingly in demand. The Art School graduated in June its first class of students who had made the complete preparation required, and were fitted to go out into the public schools of the state as special teachers and supervisors of drawing and art and their applications. The special department for Training Teachers of the Deaf, organized at the beginning of the school year 1913–1914, enrolled a class of good size, twenty-one in number, and graduated its first class of six students.

The action of the Board of Regents at the meeting in February, 1914, in establishing courses for the specific training of primary teachers, grammar grade teachers, high school teachers. principals of state graded schools, and superintendents of schools and principals of high schools, began an important movement which cannot fail to result in increasing value and effectiveness of the product of the schools.

A step important for this Normal School was also taken by the Regents at their annual meeting in June, in the establishment of the special department for training special teachers and supervisors of music for the public schools. No normal school in the middle or farther west is doing this work upon a plan so thorough and so well adapted to the needs of the public schools as is planned for this department in the Milwaukee school. Inquiries already made by prospective students show that the department will open in September with a good sized class in attendance.

THE ORGANIZATION OF SPECIAL DEPARTMENTS OF INSTRUCTION.

The school is growing to such size that it will soon be necessary to organize certain of the instructional departments, such as, for example, the Department of English, under recognized heads. With the increased number of instructors required for the work of such a department, it becomes impracticable for the general executive of the school to devote the time to the special needs of instruction in this branch which its importance indicates as proper. The instruction in some other subject also will, within a short time, demand organization in this manner, if the work is to be properly co-ordinated and if all teachers doing work in the department are to receive proper attention and be helped to understand alike the purposes, the plans, and the standards which are most desirable.

MODIFICATION OF TRAINING SCHOOL PLANS.

A change has been made during the year just closing in the plan of administering the Training School. This school is now used largely as a model school. Most of the teaching is done by the regular teachers; the students in their first year at the normal school come to the classrooms of the model school for observation, and thus have an opportunity to study, for some weeks, the work of these teachers of proved skill and training, before they are required to begin practice teaching. While the plan has been carried out to a considerable extent during the year just closed, it will be more thoroughly organized with the beginning of the new school year in September. The school will be hereafter properly a "demonstration" school rather than a "practice" or "training school".

EXTENSION CLASSES.

During the past year the school has made another important departure. A considerable number of the graduates of the school who are at work as teachers, and a considerable number of other teachers who are not normal school graduates, requested that the school organize classes in which they might continue their studies in certain subjects, or might take up subjects which were new to them, under the direction of normal school instructors. Acceding to this request, the normal school organized extension classes in a number of subjects during the year. These classes were kept within limits as to numbers; it was seldom permitted that more than ten such students should be in a class. The members of these classes studied during such time as they could make available through the week, upon lessons assigned by normal school instructors; on Saturday morning they came to the school for a two hour lesson, in order that they might receive the criticism, the instruction, and the inspiration of classroom discussion, under a careful and competent teacher.

The school had no funds to finance a venture of this kind; it was, therefore, necessary that the teachers constituting these classes should defray any cost. This they were willing to do, in order that they might receive the benefits of the normal school instruction and enjoy the use of the normal school equipment. The cost to them was, however, necessarily greater than the cost of work which is done under the direction of some other state institutions to which the state makes a liberal appropriation for carrying on extension work. There should be some recognition on the part of the incoming legislature of the need of such work as this at the normal schools, and it is highly desirable that at least a reasonable appropriation be made in the normal school budget for this purpose.

Respectfully submitted,

CARROLL G. PEARSE,
President.

Milwaukee, August 31, 1914.

WHITEWATER.

HON. THEODORE KRONSHAGE,
President Board of Regents of Normal Schools.

DEAR SIR:—I have the honor to make the following report of the Whitewater State Normal School for the two years, 1912–14:

ENROLLMENT.

