

JOHN CLINTON SHRADER—A. M., M. D., LL. D.
Member State Board of Health from February, 1887 until
January 31, 1902. Was twice president of the board.

THIRTEENTH REPORT
OF THE
Board of Health

OF THE
STATE OF IOWA

FOR THE
PERIOD ENDING JUNE 30, 1906



DES MOINES
B. MURPHY, STATE PRINTER
1906

LETTER OF TRANSMITTAL

STATE OF IOWA,
OFFICE OF SECRETARY STATE BOARD OF HEALTH,
DES MOINES, July 1, 1905.

TO ALBERT B. CUMMINS, *Governor of Iowa*:

SIR: In accordance with the provisions of section 2565 of the Code, the Thirteenth Report of the State Board of Health for the period ending June 30, 1906, is herewith presented.

J. F. KENNEDY, *Secretary*.

BOARD OF HEALTH

President, R. E. Conniff, Sioux City.

Secretary, J. F. Kennedy, Des Moines.

Charles W. Mullan, Attorney-General, Ex-officio, Des Moines.

Paul O. Koto, State Veterinary Surgeon, Ex-officio, Forest City.

Charles Francis, Civil Engineer, Davenport.

R. E. Conniff (R), Sioux City, Fifth District, Term expires 1907.

F. W. Powers (R), Waterloo, First District, Term expires 1908.

J. H. Sams (R) Clarion, Fourth District, Term expires 1909.

A. M. Linn (H), Des Moines, Seventh District, Term expires 1910.

A. P. Hanchett (H), Council Bluffs, Sixth District, Term expires 1911.

A. C. Moerke (E), Burlington, Third District, Term expires 1912.

B. L. Elker (R), Leon, Eighth District, Term expires 1913.

The Second District is not represented.

Henry Albert, Iowa City, Director State Board of Health Bacteriological Laboratory, State University.

*Paul Shekwana, Iowa City, Bacteriologist.

C. N. Kinney, Drake University, Des Moines, Chemist.

*Since deceased and Selskar M. Gunn elected to vacancy.

PUBLIC HEALTH DISTRICTS

DISTRICT No. 1.—Allamakee, Butler, Bremer, Blackhawk, Buchanan, Chickasaw, Clayton, Delaware, Fayette, Floyd, Grundy, Howard, Mitchell, Winneshiek. Represented by Dr. F. W. Powers, Waterloo.

DISTRICT No. 2.—Benton, Cedar, Clinton, Dubuque, Iowa, Jones, Jackson, Johnson, Linn, Muscatine and Scott. Not represented.

DISTRICT No. 3.—Appanoose, Davis, Des Moines, Henry, Jefferson, Keokuk, Louisa, Lee, Mahaska, Monroe, Wapello, Washington, Van Buren. Represented by Dr. A. C. Moerk, Burlington.

DISTRICT No. 4.—Cerro Gordo, Calhoun, Emmett, Franklin, Hancock, Humboldt, Hamilton, Hardin, Kossuth, Palo Alto, Pocahontas, Webster, Winnebago, Worth, Wright. Represented by Dr. J. H. Sams, Clarion.

DISTRICT No. 5.—Buena Vista, Cherokee, Clay, Dickinson, Ida, Lyon, Osceola, O'Brien, Plymouth, Sioux, Sac, Woodbury. Represented by Dr. R. E. Conniff, Sioux City.

DISTRICT No. 6.—Audubon, Adair, Cass, Crawford, Carroll, Greene, Guthrie, Harrison, Monona, Pottawattamie and Shelby. Represented by Dr. A. P. Hanchett, Council Bluffs.

DISTRICT No. 7.—Boone, Dallas, Jasper, Marshall, Madison, Marion, Polk, Story, Tama, Poweshiek and Warren. Represented by Dr. A. M. Linn, Des Moines.

DISTRICT No. 8.—Adams, Clarke, Decatur, Fremont, Lucas, Mills, Montgomery, Page, Ringgold, Taylor, Union and Wayne. Represented by Dr. B. L. Elker, Leon.

When vacancies occur in the State Board of Health, it shall be the duty of the governor to appoint to membership on the board, physicians residing in the various health districts until seven such districts are represented on the board. After which time the annual appointment shall be made from the physicians residing in the district not represented on the board the preceding year.—*The Code.*

FOREWORD

The Statute (section 2565 of the Code) makes it the duty of the Secretary of the State Board of Health to present to the Governor, biennially, a report of the Board that shall "include so much of its proceedings, such information containing vital statistics, such knowledge respecting diseases, and such instruction on the subject of hygiene as may be thought useful for dissemination among the people, with such suggestions as to further legislation as may be thought advisable."

In the preparation of this report I have endeavored to comply with the requirements of the Code as fully as possible. The report of the Director of the Bacteriological Laboratory of the State Board of Health will be found very full and complete and the exhibit of the work done from its establishment to the present time should be a source of pleasure to every member of the legislature as well as to the citizens of the state generally. As the years go by the people will more and more realize the great importance of this department.

In the part of the report relative to the registration of vital statistics it will be noticed that Iowa is still in transition so far as the laws and practical methods are concerned. Because of some objectionable features in chapter 100, laws of the Thirtieth General Assembly, a radical change was made by the enactment of chapter 109, Thirty-first General Assembly.

In addition to the report of the meetings of the Board there will be found a number of valuable papers upon sanitary matters and preventive medicine—giving practical and reliable information upon subjects that should be more generally known by our people.

It will be noticed that the report instead of being biennial is a triennial one. The biennial report ending June 30, 1905, was duly placed in the hands of the Governor and sent to the state printer, but its printing was so much delayed that the legislature upon the request of the secretary, ordered it returned without completion.

J. F. KENNEDY, Secretary.

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I

BOARD MEETINGS

August 5 and 6, 1903.	May 18, 1905 (Special).
November 11 and 12, 1903.	June 16, 1905 (Special).
February 17 and 18, 1904.	July 27 and 28, 1905.
May 18 and 19, 1904.	August 8, 1905 (Special).
July 20 and 21, 1904.	November 1 and 2, 1905.
October 19 and 20, 1904.	January 15 and 16, 1906.
January 30 and 31, 1905.	April 10 and 11, 1906.
April 12 and 13, 1905.	May 16, 1906 (Special).

The proceedings of these meetings were published in detail in the Iowa Health Bulletin—the official organ of the Board, which is edited by the Secretary and hence there will be presented herewith only a summary of the

FINANCES OF THE BOARD

The annual appropriation for the expenses of the Board is \$5,000 or \$10,000 for the biennial period.

The Board entered upon the biennial period with a deficit of \$755.69 which was provided for by a special appropriation of \$762.34 by the Thirtieth General Assembly, section 30, Chapter 146.

A detailed classified statement of the expenses has been filed with the Executive Council and is a part of its report and hence it will only be necessary to reproduce a summary:

Members expense account for attendance upon the meetings.....	\$1,924.60
Attendance upon conferences, etc.....	903.31
Postage	820.84
Printing and binding	1,797.05
Secretary's salary	2,400.00
Stenographer's salary	1,560.00
Additional clerk hire.....	497.00
Stationery	128.18
Book and periodicals	54.35
Special Investigations	17.50
Drawing and Engraving	14.58
Instruments	9.15

Telephone	\$ 37.80
Express	27.64
Telegraph	18.37
Miscellaneous	72.50
Deficit at beginning of Biennial Period	755.69

Total expenditures for biennial period ending June 30, 1905..\$11,038.56

The following is a classified summary of expenditure for the fiscal year ending June 30, 1906;

Board Meetings—Members expense account.....	\$ 847.01
Other Official Expenses.....	423.10
Salaries and Clerk Hire.....	2,529.00
Postage.....	320.00
Printing, Stationery, etc.....	1,289.13
Books and Miscellaneous.....	74.23
Telephone and Telegraph.....	47.91
Expressage.....	12.31

Total

This does not include a deficit of \$146.32 at the beginning of the fiscal period which was paid by a special appropriation by the Thirty-first General Assembly.

EMBALMERS' DEPARTMENT

In addition to the foregoing financial statement of the State Board of Health proper the following exhibit shows the receipts and expenditures of the Board on behalf of the Embalmers' Department for the fiscal year ending June 30, 1906:

RECEIPTS

Examination Fees.....	\$ 375.04
Renewal Fees.....	728.00
Reciprocity Fees.....	70.00

Total receipts

These receipts were turned into the State Treasury as required by chapter 7, Thirtieth General Assembly.

EXPENDITURES

The expenditures on behalf of the Embalmers' Department for the fiscal year, upon warrants issued by the State Auditor, were as follows:

Conducting examinations.....	\$ 480.78
Printing and envelopes.....	16.75
Postage.....	54.00

Total

Leaving for the fiscal period an unexpended balance in the State Treasury of \$621.47.

In regard to the embalmers' department, the Secretary desires to make the following explanation:

The Code, section 2565, says: "The Board (of Health) shall have charge of and general supervision over the interest of health and life of the citizens of the state, * * * authority to make such rules and sanitary investigation as it from time to time may find necessary for the preservation and improvement of the public health."

Very serious results had occurred by the shipment of bodies dead from infectious diseases. In one case a child was shipped from Chicago to a town in Ohio—the cause of death being diphtheria. On arriving at its destination the casket was opened—the cause of death not having been certified to, and, as a result every member of the family receiving the remains, five in number including the grandfather, contracted the disease in a very malignant form and died. This and other cases more or less similar, and the accidents to trainmen handling coffins, not properly protected, led to a joint conference between State Boards of Health, General Railway Baggage Agents and the National Funeral Directors' Association, at Chicago, at which the Secretary of the Iowa Board, the writer, was present. The consensus of opinion was that it was imperatively necessary, for the proper protection of the public health to formulate and enforce such uniform rules and regulations as would enable undertakers to prepare, and railways to carry such bodies, if not with perfect safety, with as little danger as possible.

The state of Iowa was among the pioneers in this move. Under the first rules adopted bodies dead of smallpox, diphtheria, scarlet fever, cholera, typhus fever and plague could not be shipped at all, and bodies dead from other diseases could only be shipped when prepared by certain specified methods and one of the provisions was that bodies that could not reach their destination within forty-eight hours after death could only be prepared and shipped by a licensed embalmer.

It was found later that by improved methods of embalming and disinfection bodies dead of all the prohibited diseases above named, except Bubonic Plague could be prepared and shipped with safety, and the rules were revised accordingly and adopted by the American Public Health Association, by the National Conference of State and Provincial Boards of Health, by the National General Baggage Agents Association and by the National Funeral Directors Association.

Upon the adoption of these rules Iowa and several of the states faced a condition that they were unprepared for. There were no licensed embalmers in the state, and no provision in the law for issuing such license. Our undertakers who were called upon to ship bodies within or beyond the state found that they could not be shipped or if shipped at all they were liable to detention and great embarrassment, as the railroads above referred to had been furnished with copies of the joint resolution and were anxious in the interests of their own men to do their part toward enforcing these rules.

In this dilemma Attorney-General Remley was appealed to, and decided that under the section of the Code above referred to the Board had authority to make and enforce such rules and regulations respecting the transportation of corpses. The question then arose who was to

license these undertakers as embalmers and under what condition. Many undertakers themselves were very anxious to submit to such examination by the State Board of Health which seemed to be the logical body to conduct such examinations inasmuch as Physiology, Anatomy, Hygiene and Disinfection suggested themselves as essential subjects for them to be instructed in and examined upon.

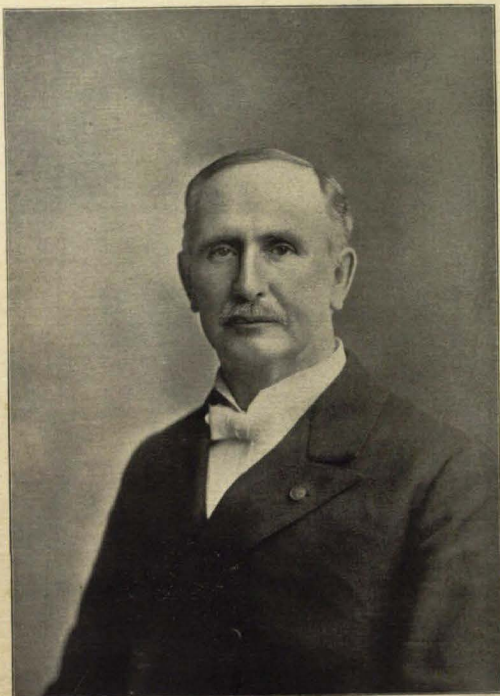
In order to meet the expenses incident to examinations, postage, printing, etc, the Board, upon the solicitation of undertakers, charged a nominal fee for examinations, renewals, and for embalmers' permits by reciprocity and, as a result of satisfactory examinations, have issued embalmers' licenses to 857 applicants and thus enabled them to ship dead bodies without interruption not only to any state in the Union but to Canada, Mexico, Cuba and the South American states as well as to receive bodies from the Governments named.

These fees were never in the nature of a demand but were rather paid as a privilege and until the adoption of chapter 7 laws of the 30th General Assembly were applied to meeting the necessary expenses of the department.

Since chapter 7 above referred to came into effect these fees have been turned into the State Treasury and there is now in the hands of the State Treasurer from this fund nearly if not quite \$1000.

There are now on file and have been presented to the Executive Council bills amounting to nearly \$200 which have been duly itemized and certified to. These claims though due for services faithfully rendered in connection with this department have been rejected by the Executive Council on the ground, so far as expressed that there is no authority for the payment of the claims; and Attorney-General Mullan so far as he has expressed himself to the Secretary doubts the authority of the Board to require or accept such fees since there is no provision in the law for such action. He further suggests that the proper thing to do is to have the next General Assembly enact a law providing for the examination and licensing of embalmers, the collection of fees and their proper disposal, and the legalizing of the acts of the Board of Health, the State Treasurer and the Executive Council thus far in this matter.

A Bill embodying the above suggestion was introduced at the last session of the Legislature which failed to receive proper consideration because of its late introduction. It is to be earnestly hoped that early in the session of the Thirty-second General Assembly such a bill may be enacted.



JOSIAH FORREST KENNEDY A. M., M. D., Secretary State Board of Health
from May 5, 1885, until January 31, 1907.

II

IOWA HEALTH DEPARTMENT

BY JOSIAH FORREST KENNEDY, SECRETARY.

ORGANIZATION

The health department of the state of Iowa was created by the enactment of Chapter 151, Eighteenth General Assembly in the year 1880, and the first members of the Board appointed by Governor J. H. Gear, were as follows:—J. F. McJunkin, Washington, Attorney General; James L. Loring, Dallas Center, Civil Engineer; Dr. M. Stalker, Ames, Veterinary Surgeon; Dr. William S. Robertson, Muscatine, President; Dr. Wilnot H. Dickinson, Des Moines; Dr. George F. Roberts, Waterloo; Dr. Justin M. Hull, Lake Mills; Dr. Philip W. Lewellen, Clarinda; Dr. Henry H. Clark, McGregor; Dr. Ephraim M. Reynolds, Centerville; Mr. L. F. Andrews of Des Moines, was elected Secretary.

FUNCTIONS

Under the statute then enacted the Board was given, as now, a general supervision of the lives and health of the people; the power to make rules and regulations for the prevention and the restriction of the spread of infectious and contagious diseases dangerous to the public health; and the supervision of a registration of births, deaths and marriages, with the declaration that such rules and regulations when adopted and published should have the force of law and should be obeyed and enforced by all local boards, police officers and the people generally.

The law provided that marriages should be reported by the respective county clerks to the Secretary of the State Board of Health from the returns made to him by clergymen and other officiating officers; while births and deaths were to be reported to him by physicians, midwives, householders or guardians, and later be reported by him to the Secretary of the State Board of Health. The law relating to births and deaths has been changed three or four times, the State Board of Health being the registrar of the data above named. Chapter 109 Thirty-first General Assembly which goes into effect July 4th makes the Secretary of the State Board of Health, the State Registrar.

New duties have, however, from time to time been imposed upon the Board. In addition to those above stated it has a general supervision of the sale, testing and handling of illuminating oils, linseed oil and miners oil; the duty of examining and testing lamps intended for burning

gasolene. It also regulates, in the interests of the public health, the burial, disinterment and transportation of dead bodies.

The Legislature recently gave the state another important duty that of going into local jurisdiction and assuming the duties of local boards where such boards neglect or refuse to afford the protection provided by law when there is an outbreak of infectious diseases.

EMBALMERS' DEPARTMENT

Under the clause in the law giving the State Board a general supervision of the lives and health of the people, a department of embalming was established, as is set forth more fully elsewhere in this report. Rules and regulations were adopted relative to the conducting of funerals and the burial, disinterment and transportation of the dead. In order to carry out these rules and to comply with similar requirements in other states, in the transportation of corpses, the Board has conducted an examination of funeral directors twice annually, and has issued to those receiving, as a result of such examination, a rating of seventy-five per cent, an embalmers' permit. These examinations are conducted by representatives of the Board and of the Iowa State Funeral Directors' Association, conjointly. They are, though somewhat technical, practical in character, and are partly written and partly oral, with demonstrations upon the cadaver. The total number of embalmers permits issued from the organization of the department to include June 30, 1906, is 857. Of this number 834 were on successful examination, and 23 on reciprocity. During this period there were 910 examined of whom 76 failed to pass.

For the period embraced in this report June 30, 1903, to June 30, 1906, there were 244 examined of whom 37 failed to pass. There were 230 permits issued, 207 on examination and 23 by reciprocity. The result has been a great improvement in the personnel and qualifications of those thus licensed; and a great incentive to scientific study and endeavor in the science and art of embalming has been aroused. The benefit from the sanitary point of view has been the better protection of the people against the spread of infectious diseases.

MEDICAL DEPARTMENT

Another important function of the physicians of the State Board of Health, which may be incidentally mentioned, is their work as a Board of Medical Examiners. This department was organized by the Legislature in 1886 and since that time there have been issued upon diploma, upon examination, and upon "length of practice", in all, 7983 certificates of which 7943 were to physicians and 40 to midwives. The Board has also issued 403 certificates to Osteopaths 300 of which were upon "previous practice in Iowa" and 103 upon examination. Since the law went into effect requiring an examination of all persons beginning practice in Iowa (January 1, 1899) the total number of certificates issued was 1502. Of this number 1439 were upon successful examination and 123 by reciprocity. The certificates issued were classified as follows: Regular, 404; Homeopaths, 142; Eclectics, 15; Physio-Medics, 1.

For the three years embraced in this report 698 certificates were issued of which 595 were upon successful examination and 103 by reciprocity. These certificates were classified as follows. Regulars, 632; Homeopaths, 62; Eclectics, 4.

In addition to the foregoing the Board has issued 72 itinerant physicians' licenses and renewals, the fee for each of which is \$250.00 aggregating \$18,000.00 all of which has gone directly into the State Treasury. The grade of examination required by the Iowa Board is such as to enable the holder of an Iowa certificate, granted upon examination, to obtain a similar certificate without examination in any other state in the Union having a law permitting such reciprocal interchange.

Neither the embalmers nor the medical department has been any expense to the state, the fees received meeting all the expenses of examination, printing, postage, etc., and leaving a handsome balance in the State Treasury.

EDUCATIONAL

Another important line of work extensively employed by the Board, for the education of the people, is the printing and distribution of circulars, blanks, etc. The Iowa Health Bulletin, published monthly, has just closed its nineteenth year. The present edition numbers 10,800 copies, and is sent to every person connected in anyway with the work of the Board to every state and county official; to every state in the Union, and to many foreign countries as well as to every physician and layman asking for it. It is the official organ of the Board and contains a large amount of useful and interesting information relative to hygiene and sanitation including the cause and prevention of infectious diseases. It is, and has been, edited by the present Secretary of the Board since its first issue. Other circulars, official and semi-official publications are as follows:

- Glanders in Man and Domestic Animals—Andrews.
- Adulteration of Food—Farquharson.
- Diseases of Domestic Animals—Stalker.
- Sewerage, Drainage and Disposal of Excreta—(1881) Loring.
- Smallpox Hospital—Farquharson.
- Ventilation—Hull.
- Hospitals for Contagious Diseases and their Proper Location—The Board.
- Geology and Topography of Iowa from a Sanitary Point of View—Farnsworth.
- Treatment of the Drowned—The Board.
- Sanitary Science and Public Hygiene—Robertson.
- Sanitary Science and Hygiene—Farquharson.
- Hygiene of Public Institutions—Reynolds.
- Over-Pressure in Schools—Robertson.
- Lighting and Seating School Houses—Andrews.
- Study out of School Houses—Parish.
- Communication of Contagious Diseases by Second-Hand School Books—Clark.

Rest—Reynolds.

The Opium Habit—Hull.

The Typhoid Fever of America—Farquharson.

Typhoid (Enteric) Fever—Kennedy.

Hygiene of the Unborn—Moorehead.

Tuberculosis in Cattle—Stalker.

Thermometry of Hygiene—Benjamin.

Ventilation—Shrader.

Potable Water—Davis.

Street Payments from a Sanitary Standpoint—Andrews.

Iowa's Duty to the Insane—Gilman.

Disposal of Sewage (1891)—Loring.

Disposal of Household Waste—Becker.

Money Value of Sanitation—Andrews.

Animal Diseases (1891)—Stalker.

Nosological Table of Diseases—Kennedy.

Hog Cholera—The Board.

Veterinary Science and Its Relation to the Public Health—Kennedy.

Disinfection of Woolen Rag Mattresses, Bed Quilts, Carpets and Upholstered Furniture—The Board.

The Hygienic Treatment of Consumption—Kennedy.

Emergency Hospitals—The Board.

Rules and Regulations for the Inspection of Illuminating Oils and Linseed Oil—The Board.

Prevention of Disease, Slaughter Houses, Diseased Animals and Nuisances—The Board.

Disposal of Sewage of Isolated Country Houses—Gerhard.

The foregoing were printed by the Board from time to time and distributed in large numbers, several of them passing through two or three editions. All are now out of print.

The following circulars are in force at present and can be furnished by the Secretary:

No. 1. Quarantine and Disinfection of Contagious Diseases.

No. 2. Regulations for Local Boards of Health.

No. 3. Restriction and Prevention of Contagious Diseases in the Public and Private Schools of Iowa.

No. 4. An ordinance for the protection of the Public Health—For Cities and Towns.

No. 5. The Inspection of Illuminating Oils and Linseed Oil.

No. 6. Rules and Regulations for Adoption by Township Boards.

No. 7. Smallpox.

Form 29 K, Directions for water analysis.

Form 50 B, Regulations for the Use of Kerosene and Gasoline.

Forms y and w, rules for the transportation of corpses.

There are also prepared and sent out by sample as called for various "Forms and blanks" helpful and indispensable in the routine practical work of local boards of health which are furnished by the Secretary when applied for. In addition to all the foregoing there have been prepared and published twelve biennial reports giving somewhat in detail the work

of the State Board and furnishing a large number of highly interesting, useful and practical articles furnished by the members of the Board and others relating to the public health. It will thus be seen that one of the most earnest efforts of the Board has been along educational lines believing that no successful sanitary ends can be attained until the people are properly educated as to the necessity and results of such efforts.

PREVENTIVE MEASURES

The Board has largely, it may be said almost exclusively, relied upon isolation, quarantine, disinfection and vaccination in its preventive and restrictive efforts, well assured that when these measures are promptly, impartially and faithfully applied, all communicable diseases will be promptly stamped out. If every community in every state was to adopt and enforce these simple measures such diseases as smallpox, diphtheria, measles, scarlet fever, typhoid fever, cholera, tuberculosis, etc., would soon be unknown.

REGISTRATION OF VITAL STATISTICS

The Board in accordance with a law passed by the Thirtieth General Assembly is about to inaugurate a system of registration of births and deaths that promises to put Iowa in the front rank of registration states. One of the most conclusive indications of the intelligence of the State is the complete and reliable registration of its births, deaths, marriages and divorces. Few states in the Union have this, though there is an earnest effort being made in many states to properly register and preserve such data. Iowa has just reason to be proud of her efforts to place herself so well to the front in this respect as to merit the commendation of the United States Census department.

The former was written before the passage of Chapter 109 by the Thirty-first General Assembly an act that removed Iowa from her proud position as a registration state and so far as the reporting of births are concerned again commits the state to a system abandoned as a failure by every state that has tried it. More however will be said upon this subject elsewhere in this report.

RESULTS

It is impossible to estimate the amount of good accomplished by the Board during its twenty-six years of service. Its chief efforts have been to prevent the outbreaks of infectious diseases and to prevent their spread when any locality has been so unfortunate as to have such a calamity. The Board has thought to do this by the education of the people and by the machinery provided by the law. The law makes it the duty of every physician to report at once in writing to the mayor or the township clerk as the case may be any infectious disease he may be called upon to attend. It, therefore, becomes the duty of the officer thus notified to at once either quarantine or placard the premises with the name of the disease and to prohibit persons from leaving or going onto the premises thus quarantined. It is also his duty to maintain and release the quarantine in accordance with the rules and regulations of the State Board.

Physicians often assume to do this work, though there is no authority in the law or in any rule or regulation for the assumption of such responsibility as establishing, maintaining or releasing quarantine.

It may safely be assumed that the work of the Board as above outlined has prevented many outbreaks of infectious diseases, or restricted their spread, and has thus prevented much sickness; saved many valuable lives; and brought to her people a much greater degree of health and happiness. Owing to the liberal education of the people in sanitary and preventive methods, and because of liberal provision made by the Thirtieth General Assembly, the health department of the state is prepared to do better work in the future, and with more clearly marked beneficial results than heretofore. There has been persistent and faithful seed sowing and the harvest is in sight. The establishment of a bacteriological department, under the auspices of the State Board of Health, in connection with the State University, and the appropriation for the investigation of tuberculosis, its cause, treatment in sanatoria, and its prevention open up splendid fields for practical work that cannot but greatly benefit the people of the state.

MEAGRE APPROPRIATION

All this work has been done by the State Board of Health on an economical basis, so far as appropriation is concerned, unequaled even approximately, by any state in the Union. This fact is not stated however in commendation, as a more liberal appropriation than \$5000 annually, would have strengthened the office force and furnished funds that would have more greatly aided in the various duties above named, and would have enabled the Board to have taken up other important lines of work such as water analysis, food inspection, etc.

PERSONNEL OF THE BOARD

The following is a complete roster of the State Board of Health since its organization to the present time:

ATTORNEY GENERALS

J. F. MCJUNKIN, Washington, 1880 to January 1, 1881.
SMITH MCPHERSON, Red Oak, 1881 to 1885.
ANDREW J. BAKER, Centerville, 1885 to 1889.
JOHN Y. STONE, Glenwood, 1889 to 1895.
MILTON REMLEY, Iowa City, 1895 to 1901.
C. W. MULLAN, Waterloo, 1901 (time unexpired).

STATE VETERINARY SURGEONS

M. STALKER, Ames, 1884 to 1896.
JAMES I. GIBSON, Denison, 1896 to 1902.
PAUL O. KOTO, Forest City, 1902 (term unexpired).

CIVIL ENGINEERS

JAMES L. LORING, Dallas Center, 1880 to 1894.
WARREN DICKINSON, Des Moines, 1894 to 1901.
CHARLES FRANCIS, Davenport, 1901 (term unexpired).

PHYSICIANS

*W. S. ROBERTSON (R), Muscatine, 1880 to Jan. 20, 1887—Date of death.
*WILMOT H. DICKINSON (H), Des Moines, 1880 to 1889.
GEORGE F. ROBERTS (H), Waterloo, 1880 to 1883.
*JUSTIN M. HULL (E), Lake Mills, 1880 to 1886.
*PHILIP W. LEWELLEN (R), Clarinda, 1880 to 1892.
HENRY H. CLARK (R), McGregor, 1880 to 1893.
*EPHRAIM M. REYNOLDS (R), Centerville, 1880 to 1894.
*S. B. OLNEY (H), Fort Dodge, 1883 to 1890.
JAY D. MILLER (E), Ida Grove, 1886 to 1890.
*JOHN C. SHRAKER (R), Iowa City, 1887 to 1902.
FREDERICK BECKER (H), Clermont, 1889 to 1896.
*E. A. GUILBERT (H), Dubuque, 1890 to March 4, 1900—Date of death.
E. H. CARTER (E), Des Moines, 1891 to 1898.
J. M. EMMERT (R), Atlantic, 1892 to 1896. (Resigned).
R. E. CONNIFF (R), Sioux City, 1893 (term unexpired).
J. A. SCROGGS (R), Keokuk, 1894 to 1901.
W. BANCROFT (H), Keokuk, 1896 to 1901. (Resigned).
J. A. MCKILVEEN (E), Charlton, 1898 to 1905.
HENRY MATTHEY (R), Davenport, 1899 to 1906.
C. B. ADAMS (H), Sac City, 1900 to 1904.
A. M. LINN (H), Des Moines, 1901 (term unexpired).
F. W. POWERS (R), Waterloo, 1901 (term unexpired).
J. H. SAMS (R), Clarion, 1902 (term unexpired).
A. P. HANCHETT (H), Council Bluffs, 1904 (term unexpired).
A. C. MOERKE (E), Burlington, 1905 (term unexpired).
B. L. EIKER (R), Leon, 1906 (term unexpired).

BACTERIOLOGICAL DEPARTMENT

HENRY ALBERT, Iowa City, Director Laboratory.
*PAUL SHEKWANA, Iowa City, Bacteriologist.

SECRETARIES

L. F. ANDREWS, Des Moines, 1880 to 1881.
*R. J. FARQUHARSON, Davenport, 1881 to 1885.
J. F. KENNEDY, Des Moines, 1885 (term unexpired).

*Deceased.