	1912-1913	1913-1914
NORMAL DEPARTMENT		
Post Graduates	1	1
Senior Class	84	77
Junior Class	75	63
First Three Years of Five Year Course	80	69
Special Students	1	3
Correspondence Students	.....	3
School of Rural Education	48	43
College Course	9	6
Commercial Courses	.....	47
Totals	298	312
Number of Ladies	229	228
Number of Gentlemen	69	84
TRAINING SCHOOL		
Seventh and Eighth Grades	45	41
Fifth and Sixth Grades	48	51
Third and Fourth Grades	41	53
First and Second Grades	42	35
Sub-Primary	15	13
Kindergarten	35	34
Totals	226	227
SUMMARY		
Total in Normal Department	298	312
Total in Training School	226	227
Total in all Departments	524	539
In Summer School	217	270
GRADUATES		
Advanced Course	81	69
Elementary Course	11	.....
School of Rural Education	19	21
College Course	1	2
Commercial Course	.....	2
Totals	112	94

The two years have been marked by extensive improvements in the physical plant and its equipment and in numerous changes in the courses and in the organization of the school. There has been practically no change in the attendance but a decrease in the number of advanced course graduates. It is believed that this decrease will be overcome in the succeeding graduating classes.

The position of instructor in Latin has been abolished, and the number of instructors in English has been decreased by one. At the same time an instructor in Agriculture and assistant in Science has been added; also three instructors in commercial branches. We have lost, by more attractive salaries elsewhere, several teachers to other normal schools outside of the state. The increase in salaries granted by the Board in 1913 has helped to retain teachers who otherwise might have left Wisconsin. However, we are still at a disadvantage in the matter of salaries. The courses of study differentiated upon a language basis have been succeeded by courses based upon professional differentiation. The new courses authorized at the annual meeting of the Board of Regents have been worked out and announced in our June catalogue. The adoption of this basis of differentiation marks a forward movement in the professional standing of Wisconsin Normal Schools. We are now ready to prepare teachers for specific service. What we may lose in general culture will be more than compensated by the gain in professional training.

The most important change in the Whitewater Normal School during the biennium was the establishment of a department or school for the training of teachers of commercial subjects. The school was authorized in 1913, provision was made for its support in the 1913–15 budget, equipment purchased and faculty selected during the summer of 1913, and the school opened September 2, 1913. During the first six weeks 37 students were enrolled; the total enrollment for the year was 49, and 8 students taking regular normal courses were permitted to take a small amount of elective commercial work. In organizing this new school we have been fortunate in the selection of the course of study. It gives a maximum of training in commercial subjects and a minimum of theoretical work. There is no study common to both the regular Normal and the Commercial Course except Penmanship. This is an elective subject for all normal students. All other subjects in this department of the school are strictly commercial. A course in the Theory of Commercial Education and one semester's practice in teaching commercial subjects is required. It is already certain that this course will render real service to education in Wisconsin.

In the summer schools of 1913 and 1914 we anticipated the type of school now planned for succeeding years. In 1913 we offered, under Miss Potter's direction, a course in primary work for experienced teachers. This was attended by nine mature teachers in 1913 and by twenty-five such students in 1914. During the latter summer school work was offered in commercial subjects. Twenty-five students were in attendance. This seems to demonstrate the demand for special courses in the summer schools.

Among the physical improvements made during the two years are the new quarters for Manual Training. Domestic Science and Art, the president's office, and rooms for the Commercial School. A four-court tennis ground has been provided. The greatest improvement has been the purchase of additional ground and the construction of a fine athletic field. It includes a regulation baseball diamond, a football field, a half-mile running track, and a 100-yard running dash, which together with the gymnasium provided for by the last legislature will give Whitewater a model equipment for physical education.

Mention should be made of the annual pageant. In 1914 the seventh annual pageant was presented. In this instance the early history of

southeastern Wisconsin was depicted. The text was prepared and the staging done by a committee of the faculty. Three hundred students took part and presented a very interesting and accurate representation of some of the more striking facts of our history. Between three and four thousand visitors witnessed this historical pageant.

The needs of the school for the coming biennium are as follows. Teachers: An additional critic for service in the grammar grades; two instructors in the Commercial School—a teacher of Commercial English and a teacher of Commercial Arithmetic and Penmanship. As soon as the men's gymnasium is constructed the present temporary men's gymnasium should be remodeled to provide room for work in Chemistry, Physics, and Agriculture. The quarters now occupied by these departments will become available for the use of the growing Commercial School. We need a greenhouse for the use of the work in Botany and Agriculture. We need a commercial museum and extensive additions to the equipment for the teaching of shorthand, typewriting, and bookkeeping. A liberal allowance should be made to provide tablet armchairs to replace antiquated desks now in use.

Respectfully submitted,

A. H. YODER,
President.