III

VITAL STATISTICS

BY J. F. KENNEDY, M. D. SECRETARY STATE BOARD OF HEALTH

Iowa's record relative to a registration of births and deaths has not been a very satisfactory or creditable one. The fault has not been so much with the law as with the practical operation of it. The very first law passed in 1886, twenty-six years ago, providing for the organization of the State Board of Health made provision for a registration of vital statistics—marriages, births and deaths—that ought to have required nothing further. It was an act similar to those in force in the New England states and in Illinois and where faithfully observed had given most satisfactory results. We regret to state that so far as reporting births and deaths were concerned the law was in advance of the intelligent and professional honor of so large a number of our physicians as to render the returns from that source practically worthless for sanitary or scientific purposes. A large number could see no necessity for such records and many others were unwilling to make the returns because there was no pay in it for them. Their commercial interests were dearer than any professional or patriotic considerations. There was no trouble with the reports of marriages, as no one could be married without a license, and every officiating minister or magistrate was obliged to make a return of each marriage to the clerk issuing the license.

This feature of the law has never been changed except that under chapter 109 laws of the Thirty-first General Assembly the time for making these reports by the clerks of the district courts has been changed so as to terminate with the fiscal instead of with the calendar year.

The simple provision of that law was that every person conducting a marriage ceremony should report the same to the clerk of the district court with certain data required by blanks furnished by the State Board of Health. These reports were recorded in the clerk's office and a transcript of them sent to the Secretary of the State Board of Health for the year ending December 31, immediately preceding. The law further provided that every physician, coroner or midwife officiating at the birth or death of any person within the state of Iowa should report to the clerk of the district court within a spec-

fled time such facts respecting these births or deaths as were required by the State Board of Health. These reports were sent by the clerk to the State Board of Health together with the reports of marriages filed in their office. This was, and is, a very satisfactory method where physicians, midwives and coroners as well as the clerks of the district courts perform the respective duties required of them.

This law failing to secure an adequate and reliable return of births and deaths was, so far as relates to these data, repealed and the duty of collecting records of births and deaths was laid upon the assessors who were furnished by the County Auditors with blanks prescribed by the State Board of Health. The data prescribed were to be obtained by the assessors in connection with their regular official work, in ascertaining the value of property, number of hogs, cattle, etc., and the returns, so far as births and deaths were concerned, were made by the assessors to the clerks of the district courts, and abstracts from these reports were sent to the office of the State Board of Health.

That method after ample trial was such a complete failure and such a travesty upon any reliable registration that another effort was made by the Legislature of 1904. A bill was passed modelled after the Michigan law relating to deaths and births, and, as in Michigan making the Secretary of State the registrar of vital statistics. Unfortunately there was no additional appropriation, and hence no provision for the payment of additional clerical and other contingent expenses. The Secretary of State learning of the passage of this bill asked the Governor to withhold his approval, which was done, and the Bill was returned to the General Assembly for revision. As a result the main features of the Bill were retained and the work and responsibility divided between the Secretary of State and the State Board of Health, and, as thus modified, it passed a kind of double-headed measure.

The full text of this law is as follows:

CHAPTER 100

REGISTRATION OF BIRTHS AND DEATHS

H. F. 418

AN ACT to require the registration of births and deaths in Iowa. [Additional to chapter sixteen (16) of title twelve (XII) of the code, relating to the state board of health].

Be it enacted by the General Assembly of the State of Iowa:

SECTION 1. STATE REGISTRAR OF VITAL STATISTICS. That for the complete and proper registration of births and deaths for legal, sanitary and statistical purposes, the state board of health is hereby constituted state registrar of vital statistics, and it shall be his (its) duty to promulgate and enforce all necessary rules and regulations that may be required to carry out the purpose of this act.

SEC. 2. LOCAL REGISTRARS—SUB-REGISTRARS. Local registrars of vital statistics shall be the health officers of cities and the clerks of townships. Each local registrar shall at once, upon his election or appointment, appoint a deputy, subject to the approval of the state board of

health, who shall act as registrar in case of his absence, illness or other disqualifications, and the state board of health may also appoint, as sub-registrars, the clerks of all incorporated villages and not more than three other persons in each township, to file certificates of births and deaths, transmit them to the township registrars, and to issue burial and removal permits as hereinafter provided.

SEC. 3. CERTIFICATES OF DEATH—BURIAL OR REMOVAL PERMITS. The undertaker or person in charge of the funeral of any person dying in Iowa shall cause a certificate of death to be filled out, with all the personal particulars contained in the standard blank adopted by the U. S. census, and with a statement of cause of death by attending physician, or, in his absence, by the health officer or coroner, and shall file it with the local registrar before the body is interred, deposited in a vault or otherwise disposed of, or removed from the township, village or city in which the death occurred. On receipt of a certificate of death properly and completely filled out, the local registrar shall issue a burial or removal permit, and no sexton or superintendent of a cemetery shall permit interment, and no railroad or other transportation company shall permit shipment, of a body unaccompanied by a registrar's burial or removal permit.

SEC. 4. CERTIFICATES OF BIRTH. A certificate of birth of the standard form adopted by the U. S. census shall be made out by the physician, midwife, or other person attending the birth of every child born in Iowa, or in default of such person by the parent, householder, superintendent of an institution, or other responsible person, and filed with the local registrar of vital statistics within ten days after the birth. In case the child is not named, the registrar shall deliver a supplementary blank for report of given name to the person filing the certificate, to be filled out and returned as soon as the child shall be named.

SEC. 5. MONTHLY REPORTS. Sub-registrars shall deliver all certificates of births and deaths filed with them for any month to the township registrar on or before the third day of the following month. Local registrars shall record and number, in order of filing, all certificates of births and deaths, including those filed by sub-registrars, and on the fifth day of the following month shall mail them to the state board of health in a stamped return envelope provided by the state board of health and include a statement card showing the number returned, with their registered numbers, and that no other births and deaths have occurred and failed to be registered. In case no births or deaths have occurred, then the local registrar shall make a report to that effect upon a postal card blank provided by the state board of health.

SEC. 6. DUTIES OF SECRETARY OF STATE—COMPENSATION OF REGISTRARS. The Secretary of state shall furnish blank certificates of birth and death to physicians, undertakers and local registrars, and shall supply local registrars with all necessary blanks, forms and instructions for the effective execution of the law. He shall, annually, certify to the

board of supervisors of each county the number of certificates of births and deaths received from each local registrar, for each of which, when completely and properly made out and properly transmitted to the secretary of state on the fifth day of the following month, the local registrar shall be entitled to the sum of twenty-five cents (25c) to be paid out of the county fund. Provided, that for certificates originally filed with sub-registrars, completely made out and properly transmitted, the sub-registrar shall receive ten cents (10c) each and the registrar shall receive fifteen cents (15c) each; provided further, that city registrars of cities having ten thousand (10,000) population or more by the last U. S. census shall receive no special compensation other than that included in their salaries for acting as registrars under this act. Each report of "no death" or "no births" shall be included in the warrant for payment as one certificate.

SEC. 7. MISDEMEANOR. Any undertaker, person acting as undertaker, physician, midwife, sub-registrar, local registrar, sexton, agent of a transportation company, or other person violating any of the provisions of this act or failing to properly register a birth or death as herein required, shall, upon conviction, be considered guilty of a misdemeanor, and shall be fined not less than five (5) and not more than one hundred (100) dollars, or be imprisoned not more than sixty (60) days, or be subjected to both such fine and imprisonment, at the discretion of the court. It shall be the duty of the prosecuting attorney in each county, upon complaint of a local registrar or the state board of health, to aid in the enforcement of this act, and the state board of health shall endeavor to see that it is uniformly and officially executed throughout the state.

SEC. 8. REPEALED. All acts and parts of acts inconsistent with this act are hereby repealed.

Approved April 13, A. D. 1904.

This act, as will be seen provided that health officers of cities and towns, and township clerks should be local registrars for their respective districts and should receive and send to the State Board of Health on the 5th day of each month all certificates of births and deaths filed with them for the month immediately preceding. It was the duty of the undertaker to have a certificate of death properly made out and signed by the physician giving the cause of death. This certificate was filed with the local registrar by the undertaker, who issued to him a burial permit. It was made a misdemeanor, punishable by a fine, to inter a body in any cemetery or private burying ground within the state of Iowa without such permit.

It was also made the duty of the physician, midwife or parents to make out a certificate of birth on blanks furnished by the State Board of Health and to file the same with the local registrar within ten days after such birth. A neglect or failure to comply with this provision of the law was also made a misdemeanor and punishable by fine.

The practical operation of this law was very unsatisfactory. The duties of the Secretary of State and the State Board of Health were not clearly defined and differentiated, but by mutual agreement certain

duties under the law were assumed by each and carried out. The same difficulty with the physicians was encountered many of them neglecting to send in their reports of births and the undertakers in many instances, reported that they had hard work to get the death certificates showing the cause of death, signed by the medical attendant. It soon became apparent that the law was a failure so far as securing reliable data respecting births and deaths was concerned; and when the Thirty-first General Assembly met a bill was presented that had been prepared by the Secretary of the State Board of Health, Secretary of State and by Dr. Leech, Chairman of the Committee on Public Health in the House. This bill met with opposition in the committee on Public Health and a substitute was introduced which with some modifications was passed—becoming Chapter 109 Thirty-first General Assembly which is as follows:

CHAPTER 109

REGISTRATION OF BIRTHS AND DEATHS

H. F. 86

AN ACT to require and regulate the registration of births and deaths in the state of Iowa, and to repeal section two thousand five hundred sixty-six (2566) and two thousand five hundred sixty-seven (2567) of the code, and to repeal chapter one hundred (100) laws of the Thirtieth (30) General Assembly.

Be it enacted by the General Assembly of the state of Iowa:

SECTION 1. STATE REGISTRAR OF VITAL STATISTICS. That for the complete and proper registration of births and deaths for legal, sanitary and statistical purposes, the Secretary of the State Board of Health is hereby constituted state registrar of vital statistics, and it shall be his duty to promulgate and enforce all necessary rules and regulations that may be required to carry out the purpose of this Act.

SEC. 2. CERTIFICATES OF DEATH. The undertaker or the person in charge of the funeral of any person dying in Iowa, shall cause a certificate of death to be filled out, with all the personal particulars contained in the standard blanks adopted by the U. S. Census Bureau, and with a statement of cause of death by attending physician, or in his absence, by the health officer or coroner, and shall file it with the state registrar on or before the 5th day of each month for the month preceding and no sexton or superintendent of a cemetery shall permit interment, and no railroad or other transportation company shall permit shipment of the body unaccompanied by such certificate of death.

SEC. 3. STATE REGISTRAR TO FURNISH BLANKS. The state registrar shall furnish blank certificates of death to physicians and undertakers and all proper forms and instructions for the effectual execution of the law.

SEC. 4. CERTIFIED TRANSCRIPTS OF CERTIFICATES OF DEATH. It shall be the duty of the state registrar to furnish to the clerk of the district court of each county on or before the first day of February of each year, certified transcripts of the certificates of death filed with him from

the respective counties as well as similar transcripts of death to the U. S. Census Bureau at Washington and to arrange by counties, bind and deposit in the state historical building at Des Moines the original certificates; and transcripts sent each county shall be bound at the expense of said county and preserved for reference by the clerk of the district court.

SEC. 5. ASSESSOR TO REPORT BIRTHS. It shall be the duty of all assessors at the time of making assessment to obtain and report to the clerk of the district court upon blanks adopted by the state registrar and furnished by the county auditor, such registration of births as occur within their respective districts for the year ending December 31st, immediately preceding.

SEC. 6. RECORD OF MARRIAGES AND DIVORCES, AND BIRTHS. The clerk of the court in each county shall keep a book in which shall be recorded all marriages and divorces occurring within the county together with such data respecting the same as shall be required by the state registrar and shall report to said state registrar on or before the first day of August in each year such data respecting such marriages and divorces for the year ending June 30th, immediately preceding, and the clerk of the district court of each county shall keep a book in which shall be recorded all births occurring in the county as shown by the returns filed in this (his) office by the assessor as provided in the section preceding, and on or before the first day of August in each year shall furnish to the state registrar a report of such births.

SEC. 7. APPROPRIATION. There is hereby appropriated the sum of two thousand five hundred (\$2500) dollars or so much thereof as may be necessary to pay the expense of printing, postage, clerk hire, and such other expenses as may be required, including a sum not to exceed twenty-five (\$25.00) dollars a month to the state registrar in addition to his salary as otherwise authorized. All bills to be itemized, certified to, and approved by the state registrar.

SEC. 8. PENALTY. Any person acting as undertaker, sexton, agent of a transportation company, or other person, violating any of the provisions of this act, shall be fined not less than ten (\$10.00) dollars and not more than one hundred (\$100.00) dollars or be imprisoned not more than sixty (60) days or be subject to both fine and imprisonment at the discretion of the court. It shall be the duty of the prosecuting attorney in each county upon complaint of the state registrar to prosecute in such cases and the state registrar shall endeavor to see that this act is uniformly and officially executed throughout this state.

SEC. 9. REPEALED. Sections twenty-five hundred sixty-six (2566) and twenty-five hundred sixty-seven (2567) of the code and chapter one hundred (100) of the laws of the Thirtieth (30) General Assembly and all other acts and parts of acts in conflict with this act are hereby repealed.

Approved April 10, A. D. 1906.

The State Registrar of Vital Statistics as soon after adjournment as practical had copies of the law and blanks for carrying out its provision put into the hands of undertakers and all persons charged with any duties under the law so that when the law went into effect July 4, 1906, all parties interested were in a position to comply with its requirements.

It will be noticed that in addition to reporting marriages it is made the duty of the clerk of the district court each year at the time he reports marriages to report also the divorces that have been granted during the year together with such data relating thereto as may be required by the State Registrar of Vital Statistics.

This law with slight modifications so far as obtaining data respecting marriages, divorces and deaths are concerned should secure statistics at least approximately complete and reliable. The reports of births as collected by the assessors will be no more correct than under the former law. The data respecting births so far as collected and reported will to that extent be valuable; but for statistical and social purposes, and as affording data for showing comparisons between births and deaths they will be worthless.

No state can have a reliable registration of births in which the physicians to any large extent refuse or neglect to report, as may be required, all births occurring in their practice. The Supreme Court has declared that a statutory requirement of physicians or midwives to report births and deaths is constitutional even though no compensation is provided. This same court has declared that the practice of medicine is a privilege granted by the state upon certain condition, and not a natural right. The law constitutionally declares who may receive, and who may be denied certificates, and upon what condition certificates may be revoked. With that interpretation of the law a failure or neglect to comply with a statute requiring physicians to report births and deaths could and should be one of the specified causes for a revocation of a certificate to practice medicine within the state. Such a penalty would prove much more effective than any fine. The modifications of Chapter 109 Thirty-first General Assembly now in force to be recommended are first, in section 2 line 9 the words "unaccompanied by" should be stricken out and the words "without having been shown" inserted in lieu thereof.

Second, lines five and six strike out the words "as well as similar transcripts of deaths to the U. S. Census Bureau at Washington".

When this provision was inserted in the law it was with the understanding that the Government would pay the expenses of such second transcript. Since then the Secretary has been informed that the Census will obtain a more reliable record of deaths from other sources and hence will not care to pay for our transcripts.

Third, insert in line two, section seven after the word "dollars" the word "annually". Then there should be a specific requirement that no body could be interred without procuring from some authorized

person a burial permit of which a record should be kept by the person issuing it as well as by the undertaker or other person receiving it.

With these changes the present law should, if properly enforced, secure a very reliable record of marriages, divorces, births and deaths.

Quite a number of county officials, lawyers and late members of the late Legislature have suggested—indeed have most positively declared—that there should be some measure presumably a joint resolution passed requiring the State Registrar to furnish to the respective counties of the state a transcript of all the births and deaths reported to the State Board of Health from July 3, 1904, to July 3, 1906 inclusive, such resolution should carry with it an adequate appropriation.

The following are copies of the blanks and circulars sent out by the Secretary, as State Registrar of Vital Statistics. They were sent to every person in the state who is in any way responsible for the enforcement of the provisions of Chapter 109, Laws of the Thirty-first General Assembly:

CERTIFICATE OF DEATH STATE OF IOWA—Department of Vital Statistics.

1. County of (If death occurred in a Hospital or Institution, give the name of the same and number.)

2. Township of (No. Sk. Ward of street and number.)

3. City or Town of (No. Sk. Ward of street and number.)

4. FULL NAME

5. Sex 6. Color

7. Date of Birth (Month) (Day) (Year)

8. Age Years, Months, Days

9. Single, Married, Widowed or Divorced

10. Birthplace (State or Country)

11. Name of Father

12. Birthplace of Father (State or Country)

13. Maiden Name of Mother

14. Birthplace of Mother (State or Country)

15. Occupation

16. The above stated personal particulars are true to the best of my knowledge and belief (Informant)

17. Date of Death (Month) (Day) (Year)

18. I HEREBY CERTIFY, That I attended deceased from until I saw him alive on and that death occurred, on the date stated above, at M. THE CAUSE OF DEATH was as follows:

19. Contributory (Duration) Days

20. (Signed) 21. Address) M. D.

22. SPECIAL INFORMATION only to be filled out by Physicians or Recent Residents Former or Usual Residence How long at Place of Death? Days

23. Where was disease contracted?

24. Place of burial or removal

25. Undertaker

26. Address

WRITE PLAINLY WITH UNFADING INK—THIS IS A PERMANENT RECORD.

N. B.—Every item of information should be carefully supplied. AGE should be stated EXACTLY. PHYSICIANS should state the "Special Information" for persons dying away from home should be given in every instance.

BURIAL PERMIT

Form V. S. E.—100,000-406.

1. County 2. Township 3. City or Town

4. State of Iowa

5. Date of Death

6. Full Name

7. Disease Causing Death

8. Medical attendant (Full name of deceased)

9. Cause of Death

10. Medical Attendant

11. Place of Burial

12. Date of Burial

13. Name of Undertaker

14. Address of Undertaker

15. Signed,

16. Sexton, Superintendent or Grave Digger

17. Dated

18. Address of Undertaker

19. Date of Death

20. Full Name

21. Disease Causing Death

22. Medical attendant (Full name of deceased)

23. Cause of Death

24. Medical Attendant

25. Place of Burial

26. Date of Burial

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28. Address of Undertaker

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31. Dated

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366. Sexton, Superintendent or Grave Digger

367. Dated

368. Address of Undertaker

369. Date of Death

370. Full Name

371. Disease Causing Death

372. Medical attendant (Full name of deceased)

373. Cause of Death

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759

STATE OF IOWA

OFFICE OF STATE REGISTRAR OF VITAL STATISTICS

DES MOINES, June 27, 1906.

To Health Officers and Township Clerks in the State of Iowa:

You are hereby officially notified that your duties as registrar of births and deaths, under chapter 100, laws of the Thirtieth General Assembly, will cease after July 3, 1906, so far as accepting reports of births and deaths occurring in your respective districts, after that date, is concerned. The chapter above referred to becomes null and void after that date. This applies to your deputy and sub-registrars as well.

Do not send in your next, and last report until the tenth (10th) of July, so as to have it embrace any belated returns. It should not only contain the certificates of births and deaths for June but, also, those of the first three days of July.

As soon as your last returns are in the Secretary of State will determine the amount due each of you and will report as soon thereafter as possible the amount thus due to the County Auditor for payment by the Board of Supervisors.

The birth certificates, cards, and V. S. H. blanks left over you may destroy. The death certificates, envelopes and burial permits you will please turn over to the undertakers who will use them until supplied with new ones.

The undersigned wishes, hereby, to extend to you his sincere thanks for your prompt and efficient co-operation in the execution of your duties under the law that is so soon to become obsolete. Your duties were often performed under peculiar difficulties and with but scant encouragement from those entrusted with the duty of assisting you to have as complete reports as possible.

Very respectfully,

J. F. KENNEDY,
State Registrar Vital Statistics.

STATE OF IOWA

OFFICE OF STATE REGISTRAR OF VITAL STATISTICS

DES MOINES, July 2, 1906.

To the County Auditors and Clerks of the District Courts of the State of Iowa:

GENTLEMEN—Your attention is respectfully called to the following provisions of Chapter 109, Laws of the Thirty-first General Assembly, relative to your respective duties:

AUDITORS

SEC. 5. It shall be the duty of all Assessors at the time of making assessment to obtain and report to the Clerk of the District Court upon

blanks adopted by the State Registrar, and furnished by the County Auditor, such registration of births as occur within their respective districts for the year ending December 31st immediately preceding.

The State Registrar hereby adopts and authorizes the use, by Assessors, of the blanks heretofore furnished them by the County Auditor. The data required are few and can be easily obtained.

No record should be made by Assessors of children born in other states during the year and brought into this State. The record for the year ending December 31, 1906, should not contain the names of any children born in Iowa before July 4, 1906. Auditors will please impress these facts upon the Assessors.

CLERKS OF THE DISTRICT COURTS

SEC. 6. The Clerk of the Court in each county shall keep a book in which shall be recorded all marriages and divorces occurring within the county, together with such data respecting the same as shall be required by the State Registrar and shall report to said State Registrar on or before the first day of August in each year, such data respecting such marriages and divorces for the year ending June 30th immediately preceding, and the Clerk of the District Court of each county shall keep a book in which shall be recorded all births occurring within the county as shown by the returns filed in this office by the Assessor, as provided in the section preceding, and on or before the first day of August in each year shall furnish to the State Registrar a report of such births.

The blanks for recording and reporting marriages will remain as they always have been. The State Registrar in a former communication furnished to all Clerks of the District Courts the blank required for reporting data respecting divorces.

Clerks of the District Courts, in addition to sending to the State Board of Health a report of marriages occurring in the year 1905 must send a supplemental report covering the period beginning January 1, 1906, and ending July 3, 1906. After that, under the new law, marriages and divorces will begin with July 1 of one year and end June 30 the next year. The birth reports are for the calendar year—ending December 31, and with the marriages and divorces, will be reported to the State Registrar "on or before the first day of August in each year". The clerks, in making a request for blanks for these yearly reports, will state the number, at least approximately, of marriages, divorces and births, on record in their respective offices so that a sufficient supply may be sent without delay.

The State Registrar will furnish you, on or before the first day of February in each year, on blanks suitable for binding, transcripts of all the deaths reported to him, as having occurred in your county, for the year ending June 30 immediately preceding.

J. F. KENNEDY,
State Registrar Vital Statistics.

STATE OF IOWA

OFFICE OF STATE REGISTRAR OF VITAL STATISTICS

DES MOINES

To undertakers, coroners, superintendents and sextons of Cemeteries:

Chapter 109, laws of the Thirty-first General Assembly, relating to the registration of vital statistics, contains the following provision relative to reporting deaths:

SEC. 2. The undertaker or the person in charge of the funeral of any person dying in Iowa, shall cause a certificate of death to be filled out, with all personal particulars contained in the standard blanks adopted by the U. S. Census Bureau, and with a statement of cause of death by attending physician, or in his absence, by the health officer or coroner, and shall file it with the State Registrar on or before the 5th day of each month for the month preceding and no sexton or superintendent of a cemetery shall permit interment, and no railroad or other transportation company shall permit shipment of the body unaccompanied by such certificate of death."

In addition to the certificate of death forming a part of the yellow or white transportation "paster", the undertaker shipping the body must show the station agent the regular "standard blank" properly filled out, and furnish him with a duplicate of the same to be presented by the person accompanying the remains, to the sexton or cemetery superintendent at the place of interment, and the blank on the yellow and white transportation paster heretofore filled by the local registrar should be filled out by the city or town clerk with the seal of his office. There is nothing in the law to prevent him from charging such fees as the town or city may approve.

When the body is not to be transported the undertaker having filled out the death certificate (V. S. D.) in due form must present it to the sexton or superintendent of the cemetery, or to the superintendent of a state institution having an institutional burying ground, or if in the country to the grave digger or trustees of the graveyard and receive from him, or them, the burial permit prescribed by the State Registrar. These burial permits will be furnished to the undertakers and by them to the sextons or cemetery superintendents.

When the burial is to take place in a country cemetery the undertaker conducting the funeral should fill out the burial permit and have it signed by the grave digger; or if he only furnishes the casket he should require the party purchasing it to furnish him with the required data to enable him to make out the death certificate and he (the one purchasing the casket) should also sign the burial certificate—V. S. E.

These death certificates shown to the cemetery authorities are to be retained by the undertaker until the 5th day of each month when all issued for the full calendar month, immediately preceding, shall be sent to the State Registrar. Deaths of persons shipped into Iowa from other states should not be reported to the State Registrar even though they may have been residents of this state and only temporarily absent.

The State Registrar of Vital Statistics will promptly furnish to all undertakers whether licensed embalmers or not, so far as he can obtain their address, all the blanks necessary for the prompt and proper discharge of their duties.

The following are the penalties for refusing or neglecting to comply with the law:

SEC. 8. Any person acting as undertaker, sexton, agent of a transportation company, or other person, violating any of the provisions of this act shall be fined not less than ten dollars (\$10.00) and not more than one hundred dollars (\$100.00) or be imprisoned not more than sixty (60) days or be subject to both fine and imprisonment at the discretion of the court. It shall be the duty of the prosecuting attorney in each county upon complaint of the State Registrar to prosecute in such cases and the State Registrar shall endeavor to see that this act is uniformly and officially executed throughout this state.

The State has made no provision for paying undertakers any fee for returning the death certificates but the State Registrar will furnish addressed but not stamped envelopes for their use.

This circular is being sent to every undertaker whose address we have. As the State Registrar has no record of the sextons or superintendents of cemeteries or grave yards undertakers will serve their own interests, and save delay by informing such sextons, etc., of their duties under the law, and by supplying them with burial permits (V. S. E.) which may be obtained from the undersigned.

J. F. KENNEDY,
State Registrar Vital Statistics.

OFFICE OF STATE REGISTRAR OF VITAL STATISTICS
DES MOINES, IOWA

.....19....
Hon.....County Attorney,

.....Iowa;

Dear Sir:—Your attention is respectfully called to Chapter 109, Laws 31st G. A., which went into effect July 4th—more particularly to section 8. It will be seen that you as County Attorney are required to assist the State Registrar in the enforcement of the law.

From the returns sent to this office the following facts appear, which indicate that there are undertakers and others in your county who refuse or neglect to comply with the provisions of the law as clearly expressed in section 2:

May I respectfully suggest that, if you would in your official capacity call the attention of the undertakers and sextons of your county, who violate the law, to your duty in regard to this matter through your local papers, there would be prompt and much more general compliance. It might be well to suggest the penalty for non-compliance and that if they failed to procure the certificates of death and report the same as required by that statute that they should do so at once, in order to save costs. I have written to every undertaker in the State, and sent them a copy of the law, and a special circular explaining their duties and I am satisfied that your undertakers are not all complying with the law.

If you will call the attention of your undertakers to this matter—citing them to sections 2 and 8 of the law, and will send me a copy of the paper or papers containing your communication I will be very greatly obliged and I am sure the provisions of the law will be much more generally complied with.

I am very respectfully,

State Registrar of Vital Statistics.

Replies were received from nearly every county attorney in the state expressing his readiness and willingness to co-operate with the State Registrar in securing the enforcement of the law.

MARRIAGES, BIRTHS AND DEATHS

The following table represents by counties the marriages, births and deaths reported to the Secretary by local registrars and by clerks of the respective district courts under chapter 100 for the year 1905 and for the first six months of 1906:

Counties	1905			1906		
	M.	B.	D.	January—June		
	M.	B.	D.	M.	B.	D.
Adair	122	277	133	67	149	61
Adams	103	237	119	63	86	56
Allamakee	116	288	184		117	96
Appanoose	298	466	210	158	198	100
Audubon	43	271	102	54	107	47
Benton	213	536	210	189	233	92
Black Hawk	338	570	317	199	226	153
Boone	251	552	246	133	218	119
Bremer	144	281	136	81	151	79
Buchanan	162	254	130	75	96	81
Buena Vista	124	312	115	64	150	51
Butler	123	380	174	64	124	86
Calhoun	130	243	105	80	85	59
Carrill	179	389	155	94	149	67
Cass	194	365	186	92	103	52
Cedar	132	296	160	54	121	78
Cerro Gordo	214	401	178	114	159	89
Cherokee	152	279	174	67	132	86
Chickasaw	88	195	86	72	84	40
Clarke	94	102	53	55	47	28
Clay	111	272	96	67	131	49
Clayton	209	498	278	91	192	113
Clinch	355	549	454	207	219	209
Crawford	168	411	148	107	123	64
Dallas	143	360	140	109	146	79
Davis	144	249	105	56	114	66
Decatur	188	325	183	87	120	61
Delaware	144	316	164	70	120	70

Counties	1905			1906		
	M.	B.	D.	January	June	D.
Des Moines	402	419	401	206	193	192
Dickinson	56	142	55	31	65	17
Dubuque	488	329	254	299	218	275
Emmet	72	183	77	52	72	28
Fayette	212	444	243	84	139	100
Floyd	147	254	172	60	76	76
Franklin	114	306	105	53	127	50
Fremont	112	261	141	78	111	69
Greene	164	302	122	80	121	40
Grundy	104	234	95	76	111	60
Guthrie	160	287	155	81	115	64
Hamilton	156	278	145	92	179	66
Hancock	84	243	87	45	122	34
Harwin	185	396	223	95	130	86
Harrison	200	439	225	111	177	91
Henry	163	216	197	63	87	85
Howard	110	230	74	52	77	32
Humboldt	91	172	63	60	58	19
Ia	105	208	81	59	97	41
Iowa	147	484	175	76	183	78
Jackson	165	366	199	94	126	53
Jasper	185	576	259	134	232	115
Jefferson	147	270	166	82	126	89
Johnson	181	430	339	132	175	143
Jones	163	299	173	78	95	93
Keokuk	179	361	214	98	149	102
Kossuth	122	440	153	78	223	63
Lee	227	339	378	327	241	239
Linn	638	866	656	317	229	182
Louisa	89	153	108	62	77	31
Lucas	161	318	185	76	122	58
Lyon	99	290	93	52	109	37
Madison	154	272	160	67	95	88
Mahaska	271	429	300	171	164	139
Marion	210	434	180	131	188	113
Marshall	296	496	357	127	169	150
Mills	119	305	148	47	101	66
Mitchell	123	214	122	38	68	62
Monona	171	287	114	92	99	52
Monroe	264	413	184	119	134	88
Montgomery	163	348	180	90	129	92
Muscatine	276	369	348	133	161	154
O'Brien	134	313	88	61	118	52
Osceola	81	243	66	44	95	31
Pago	222	340	294	118	185	143
Palo Alto	104	310	108	55	140	60

Counties	1905			1906		
	M.	B.	D.	January	June	D.
Plymouth	173	400	167	80	182	87
Pocahontas	81	299	118	98	109	40
Polk	1274	1518	1163	660	541	586
Pottawattamie	843	852	506	522	372	272
Poweshiek	166	301	159	65	125	99
Ringgold	113	295	101	72	109	56
Sac	49	324	131	78	138	60
Scott	649	1005	778	365	308	286
Shelby	144	229	96	75	80	28
Sioux	179	531	166	109	207	68
Story	190	552	234	85	225	112
Tama	184	324	179	116	90	76
Taylor	162	390	156	77	119	72
Union	187	264	179	84	102	61
Van Buren	112	348	141	53	107	71
Wanalo	457	603	449	189	251	171
Warren	153	419	185	78	177	93
Washington	174	286	185	75	119	88
Wayne	141	298	178	61	109	74
Webster	235	493	255	145	204	119
Winnebago	92	265	106	46	113	45
Winneshiek	176	287	155	82	141	76
Woodbury	652	1051	674	252	430	470
Worth	69	209	94	35	80	42
Wright	139	272	126	78	125	45
Total	20107	36902	20094	10625	14662	9325

The following summary shows the marriages, births and deaths as reported to the Secretary of the State Board of Health for the biennial periods ending December 31, 1902 and December 31, 1904, for the year 1905, and for the first six months of the year 1906:

Year	Marriages	Births	Deaths
1902	40,730	103,100	26,500
1904	39,556	67,068	24,955
1905	20,107	36,902	20,094
1906 (First Half)	10,625	14,662	9,325

DEATHS OCCURRING IN STATE INSTITUTIONS UNDER THE BOARD OF CONTROL FOR THE PERIOD BEGINNING JUNE 30, 1903 AND ENDING JUNE 30, 1906 *

Institutions	Male	Female	Total
Soldiers' Home, Marshalltown	210	17	227
Soldiers' Orphans' Home, Davenport	2	2	4
School for Blind, Vinton	2	1	3
School for Deaf, Council Bluffs	2	2	4
Institution for Feeble-Minded, Glenwood	64	74	138

Institutions	Male	Female	Total
Industrial School for Boys, Eldora	4	0	4
Industrial School for Girls, Mitchellville	0	3	3
State Hospital (Insane), Mt. Pleasant	124	98	222
State Hospital (Insane), Independence	159	75	234
State Hospital (Insane), Clarinda	154	108	262
State Hospital (Insane), Cherokee	102	49	151
Hospital for Inebriates, Mt. Pleasant	6	3	9
Hospital for Inebriates, Independence	4	0	4
Hospital for Inebriates, Cherokee	1	0	1
Hospital for Inebriates, Knoxville	1	0	1
Penitentiary, Fort Madison	12	0	12
Penitentiary, Anamosa	9	1	10
*Total for all institutions	859	433	1292

DEATHS FROM RAILROAD ACCIDENTS

The deaths from railroad accidents were as follows as shown by report of Railroad Commissioners:

Years	Passengers	Employees	Others	Total
1903	7	100	143	250
1904	12	90	113	215
1905	7	74	109	190
Totals	26	264	365	655

*Does not include deaths outside of institutions—those absent on parole.

CAUSES OF DEATH IN IOWA

The following alleged causes of death have been selected, from those reported without reference to the months or counties in which such deaths occurred.

Diseases.	1903.	1st 6 mo. old law	1904.	last 6 mo. new law.	Total	1905.	1906.	Total
Appendicitis	153	47	36	83	171	71	483	
Cancer	544	158	373	531	904	455	2434	
Diphtheria	87	39	102	141	246	102	676	
Influenza	103	43	25	68	317	117	605	
Measles	99	48	4	52	35	17	203	
Meningitis	105	22	138	160	329	115	709	
Pneumonia	925	454	539	993	1681	974	4573	
Puerperal Sept.	6	0	27	27	44	20	97	
Scarlet Fever	99	62	48	110	108	42	359	
Small Pox	7	0	1	1	8	1	17	
Tuberculosis (lungs)	950	298	452	750	1257	957	3914	
" (other forms)	53	12	96	108	237	122	520	
Typhoid fever	171	60	149	209	295	77	752	
Violence	774	154	291	445	1064	378	2661	
Whooping cough	88	17	22	39	93	41	261	

By way of explanation it may be stated that the deaths from the specified causes for 1903 and for the first half of 1904 were reported under the law requiring births and deaths to be collected by the Assessors and by them reported to the clerk of the district court who in turn reported them to the State Board of Health. Those reported for the last half of 1904, and the year 1905 and the first half of 1906 were reported by physicians and coroners, under chapter 100, to registrars and sub-registrars and by them reported directly to the State Board of Health.

These figures are of no value further than they show that incomplete as were the reports made by physicians they more nearly represent the facts as to deaths from the causes specified, than those collected and reported by the Assessors. This may be more clearly seen by comparing the numbers of such deaths for the full year 1903 with those of the full year 1905. It may even be more strikingly observed by comparing the six months of 1904 with the corresponding period of 1905. What applies to deaths would apply equally to births. Yet, so far as reporting births is concerned, the General Assembly at its last session so modified the law as to again require the Assessors to collect and report to the Clerk of the district court as heretofore. It was a great step backward and a great mistake.

IV

VITAL STATISTICS

TUBERCULOSIS IN IOWA

BY J. F. KENNEDY, M. D., SECRETARY

The state of Iowa through the Thirtieth General Assembly made the first systematic and official effort to determine the extent of Tuberculosis in Iowa. A law was passed—Chapter 162, appropriating one thousand dollars and authorizing the Board of Control of State Institutions "to investigate the extent of tuberculosis in Iowa and the best means of prevention and treatment of the disease and report its findings to the General Assembly". It was further authorized, if deemed advisable, "to place under its immediate observation a number of cases of the disease for the purpose of more fully advising the General Assembly of the actual results of care and treatment"; and to "publish and distribute, at its discretion, such facts as will advise the public regarding the prevention of tuberculosis".

The Board of Control set about its work promptly and very methodically and mailed to over seventy leading experts on tuberculosis in this country and in Europe a letter containing the following questions:

"First. In prosecuting said investigation as to the 'extent of tuberculosis in Iowa' from what sources other than the census reports, reports of vital statistics and information obtainable from practicing physicians and from experts in the treatment of the disease would you expect to obtain information of value?"

"Second. Would it be desirable to ask the physicians of the state how many cases of tuberculosis they have treated during a given period, the age and sex of each patient, the duration of the treatment, the extent and character of prior treatment, if any, the condition of the patient when treatment began (incipient case, advanced case, far advanced or doubtful) methods of treatment, (medical, out of doors, etc.) condition of patients when discharged, (apparently cured, disease arrested, disease improved, disease unimproved, doubtful, died). The effect of treatment on prominent symptoms such as a decrease in the number of bacilli, in expectorations, gain or loss in weight, and in your judgment what other questions should be propounded, and if it is your opinion that some of those above suggested be omitted, what ones would you eliminate?"

"Third. What is your opinion as to the advisability of placing under observation cases of the disease, for the purpose of advising the next General Assembly of the actual results of cure and treatment and if you

would recommend such a course, would you for that purpose recommend the use of tents or of temporary wooden structures, and would there be any objection to conducting such a camp within a reasonable distance from an existing State Hospital for the Insane?"

"Fourth. In your judgment can the results of cure and treatment be as well ascertained and demonstrated with tubercular patients who may be insane as with tubercular patients who are not insane?"

"Fifth. What in your opinion are the indispensable requisites for the location of such a camp, as well as for the location of a permanent institution for the treatment of tubercular patients?"

"Sixth. What, in your opinion, are the desirable though not indispensable requisites for the location of such a camp or permanent institution?"

"Seventh. Kindly give us fully any other information which will, in your opinion, be of value to us in the proper prosecution of this work."

There were sixty replies to these letters and the Board in its report to the Thirty-first General Assembly presented the following summary of the replies:—

A majority of them favored the plan indicated in questions one and two. Some proposed adding other questions; a few deemed statistics so gathered of little value, others would confine the inquiry for information to a limited portion of the state, and still others thought that known facts in other states were a sufficient guide to follow. A majority opposed placing cases under observation the objections being various, including insufficient time in which to make the experiment and too small an appropriation.

In the event that patients were placed under observation the physicians were about equally divided in opinion as to the use of tents or wooden structures for the purpose of housing patients.

A large majority saw no objection to locating such a camp a reasonable distance from a hospital for the insane.

The experts were, as might be expected, practically unanimous in the opinion that as good results could not be obtained with insane tubercular patients as with sane patients. All advised the following conditions as desirable for the location of either a temporary or permanent hospital for the treatment of tubercular patients, viz.: pure air, a considerable elevation, a reasonable distance from a city or town, good railroad facilities, good drainage, timber protection, southern exposure, etc.

Very few advised a high altitude of from 1,500 to several thousand feet as desirable.

The greater number favored a moderate elevation and deemed out-door care and proper treatment more important than altitude.

In view of the information thus received, and its great value, coming from men who had made a study of this disease and its treatment, the Board concluded that it was not wise to attempt to place cases under observation, that the time was too short and the funds available insufficient to carry out all of the act.

In addition to the letter above referred to as having been sent to experts on tuberculosis, the Board of Control sent to every physician in Iowa a blank calling for the following information:—

The number of persons treated for tuberculosis by each or known by each to have had said disease during the year ending June 30, 1904, the name, age, sex, social state, color, occupation, residence and nativity of each of said persons so treated or known, also a statement as to whether they were afflicted with pulmonary tuberculosis or with tuberculosis of some other organ or part of the body. During the month of September, 1904, the blanks were mailed to all of the physicians in Iowa, 3,532 in number, and up to July 1, 1905, replies had been received from 2,436 physicians, of whom 1,039 reported no cases and 1,397 reported one or more cases each. Of those reporting no cases, some had retired from the practice, and others had removed from the state. These 1,397 physicians reported 4,569 cases as existing during the period heretofore mentioned.

As a result of these letters the Board of Control reported the following data:

NO. 1. GENERAL

Blank forms sent to physicians.....	3,532
Number of physicians responding	2,436
Number of those reporting cases.....	1,397
Number of those reporting no cases.....	1,039
Number of cases reported.....	4,569

NO. 2. COLOR

White	4,481
Black.....	87
Color not given.....	1
Total.....	4,569

NO. 3. CHARACTER OF THE DISEASE

Pulmonary.....	3,725
Tuberculosis of other organs or parts of the body.....	844
Total.....	4,569

NO. 4. SEX

Males.....	1,887
Females.....	2,611
Sex not given.....	71
Total.....	4,569

NO. 5. SOCIAL STATE

Married.....	2,231
Single.....	2,043
Widowers.....	98
Widows.....	161
Not stated.....	36
Total.....	4,569

NO. 6. AGE PERIODS

One year and under.....	43
Over one year and including ten years.....	189
Over ten years and including twenty years.....	685
Over twenty years and including thirty years.....	1,536
Over thirty years and including forty years.....	1,073
Over forty years and including fifty years.....	435
Over fifty years and including sixty years.....	266
Over sixty years and including seventy years.....	161
Over seventy years and including eighty years.....	50
Over eighty years of age.....	5
No age given.....	71
Total.....	4,569

NO. 7. NATIVITY

United States.....	3,002
Africans.....	5
Austrians.....	2
Canadians.....	5
Czechs.....	96
Danes.....	70
English.....	42
French.....	10
Germans.....	460
Greek.....	1
Hollanders.....	15
Irish.....	246
Jews.....	7
Norwegians.....	286
Poles.....	4
Scandinavians.....	41
Scotch.....	19
Spanish.....	2
Swedes.....	137
Swiss.....	6
Syrians.....	2
Welsh.....	8
Italian.....	1
Unknown.....	102
Total.....	4,569

TABLE NO. 8—OCCUPATIONS

Agents.....	4	Bakers.....	2
Agent, U. S.....	1	Barbers.....	17
Artist.....	1	Bankers.....	6
Attorneys.....	5	Bank Clerk.....	1
Athlete.....	5	Bank Cashiers.....	3

OCCUPATIONS—Continued

Bar Tenders.....	19	Expressmen.....	3
Bell Boy.....	1	Express Agent.....	1
Blacksmiths.....	12	Factory Girls.....	3
Blacksmith, Retired.....	1	Factory, Overall, employee.....	1
Bookkeepers.....	24	Farmers.....	634
Bookbinder.....	1	Farmers, Retired.....	23
Bottling Works.....	1	Farmers' Wives.....	100
Broommakers.....	2	Farmers' Sons.....	7
Brewer.....	1	Farmers' Daughters.....	51
Brakemen.....	2	Farm Hands.....	25
Bridge Engineers.....	2	Firemen.....	5
Butchers.....	6	Firemen, Locomotive.....	4
Buttermaker.....	1	Florist.....	1
Brickmaker.....	1	Floor Polisher.....	1
Button Cutters.....	2	Foundry Worker.....	1
Cabinetmaker.....	1	Freight Handler.....	1
Carpenters.....	29	Furniture Dealers.....	2
Carpetweaver.....	1	Gardeners.....	5
Cigarmakers.....	9	Glove Cutters.....	2
City Marshal.....	1	Gold Digger.....	1
City Scavenger.....	1	Grain Dealers.....	2
Clerks.....	90	Grocers.....	4
Clerks in P. O.....	1	Grocers, Wholesale.....	2
Clerks, Dry Goods.....	3	Guard in Penitentiary.....	1
Clerks, Postal.....	4	Harness Makers.....	2
Clergymen.....	9	Hair Dresser.....	1
Clergymen's Wives.....	2	Horse Buyers.....	5
Clothier.....	1	Hotel Keepers.....	6
Coachman.....	1	Housewives.....	1101
Coat Cleaner.....	1	Housekeepers.....	252
Coffee Roaster.....	1	Houseworkers.....	5
Compositors.....	23	Insurance Agents.....	11
Conductors.....	7	Janitors.....	3
Contractors.....	3	Jewelers.....	6
Cooks.....	7	Jockeys.....	2
County Recorder.....	1	Laborers.....	253
Creamery Supt.....	1	Land Agent.....	1
Dentists.....	8	Launderers.....	2
Domestics.....	239	Lineman.....	1
Draymen.....	2	Liveryman.....	1
Dressmakers.....	27	Lumberman.....	1
Druggists.....	11	Machinists.....	9
Drug Clerks.....	2	Mail Carriers.....	6
Editors.....	4	Manager Pkg. Co.....	1
Electricians.....	7	Maple Sugar Worker.....	1
Engineers.....	5	Marble Cutters.....	3
Engineer, Ship.....	1	Masons.....	5

OCCUPATIONS-Continued

Millers	3	Restaurant Keepers	3
Milliners	14	Saddler	1
Miners	21	Salesmen	11
Motormen	2	Saloon Keepers	5
Moulders	2	Seamstresses	29
Musicians	5	Section Men	2
Music Teachers	14	Sheriff	1
Night Watchman	1	Stock Buyer	1
None	620	Shoemakers	4
Nurses	6	Speculator	1
Oculist	1	Station Agent	1
Painters	23	Stenographers	17
Peddlers	3	Stone Mason	1
Photographer	1	Students	266
Physicians	10	Tailors	6
Pharmacist, Retired	1	Teachers	101
Piano Tuner	1	Teamsters	7
Plasterers	3	Telephone Operators	13
Plumber	1	Telegraphers	7
Politician	1	Telegraph Construction	1
Porters	2	Tinners	4
Postmasters	2	Trader	1
Railway Employees	6	Travelling Salesmen	8
Railway Laborers	6	Undertakers	2
Ranchman	1	Veterinary Surgeons	3
Mason's Daughter	1	Vicelist	1
Merchants	43	Vocalist	1
Mechanics	9	Wagon Maker	1
Mill Worker	1	Walters	6
Real Estate Dealers	3	Wood Workers	2
Retired	17		

Total4,569

There were other interesting statistics showing by counties the sex and age, nativity and occupation which we are not able to reproduce.

The following simple diagrams are found in the report and illustrate more eloquently than mere numbers the relative conditions named:

DIAGRAM NO. I-CHARACTER OF THE DISEASE

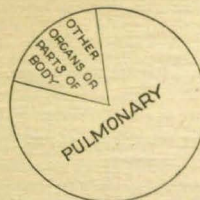


DIAGRAM NO. II-SEX

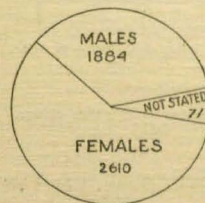


DIAGRAM NO. III-SOCIAL STATE

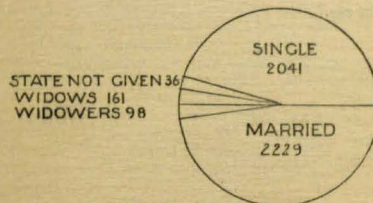
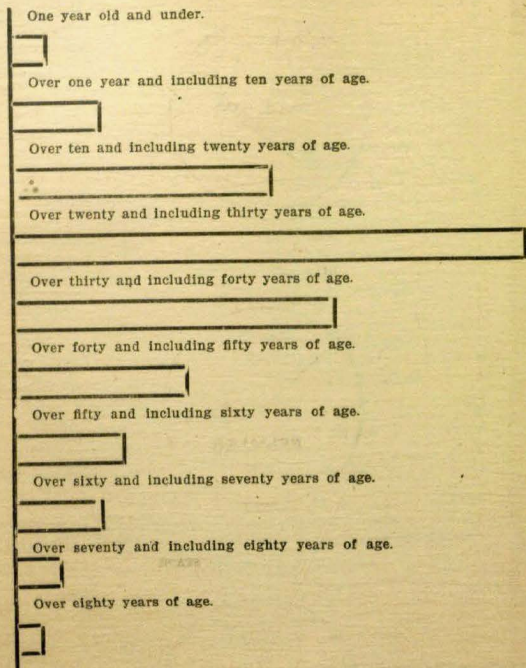


DIAGRAM NO. IV - AGE PERIODS



The report presents the following most excellent statement of the cause and prevention and treatment of tuberculosis, showing the pains taken and extensive research made by the Board to cover as concisely as possible all that was thought necessary to present:-

Now that the cause of tuberculosis is known, the measures which should be adopted to prevent its spread are well understood by those conversant with the proper treatment of the disease.

As inhalation is the most common means of acquiring the disease, if the bacillus tuberculosis can be destroyed before entering the human system, the question of prevention will be largely solved.

Hence every reasonable measure calculated to prevent the inhalation of this germ should be adopted and enforced. These embrace the prevention of expectoration on sidewalks and in certain public places, the free examination of sputa, proper disinfection, sanitary living, etc. More has been done in the cities of New York and Boston along these lines than elsewhere in this country.

In Iowa many of our cities and towns have ordinances preventing spitting in public places and while such ordinances are rarely enforced, still marked improvement in conditions is noticeable in such places.

Provision has been made by the state for a laboratory at the University at Iowa City for the examination of sputa, free of charge.

The Board of Health has adopted a rule requiring all physicians to report cases of tuberculosis so that they may be under observation. The Board of Health through articles published in its Bulletin and otherwise has done all in its power to aid in extending information to the public regarding the steps necessary to prevent the spread of the disease.

The Board of Control through many articles published in the "Bulletin of Iowa Institutions", some of which have been re-printed and widely disseminated throughout the state, and the state and many county and local medical societies and the State Association of Charities and Correction, have been diligent in promoting the work of educating the people along proper lines of prevention and cure of the disease. If the people generally would read the literature upon this subject which is available for them, and follow the advice given therein, the ravages of this disease would be greatly curtailed.

Education and improved sanitary conditions have aided to a considerable extent in the improvement of conditions which are calculated to reduce the mortality from this disease, but as is well said in the report of the New Hampshire Commission, "But the means, though simple in themselves, require a certain degree of intelligence, a persistence of purpose and a constant care of details, that cannot be obtained in a majority of cases if left to themselves".

Constant education of the people as to the important sanitary conditions of dwellings and shops, the proper ventilation of all buildings, public and private, the perfection of hygienic conditions among all of our people, will contribute much to prevent the spread of tuberculosis.

Yet it will still be necessary to afford means of treatment of the disease which may be available, especially to those who by reason of the disease being in its incipency, may be expected to receive the greatest benefit.

While it is well understood that there is as yet no specific for tuberculosis, still in the past many different methods of treatment for the disease have been used. The cod liver oil treatment was common. Dr. Hericourt, of France, reports thirty-five cases treated by the By Zomol, or raw beef method, all of whom recovered. The Crotle system was also used in France. Powerful antiseptics were forced by electricity into the lungs or affected organs. Of 4,600 patients thus treated, 3,000 were said to have been cured.

Another method of cure was the use of naso-oral antiseptic respirator when by volatile antiseptics such as creosote and carbolic acid or creosote only were drawn into the lungs with each respiration.

Alluring as were the claims of the promoters of the various cures for tuberculosis, none met the expectations of the afflicted and it remained to try the simplest remedy of all, an out-of-door life with proper surroundings and a suitable diet, all under proper medical supervision.

In 1854 some of the soldiers in the Austrian army were treated in tents instead of in hospitals and the result showed that the most severe maladies ran their course more mildly in the fresh air.

Tholozan tells us that at Sevastopol in the Crimean war in spite of bad nourishment, living in tents, in rain and snows, out of 1,200 sick scarcely any had consumption.

Bodington in his book recommended the establishment of sanatoria for the treatment of consumptives.

Dr. Thomas, of Chicago, speaking with reference to the open air treatment, says: "Incipient tuberculosis is one of the diseases most easily cured. It is fair to estimate that under proper treatment in sanatoria 50 to 75 per cent of the consumptive patients in the earlier stages would be cured."

Gabrilowitch reports as follows regarding 1,000 consumptives treated in Russian Finland: 122 were in the first stage, 720 in the second stage and 158 in the third stage, being 72 per cent in an advanced stage on admission. On discharge 253 were cured, 472 improved, 137 classed as without result, and 88 died, making 72½ per cent cured or improved and 25.3 per cent cured.

In the first report of the Henry Phipps Institute of Philadelphia, Pa., the results of treatment in both the hospital and dispensary show that of the cases treated, 537 were improved, 583 unimproved, 153 died and 884 results not recorded.

Below we give from the latest reports the results in the leading sanatoria for the treatment of tuberculosis, viz.:

FEDERAL SANATORIUM AT FT. STANTON, NEW MEXICO

They receive cases in all stages of the disease, and from the opening in 1899 until April, 1903, the results were as follows:

Died	29.9%
Unimproved	2.8%
Improved	54.2%
Apparently recovered	18.1%

Of those in the first stage 50% recovered and 37.5% improved.
Of those in the second stage 5.6% recovered and 54.0% improved.
Of those in the third stage 7.3% improved and 33.0% died.

MASSACHUSETTS STATE SANATORIUM, RUTLAND, MASS.

Number of cases reported on, 576.

Arrested and apparently cured	258 or 44.8%
Improved	275 or 47.7%
Not improved (including 4 deaths) ..	43 or 7.4%

Of the incipient cases 75.8% were arrested or apparently cured and the percentage of incipient cases arrested or apparently cured since the institution was first opened is as follows:

1898-9	64.60%
1899-1900	72.90%
1900-1	73.00%
1901-2	72.00%
1902-3	72.60%
1903-4	75.8%

ADIRONDACK COTTAGE SANATORIUM, SARANAC LAKE, N. Y.

Results of treatment for year ending Nov. 4, 1904.

Patients treated	185
Discharged apparently cured	41 or 22%
Discharged with disease arrested	108 or 58%
Discharged improved	23 or 12%
Discharged unimproved	11 or 6%
Non-tuberculosis	1 or 1%
Died	1 or 1%

LOOMIS SANATORIUM, LIBERTY, N. Y.

Results of treatment for year ending November 1, 1904, of patients in all stages of the disease:

Number of patients treated	167
Apparently cured	27 or 16.17%
Activity arrested	44 or 26.35%
Improved	43 or 25.75%
Unimproved	34 or 20.35%
Died	19 or 11.38%

Of the early cases with mild symptoms:

16 or 61.54% were apparently cured.
7 or 26.92% activity arrested.
2 or 7.69% improved.
1 or 3.85% unimproved.
Died—None.

SHARON SANATORIUM, SHARON, MASS.

Number of patients treated for year ending March 1, 1904—52.

Disease arrested in 32 cases of 61%.
Disease improved in 18 cases or 34%.
Disease not improved in 2 cases or 4%.

Of the arrested cases 5 were advanced cases.

Of the improved cases 13 were advanced cases.

Of the not improved cases 2 were advanced cases.

ALTITUDE

Formerly it was thought that a high altitude was one of the requisites for the successful treatment of tuberculosis and even yet there are a few specialists who insist on a great elevation as a prima requisite for the location of an institution for that purpose. Thus, Dr. Carrington, surgeon in charge of the Government Sanatorium at Fort Stanton, N. M., says it should be "from 3,000 to 6,000 feet" in elevation.

Of the many experts consulted by this Board, few advocated an elevation of from 1,000 to 1,500 feet, one says from 600 to 800 feet, one 400 to 1,000 feet; one, 2,000 feet; two, 100 feet; four, "a considerable altitude"; three "all the altitude you can get", and eleven advised "a moderate elevation".

Dr. Bowditch, of Boston, an eminent specialist along these lines says, "anywhere from 250 to 1,500 feet would be suitable" * * * "Experience at Sharon, Mass., Sanatorium, which is only about 250 feet, has taught me that the supervision of the patients at the critical time is the chief point rather than the difference of a few hundred feet in altitude."

Dr. King says that sanatoria situated in high altitudes i. e. from 5,000 to 10,000 feet are far more limited in the scope of usefulness than is the case with those at more moderate elevations, and he recommends a location not less than 1,000 feet above tide water.

The Commission appointed by the Governor of New Hampshire to report upon the question of a state sanatorium for the treatment of consumptives, advise a location of not less than 500 feet above sea level.

There is no trouble in Iowa in finding a great many places with sufficient altitude for the proper treatment of this disease.

CLIMATE

Dr. James Third, of Canada, says: "The truth is, with few exceptions, the patient should be treated in the locality in which he expects to spend the balance of his days".

The Ohio Commission in its report says: "Climate, while exerting some influence in the cure of tuberculosis, is not an essential factor".

The New Hampshire Commission in its report says: "The opinion, too frequently entertained in the past that patients must go to Florida, Colorado or California in order to be restored to health has been shown to be fallacious and in some instances a marked disadvantage as compared with results of sanatorium treatment in the climate in which the patient has lived and is to reside afterwards". Dr. Flick says: "Consumption can be cured in any climate. All that is necessary is life in the open air, proper food, well regulated and carefully disciplined conduct and in more advanced cases, properly directed rest and exercise. People who can command these things can be cured in their homes. People who cannot command them should be treated in sanatoria. Most people can be treated better in sanatoria than in their homes."

Dr. Kime, of the Boulder Lodge Sanatorium, at Fort Dodge, Iowa, says: "There is no marked difference in the number of recoveries whether in Norway, the British Isles, in Germany, France or Italy. Crowding to our own side of the Atlantic, we find like results in Massachusetts near

the sea level, in the Adirondacks of New York, in Pennsylvania, in the Valley of the Mississippi, in the Rocky Mountain region and in the great Southwest. Equally good results are obtained on the mountain top or at the sea level, in the dry and arid regions or on board a vessel in the open sea. As between the invigorating breezes of the north and the depressing heat of the south, the former are much to be preferred. In New York or Massachusetts, in Wisconsin or in Iowa, patients under proper supervision will do infinitely better and more of them will get well than if they seek some fabled clime in some far off land.

The benefits to be derived from a change of climate are nothing to be compared to the hardships sustained, to the wide separation from home and friends and the weary waitings for the return to health".

Some have thought that the climate of Iowa was too severe for the successful treatment of this disease. This is a mistake. The more than twenty years of successful experience in the treatment of tuberculosis at the Adirondack Cottage Sanatorium at Saranac Lake, N. Y., where it is frequently in the winter season from 20 to 30 degrees below zero, the like experience at Canadian Sanatoriums and the general experience that recoveries are more certain and rapid in cold weather than in warm weather, all clearly indicate that the disease can be as successfully treated in Iowa as in Canada, New York, Pennsylvania or other states.

Dr. Harold N. Moyer, of Chicago, says: "It (out-of-door treatment) will show them (the members of the legislature) that tuberculosis can be successfully managed in Iowa and that the recovery rate under proper conditions will be equal to if not better than those who are sent to a supposedly favorable climate."

Dr. Norman Bridges, of Los Angeles, California, says: "You can, within the borders of your own state, produce conditions for the recovery of tuberculosis far better than to send your poor patients to distant climates at the risk of home, sickness and lack of care and good food."

Commodore Peary expressed the conviction based upon his experience in the arctic regions, that consumption sanatoria within the arctic circle will become recognized places for the sure restoration of health.

The following appears in the report relative to sanatoria:

THE SANATORIA MOVEMENT

From a very interesting article by Dr. Third on "Tuberculosis, a Curable Disease, a Survey," published in *Queens Medical Quarterly* in April, 1904, we glean many important facts which led up to the development of the sanatoria idea of the treatment of this disease.

At the close of the Trojan war, sanatoria were erected "on hill sides, near thermal springs or fountains, and among groves."

Galen in the Roman period, considered impure air an important etiological factor of pulmonary tuberculosis, recommending high altitudes and suggested the possibility of the disease being contagious. The Arabic School of the 10th century taught that tuberculosis was contagious and followed Galen in recommending mountain climates. * * *

Jacob Sylvius, in the earlier part of the 16th century called attention to the great ravages of consumption."

Regarding such sanatorias in other lands, Dr. J. H. Lowman in his work "The Conflict with Tuberculosis" says:

In England, the home of sanitary science there have been sanatoria for over a century. The one at Hargate dates from 1759. There are now in the British Isles many sanatoria for the cure of consumption, notably at Brompton, Ventnor, Cotwold, and near the Norfolk coast. Early in 1902, Sir Ernest Cassell gave King Edward the sum of \$1,000,000 to be used for whatever charitable utilitarian purpose he should select. The King decided to devote the larger portion of the gift to the creation of a sanatorium for tubercular patients. A design for the same has been submitted by Dr. Arthur Latham, of London, having two main objects in view: First, to develop the resistance of the body to the bacillus by means of fresh air and a systematic regimen. Second, to avoid dust and all possibility of infected material. This sanatorium is designed for one hundred patients.

"In France, there are insulated sanatoria, but the united effort has been directed toward combating the disease in childhood. At Berck-sur-mer, Villers and Ormesson, there are large and complete institutions that care for hundreds of tubercular children annually. Some of the children are kept for eighteen months and the half are cured.

"Desultory efforts are made in Austria and Holland, and institutions are reported from Scandinavia and Russia. In Germany there are more institutions, greater effort, better organization, and more definite results.

"From small beginnings, the private sanatoria have grown and increased until this summer, when twenty were reported from Germany and ten from Switzerland.

"But the private institutions are only the beginning of the movement against tuberculous. One's interest soon passes from them to the folks-sanatoria.

"In 1896 the central committee for the erection of folks-sanatoria for the cure of tuberculosis came into being. The empress is the protectress of this committee, the chancellor of the empire, Von Bulow, is the honorary president, and General Von Panwitz is the secretary. Its membership is composed of 800 of the most distinguished citizens.

"The central committee began the erection of folks-sanatoria or, as the Germans aptly call them, Volkshelilstätte (people curing stations). The committee has prosecuted this work so earnestly that there are now fifty-seven folks-sanatoria in full operation, and twenty-six in progress of building. Near 11,000 tubercular patients are now in sanatoria in Germany. Some institutions have been built by the Society of the Red Cross, some by railroad corporations, some by life insurance companies, some by individuals and associations organized for that special purpose, and some by the Agricultural Insurance Society.

"Only first stage tuberculosis cases are desired in the sanatoria. Second stage cases are rarely cured, and third stage cases with cavities and hectic fever, are never cured. The folks-sanatoria are places for curing the disease. Many patients, however, in the second and third stage gain admission and are often benefited."

SANATORIA VS. HOME TREATMENT

We have endeavored to show the general prevalence of tuberculosis, its disastrous effects and the great necessity for the prompt use of every means at our command to prevent its spread and to curtail the number of its victims.

It may well be asked cannot this whole matter be regulated to treatment in the homes of the afflicted? Here is a malady which is responsible for every seventh death, the mortality is appalling and to substantially reduce it will require every agency and means known to man. Education regarding its prevention, home treatment, private, corporate and state institutions for the treatment and cure of its victims, all of these means must be made available if we would successfully stem the onward march of this grim monster. In this great work the demand for help will always exceed the means furnished.

True, all the afflicted cannot avail themselves of private or state sanatoria treatment, but the time is not likely to come when every facility, private, corporate or state, will not be taxed to its utmost to accommodate those who need and desire treatment.

The advantages of sanatoria over home treatment, whenever the latter can be had, is well stated in the report of the New Hampshire Commission thus:—"The strict regulations necessary in most cases are impossible in the home. The patient cannot be under constant medical supervision. His habits, diet, exercise, etc., cannot be regulated daily and hourly.

At a sanatorium every detail essential to the most successful and scientific treatment is in force under the discipline impossible to inaugurate and maintain in the home. The environment of the home, even under the best circumstances is not so favorable as that of an institution created especially for the treatment of the disease. By removing the patient to a sanatorium in the incipient stages of the disease the infection of others is avoided.

(It is not to be inferred that successful treatment at home is impossible, for such is not the case, but simply that a sanatorium offers far greater assurances of successful results than any other place.)"

Every patient in the sanatorium receives constant personal attention, his condition is noted and upon these examinations and observations are based the treatment which is given. Again the number cured or benefited by treatment is not the only benefit arising from sanatoria treatment. By reason of the placing of the patients in a sanatorium others are protected from the spread of the disease and the educational influence exerted in the community by those who return from the sanatorium cured is valuable.

Regarding this, Dr. Knopf says: "In the villages where the two largest German Sanatoria are situated, Gorbisdorf and Falkenstein, the mortality from tuberculosis has actually decreased among the village people, being now one-third less than before the establishment of these institutions. This no doubt, is due to the example set by the inmates of the sanatoria, and it is also the best proof that well conducted sanatoria for consumptives are not centers of infection, but on the contrary, places where one is safest from contagion."

In speaking of this educational feature, Dr. E. Smith of Minneapolis, Minn., said: "The sanatorium at Rutland is the very best means the state can furnish to educate the masses. After from five to eight months sanatorium treatment these patients go home and carry out the treatment learned during their sojourn. They are careful about spitting on the floor, and the use of dishes, bedding, etc. They teach their families to dread and to be careful about the disease and their example and influence is felt in their immediate neighborhood, for these patients know the value and necessity of fresh air (and plenty of it), sunshine, and clean homes. Any one known to expectorate on the ground or floors or sidewalks is immediately dismissed from these sanatoria because they are taught that consumption is contagious and they are endangering others."

The writer of this report having in 1904 personally visited and inspected the Massachusetts state sanatorium at Rutland, the New York Institution at Ray Brook and the Adirondack Cottage sanatorium at Saranac Lake, can unhesitatingly interpose what Dr. Smith says.

Treatment of tubercular patients in sanatoria is recommended by the most eminent specialists in the world. Space will not permit setting out in detail their opinions.

Dr. Bowditch of Boston, says: "As some of you may know, my chief study in the past ten or twelve years has been the sanatorium treatment of consumption. Having observed the methods of Brehmer, the father of the idea of sanatorium treatment of phthisis in Gorbardsdorf, later of his pupils, Detweiler in Falkenstein, or Trudeau at Saranac with a personal experience of ten years at the small sanatorium at Sharon and in the last two and a half years at the large state sanatorium at Rutland, Massachusetts, I have become more and more fully convinced that strict medical supervision at a critical period of the disease is productive of far better and surer results than any other method that I know."

"I am convinced beyond a shadow of a doubt that the results obtained at Sharon and Rutland would have been impossible by any methods that I have hitherto employed at the patients' homes or by ordinary office treatment. The fact that patients are told what to do and what not to do in the matter of exercise, diet, and other hygienic measures at a time when error through ignorance may be fatal is a most weighty argument in favor of sanatorium treatment and the discipline it involves. The old arguments, now happily falling into disuse, against the depressing effects of institution life, and similar objections, have in my experience proved in the great majority of cases mere shadows of the imagination and amount to nothing when compared to the advantages to be obtained by close supervision. The philosophical attitude, even the gaiety of the majority of the patients in every institution of this nature, is something I have always been struck with, and such, without exception, has been the experience of others who work in similar lines to my own."

Elsewhere we have shown the results as to cures from this disease in several of the leading sanatoria in this country and the figures there given constitute a more forcible argument in favor of sanatorium treatment than anything we could say.

RESULTS OF INVESTIGATIONS

The statute directs us to investigate "the extent of tuberculosis in Iowa, and the best means of prevention and treatment of the disease and report its findings to the next General Assembly". The full performance of the duty enjoined involved a study of the disease, its characteristics, extent of fatality and the means of prevention and treatment adopted and practiced in other states and countries.

We have endeavored to furnish in this report such facts as would advise the General Assembly as to conditions now existing in this state regarding the extent of the disease and what is regarded everywhere as the best means of prevention and treatment.

FINDINGS

First, that there are at least 7,000 and probably 7,500 cases of tuberculosis in Iowa.

Second, that the best means of prevention of the disease are:

A. A strict enforcement of the existing rule of the Board of Health which requires a prompt report to be made by physicians of all cases of tuberculosis.

B. State Legislation with proper penalties prohibiting expectoration in and about all churches, public halls, in all public conveyances and on sidewalks.

C. The education of the people by dissemination of proper literature informing them of the dangerous character of the disease, of the measures which should be taken for its treatment and to prevent its spread and to protect themselves and others from its ravages.

D. Instruction in the public schools of the state regarding the disease, its prevention and treatment.

E. The removal of tubercular cases in the earliest stages from the home to a public or private sanatorium when practicable, to prevent the spread of the disease.

F. Legislation authorizing and encouraging municipalities in the establishment and maintenance of local hospitals for the treatment of tubercular cases.

Third, that the best means of treatment of the disease are: In sanatoria, public or private, where patients can lead a regular life under the most favorable conditions as to diet, clothing, exercise and medical and other care under the direction of skilled physicians and capable nurses and where the surroundings are calculated to promote recovery.

IOWA ASSOCIATION FOR THE STUDY AND PREVENTION OF TUBERCULOSIS

In addition to the work done by the State Board of Control of State Institutions there was organized in Des Moines July, 1905, the "Iowa Association for the Study and Prevention of Tuberculosis" with the Honorable William Larrabee, Clermont, President; Dr. R. E. Conitt, Sioux City, 1st Vice President; A. L. Urick, Des Moines, 2nd Vice President; and Dr. E. Luther Stevens, Des Moines, Secretary-Treasurer.

The Association is Auxilliary to a National Association for the same purpose organized in Washington, D. C., the year before. This Association has sent out a large amount of literature pertaining to tuberculosis—its cause, and prevention. The following unique and very practical leaflet was sent out in large quantities and was reprinted in the Iowa Health Bulletin which has a circulation of over 10,000 copies monthly:-

**YOU CAN SAVE YOURSELF AND FAMILY FROM TUBERCULOSIS—
(CONSUMPTION)—IF YOU KNOW HOW**

Did You Know that 2,000 Iowans Die Every Year from Tuberculosis?
that on an Average Every One Dying Infects Four Others,
One Fatally? and that 8,000 Persons in Iowa Now Have
the Disease?

THE CAUSE OF TUBERCULOSIS is a GERM—a little vegetable growth which occurs by the millions in the sputum (spit) of the persons having the disease. If a consumptive immediately burns or disinfects his sputum he will not give the disease to any one else. "No Spit, No Consumption," says the Illinois State Board of Health. (If You are careless with your sputum, the CONSUMPTIVE will probably be careless with his, too.)

THIS GERM loves to be indoors. It multiplies rapidly in the body of the person who lives, or sleeps, or works indoors where ventilation is poor. Cleanliness and sunlight and fresh air are destructive to the life of the germ. It perishes before open windows.

(DO NOT BREATHE air that you or other persons have already used.
Use bad food rather than bad air.)

Any one who keeps himself in good bodily health will nearly always resist this disease.

WHO ARE LIABLE TO THE DISEASE? Any one weakened by other disease such as grip, pleurisy, pneumonia, typhoid fever, and measles, is in just the condition in which the germ of tuberculosis can multiply the fastest because the bodily health or power to resist disease is lowered.

Any one who habitually or excessively uses alcohol lessens his power to resist tuberculosis.

Any one who is constantly overworked, or poorly fed, or who lives or sleeps or works in a poorly ventilated room, weakens his resisting power and easily becomes a subject of tuberculosis. (This is one reason why so many printers and cigar makers have tuberculosis.)

CAN TUBERCULOSIS BE CURED? Yes, emphatically Yes, if proper treatment is begun early. Even patients in advanced stages, if rightly treated, often partly recover and are able to work and enjoy life for years. Every patient with tuberculosis, no matter how far advanced the disease may be, can be so treated that he will not give the disease to those about him.

THE CHIEF CONDITIONS NECESSARY FOR SUCCESSFUL TREATMENT ARE:

1. Early recognition of the disease.
2. Fresh air in the greatest abundance, day and night.
3. Plenty of the most nutritious food.

4. Absolute rest in bed until fever has ceased.
5. Carefully regulated exercise.
6. All of the above must be used under close observation of a competent physician who will see to it that everything is done for the individual patient that will increase his power to resist the disease.

While medicine may relieve some of the symptoms for the time being, there is no drug that will cure the disease.

SANATORIUM NEEDED

The treatment of tuberculosis is necessarily expensive and it takes a long time—from three months to a year even in early cases—so it is very difficult to successfully treat a case in the home. Many states are providing sanatoria for the treatment of tuberculosis, and the next General Assembly of Iowa will be asked to make provision for such an institution.

SYMPTOMS OF DISEASE THAT SHOULD LEAD YOU TO SECURE CAREFUL EXAMINATION BY YOUR PHYSICIAN:

1. A cough that persists for a few weeks and resists the usual remedies.
2. A constant tired feeling or "run-down" condition.
3. Loss of weight and strength not otherwise accounted for.
4. Any bleeding from the throat or lungs.
5. The occurrence of frequent colds.

This bulletin is issued by IOWA ASSOCIATION FOR THE STUDY AND PREVENTION OF TUBERCULOSIS, E. Luther Stevens, M. D., Secretary, 605 Citizens Nat'l Bank Bldg., Des Moines. Should you wish further information on the subject, address the secretary, enclosing stamp for reply.

HYGIENE AND THE SANITARY ARTS*

BY COL. CHARLES FRANCIS C. E. DAVENPORT, MEMBER STATE BOARD OF HEALTH

Sanitary science, or the Science of Health, has been generally held to be the same thing as Hygiene. There is, however, this distinction, that while the Sanitary Science seeks only the prevention of premature death, Hygiene, in its fullest sense, goes further, and endeavors to elevate the standard of normal living to a higher plane. A little reflection will show that disease is the principal agent of death—that death as a rule comes prematurely. Old age, the only theoretically natural and normal cause of death, is very rarely the one and only cause. The statistician gives us these figures which are presumably correct. In 1890, in Massachusetts there were 45,108 deaths of which 43,291, or 96 per cent, were assigned by the physicians reporting them to be the effect of some disease.

Let us say here, in passing, that health, like every other such name, is to be used in a relative sense. In to the life of the healthiest man disorders must frequently enter. Absolutely perfect health, as Dr. Allbutt says, is an ideal conception, as the line of the mathematician, the ether of the physicist, and the atom of the chemist. It was an early experience of mankind that certain external agencies produced disease and death, and among the earliest nations of antiquity certain practices were inculcated for the prevention of disease, and securing health. In the books of Moses we have a surprising instance of the care which was taken to prevent disease by the inculcation of hygienic principles and the adoption of sanitary laws. These laws and precepts were a part and parcel of the great religious system under which the Jews lived, and were superintended and enforced by the priests of that religion, yet, it is manifest, that the great end which was sought and in a great measure secured, was the physical health of the people.

In the distinction between clean and unclean beasts we see those selected for food whose flesh was less likely to corrupt and putrefy, and thus to engender disease. In the forbidding of the eating of blood, the most putrescible part of the animal was removed from the ordinary diet of the people. The regulations with regard to those with leprosy and other cutaneous diseases were such as would prevent the spread of many of the forms of contagious diseases with which we are acquainted at the

*Read before the Contemporary Club, Davenport.

present day. Their precautions relating to the clothing and houses of those infected, and the amount of care and attention against the spread of infections were such that if adopted with the modifications necessary for climate, would go far to suppress a large class of our zymotic diseases today. And it is surprising that the great sanitary code of Moses, which as a whole comprised great principles of action, and was remarkably complete, should have been ignored or overlooked for so long a time by modern nations which have for centuries considered the mission and laws of Moses as divine.

Disease, then, being the principal agent of death, it is to the prevention of disease that sanitary science must array itself. So we come to Sanitary Science, which may be defined as that department of human knowledge which considers those laws of the human body, and of the agents by which it is surrounded, which tend to preserve life and ward off disease and death. The practical application of these laws results in the art of preserving health, which is called hygiene. Hygiene has been defined as the art of preventing, in contradistinction to medicine, which is the art of curing disease.

Disease is looked upon very differently at the present day from what it was formerly. From the Demonic theory, of which we still have survivals in the charms and amulets which are supposed to resist bad luck—the rabbit's foot, the horse chestnut in the pocket, and the more material horse shoe over the door, and the Humeral theory which still lingers with us as we speak of the sanguine temperament of this person or the phlegmatic or atrabillious temperament of that—our English word temper is a legacy of this Humeral theory—we come down through all the mediaeval theories and systems, natural and supernatural, to what has been called by some sanitarians "the return to nature," which manifested itself in a general distrust of all systems, and a return to a study of the natural history of disease, what Prof. Sedgwick calls a "rational empiricism," serving as the basis of medical practice. The invention of the achromatic objective was a very great help in these studies of what we may call natural Etiology, and results of the highest import were reached in rapid succession until by the masterly achievements of Louis Pasteur the zymotic theory of disease was surely and firmly established. We may reckon the practice of sanitary or aseptic surgery as a direct result of Pasteur's researches and investigations.

The fact having been established, to-wit:—that infectious diseases are caused by the invasion of some organism in the human body by pathogenic germs, sanitation and sanitary methods have taken a new departure, and have shown some very creditable results of its labors. Sanitation and modern sanitary methods now have complete control of small-pox; it may or may not spread in a community, according as these methods are applied loosely or rigidly. With strict attention to every detail, small-pox may be effectually stamped out, as witness the recent outbreak among the Indians in the Tama reservation—the vigorous campaign against this terrible pestilence which was prosecuted by the State Board of Health, backed by the governor of Iowa and the secretary of the Interior, resulted in the complete wiping out of the disease in that community and so thoroughly was the entire reservation cleansed

and purified that no signs of small-pox has appeared there since. Sanitation is seeking with more or less success to remove all danger from the dreaded typhoid fever. It attacks with boldness epidemics of diphtheria and scarlet fever and it is now hard at work seeking to control the terrible tubercle bacillus. There can be no doubt that it has won signal victories already and that its practitioners may reasonably hope for fresh laurels in the future.

It will be seen that sanitary science as the guardian and defender of our bodies against the attacks of pathogenic germs is very comprehensive in its scope. It includes the questions of water supply sewerage and sewage disposal, milk supply, municipal, school and household sanitation, offensive, unwholesome or dangerous trades, quarantine laws, toxicology and many others.

The purity of water supply has always been a subject of importance and every year receives more and more attention. Not only in large cities but in smaller provincial towns, the desirability of a public supply of greater purity and large quantity is considered and discussed more than ever before; while in the rural districts outbreaks of disease have been so frequently traced directly to polluted wells that it may be safely said that at the present time the question of universal pure drinking water is one of primary importance to all classes of the community. Reports of the results of water analysis are too often regarded as being of too technical a nature to be practically useful, whereas, on the contrary, we should all be familiar enough with such reports to be able to give a sound opinion as to what direction the necessary alterations in the present conditions of supply should proceed. The analysis of water is by no means the occult, mysterious, magical thing that it formerly was. Chemistry itself, which came from Khem, the land of mystery and the sphynx, has long since ceased to be regarded as demonic magic, or uncanny witchcraft, and we have now a carefully trained school of analysts, chemical and bacteriological, whose skill is unquestioned, whose reports are true, and the value of whose assistance to the sanitarian is without measure.

Pure, as applied to water for domestic use, bears a different meaning from the strict scientific sense. Chemically pure water, that is, the compound of oxygen and hydrogen (H_2O)—like chemically pure iron, is only to be obtained by laboratory processes and with great difficulty; and as it dissolves and absorbs a varying quantity of most matters with which it comes in contact its preservation in the pure state is equally difficult. For cleansing and manufacturing purposes, it is plain that it is quite unnecessary that it should be pure to this extent, and for drinking it is sufficient that it should be as far as possible devoid of matters that would be injurious to health. The tests of potable waters are slowly coming to be applied on true scientific lines. Within a comparatively short time the physical characteristics, that is, those appreciable to the senses only, were used. That is to say, water that was bright, sparkling and clear had no color nor odor, and was piquant to the taste, was good water. At the present day, it may be said without fear of contradiction, that it is impossible to adequately judge of the wholesomeness of water by its

physical characteristics. Water from wells in towns is frequently bright, sparkling and of a piquant taste. It has often been preferred by the residents to a purer public supply, even when cheapness was not a consideration. When such wells have been ordered closed by the local authorities as a menace to public health, considerable opposition has often been encountered from the inhabitants.

The well known and often cited case of the Broad street (London) pump, the water of which was generally popular in the neighborhood, is a significant instance. In 1854 an outbreak of Asiatic cholera occurred in the parish of St. James, Westminster (London); a most careful and thorough investigation of this epidemic was made by Dr. John Snow, who found that during the first three days of the epidemic there had been 83 deaths from cholera, all of which had occurred within a short distance of this Broad street pump. He laid these facts before the guardians of St. James parish, and on the following day (September 8, 1854) the handle of the pump was removed. Just previous to its removal, however, a lady who formerly lived in the district, through preference of the brilliant character of the water, had it conveyed in bottles to her house at Hampstead for her own consumption, and a comparatively isolated outbreak of cholera in her establishment, with fatal results, occurred.

All organic matter dissolved in water, is objectionable as it is a sign of contamination not so much, however, for its quantity as for its quality. As Dr. Corell says: "Waters charged with organic matters may create true symptoms of poisoning, although they are incapable of producing specific disease if they do not contain the specific germs of the disease."

There are two zymotic diseases which have been directly traced to special bacteria in drinking water—Asiatic cholera and typhoid fever—the bacteria having the names, *Comma bacillus* or *spirillum cholerae* Asiaticum and the *bacillus typhosus*. Of the cholera we shall have very little to say, as outbreaks at the present time in this country are very rare, and modern methods of treating an epidemic are so effective that the danger would seem to be less from that germ than formerly. The B. typhosus, however, we seem to have always with us, and the price of its complete extermination is eternal vigilance. A close prototype of the typhoid bacillus and only distinguished from it by the most careful scrutiny is the B. *Coli communis*, or colon bacillus, which is constant in the intestines of man and animals, and which will always be present where typhoid is suspected. It is often found in waters and is a certain sign of pollution by excreta.

The opinion obtains very largely among physicians and sanitarians that the colon bacillus may be the primal cause of typhoid fever, that is to say, the colon bacillus introduced into the system by water or other vehicle, and finding favorable conditions and environment, will occasion the systematic disturbances that are typical of true typhoid fever.

The difficulties attending the isolation and identification of the typhoid bacillus make it often impossible to prove its presence in waters which have certainly been the source of the disease. On removal of the pollution, however, the disease has disappeared, so that the connection is un-

doubted. The colon bacillus, being a hardier germ, is not so difficult of identification, and its presence in water should be considered a signal for the gravest danger.

Nearly all of the putrefactive and pathogenic bacteria have the form of little rods, straight or slightly bent, and hence are called bacilli. These bacilli separate into individual cells by fission. Thus, one rod becomes two rods by separation in the middle, and each of these separates again, and so on. Dr. Sternberg states that under favorable conditions one rod of cell may grow and divide in twenty minutes, or 72 generations in 24 hours. The number of this family at the end of 24 hours, if all lived, would require 21 figures to express it. If there were but one generation in each hour, the family at the end of the 24 hours would consist of nearly 17 millions of individuals.

Let us say in this connection that the etiology—the search for the primal cause—of typhoid is not receiving the attention that its importance demands. This disease is directly traceable to drinking water, generally speaking; it may be, and undoubtedly has been, introduced into the system by milk which has been diluted with polluted water. This is the etiology of the typhoid epidemics in Chicago. There are a number of cases of typhoid fever in Davenport at the present time. Quite recently occurred the death of a young man from this terrible disease. No attempt has been made to trace out the primal cause of this young man's attack, nor has anything been said about the other cases. Typhoid is admittedly as serious and grave a disease as small-pox, and it is quite as important to search out and remove the cause of typhoid as it is to stamp out the small-pox. The same may be said of scarlet fever and diphtheria.

What has been said should be a matter of the commonest and most general knowledge—not relegated to scientific students or professional scientists, but well known to us all. The subject of our public water supply alone is a most vital one—very near to all of us—and it is at least unfortunate, not to say mortifying and somewhat disgraceful, that we are so generally ignorant concerning it. We should undoubtedly be better acquainted with the sanitary arts, or these methods and processes by which the applications of the principles of sanitary science are effected, more particularly the practical processes involved in the construction and operation of reservoirs, filters and other appliances in connection with the purification of public water supplies and its near relative, the disposal and purification of sewage and garbage. We are very fortunately situated here in regard to our water supply; the water is safe and wholesome, remarkably so, and the service is most excellent. Few cities on this continent are so favored in these respects as our own. This is the result simply of the most careful and painstaking attention to every detail of the system of cleansing and purification in operation here.

In strong contrast to our most admirable public water supply system is our crude and careless (not to apply stronger terms) method of disposing of our sewage and garbage. How can we complain (as we shall be in a position to do in the near future) of the pollution of our water

supply by the sewage of Bettendorf, when we are fouling the river with all the sewage and garbage that we can throw into it, and we must remember, moreover, that the Mississippi river is, and must be in the future, our only source of water supply. Methods, thoroughly efficient, of purifying sewage are now well known. The investigations and experiments in this direction, begun and now carried on by the Massachusetts state board of health, have given, and are now giving to the world the most valuable material. A full knowledge of the reports of the Massachusetts state board of health from 1900 to the present time may be looked upon as almost a complete education in sanitary science. Prof. Sedgwick dedicates his work, "The Principles of Sanitary Science and Public Health," to "the state board of health of Massachusetts. Faithful, though unpaid guardians of the people." Prof. Henry Robinson, whose right to speak with authority will be conceded, in a paper on sewage disposal, with reference to river pollution and water supply read in 1891 at the London congress of hygiene and demography said: "The action that has been taken by the state board of health of Massachusetts to protect the purity of inland waters, deserves to be specially commended as an example of broad and wise policy in instituting the systematic investigations by engineers, chemists and biologists, of all that bears upon the purification of sewage and the filtration of water. The exhaustive reports under these different heads may be fairly stated to be far in advance of anything that has been attempted in this country (England)." There would seem to be no reason, therefore, with all this information within our reach why we should not be well informed as to the best methods of purifying our sewage, so that we can turn a harmless effluent into the river. When this is accomplished, and our garbage also properly disposed of, we may, with clean hands, demand of our neighbors that they cease from polluting with their sewage our only source of water supply.

Not so far ahead of us is federal legislation to protect and insure the purity of water supply, by prohibiting the discharge of sewage and garbage into streams or other sources of supply. It would seem to be at least prudent that we should acquaint ourselves thoroughly with the best sanitary methods. Better still for us if we anticipate this legislation, which is sure to come and cannot be much longer deferred by applying these best methods in the disposal of our sewage and garbage.

VI

DIRT AND DISEASE

The three following leaflets are of such practical character and so far reaching in importance that they are reprinted with the assurance that the facts and dangers referred to, so far as known and duly appreciated, will be greatly beneficial to our people. They are a part of a series of leaflets on Hygiene and Sanitation. They are written by Prof. William T. Sedgwick, of the Boston Institute of Technology, and are published by the Institute:-

WHY DIRT IS DANGEROUS

Dirt and disease are apt to go together, but until lately no one knew why. Today we know that dirt and disease are often closely connected, because dirt is generally not merely dead earth but rather a kind of *living earth*, crowded with unseen and almost countless *germs* or *microbes*, some of which are dangerous and even deadly.

WHAT IS DIRT? We use the term dirt for various things: for "earth," for "soil," and for "stains" and "spots" of many kinds; but dirty dishes, dirty faces, dirty clothing, dirty shoes and dirty streets often mean something foul or filthy. The word *dirt* itself comes from an older word *drit* (meaning dung or excrement), and, strictly speaking, the word "dirt" should not be used for good clean earth, or virgin soil, or sands and gravels such as are found in sea beaches or sandbanks or deserts. It really ought to be kept for dung or excrement or filth, or for earth, soil or sands polluted or stained with dung, excrement or filth.

WHY DIRT IS DANGEROUS. Dirt is dangerous chiefly because it very often consists of dung, excrement or filth, and as such may be the carrier of disease germs or microbes from diseased human beings or other animals, to persons who, though well, are able to catch a disease.

In typhoid fever, for example, germs peculiar to that disease are thrown off (excreted) in the bowel discharges, urine and spit of the patient. These excreta, as they are called, may thus become carriers of typhoid fever, because they carry its germs, and linen, bed-pans, spittoons, handkerchiefs and the like, soiled or dirtied by any of these excreta, may be bearers of the living poisonous germs of this terrible disease from a patient to a laundress, a maidservant, a nurse, a friend, or to anyone whose hands become dirty by handling such articles or excreta. From hands so soiled contagion may be carried to plates, cups, saucers, spoons and, above all, food.

HOW DIRT IS DANGEROUS Dirt being often really dung, excrement or filth, is dangerous because it passes so readily and in so many ways from one person to another. We have just spoken of laundresses and others whose hands may become dirty by handling dirty linen, dirty bedpans and the like. Such persons are themselves in great danger from this dirt and often actually "catch" the disease. And if the urine or bowel discharges of typhoid fever patients are thrown into a brook leading to a reservoir or a river of drinking water, the lives of all the people of the town or city using that water are endangered. Again, if such dirt finds its way into milk there is grave danger for anyone who drinks that milk, or if into a sewer emptying upon an oyster bed, for anyone eating oysters thus sewage-polluted; or if such sewage is used to water a celery or lettuce or strawberry patch, then anyone eating such dirtied celery, lettuce or strawberries runs the risk of losing his life.

WHY DIRTY STREETS ARE DANGEROUS Dirty streets are dangerous because the dirt in this case may cling to shoes or other articles of footwear and be carried from the streets into houses where, either as fresh dirt or more often as dry dirt (dust), it may find its way to foods or other articles, which either enter or touch the mouths of members of the household. Street dirt is also dangerous when dried up and pulverized or turned into dust which may be readily lifted and blown about by winds, thus finding its way perhaps directly into the mouths of human beings, or through cracks and crevices or open doors and windows into human habitations and finally into human bodies with articles of food or drink.

Insects, such as flies and mosquitoes, may also carry dirty particles from dirty streets into houses and deposit them upon food materials in the pantry or upon the table.

We need only stop to think for a moment how really dirty the dirt of a street may be, to understand how dangerous it often is. When we remember that the streets are constantly used by dirty horses, dogs, cats, birds (such as sparrows and pigeons) and occasionally by other animals; when we remember how many people of all sorts thoughtlessly spit in the streets or on the sidewalks,—using the gutter as a kind of spittoon; when we consider how many loads of manure and other dirty materials are hauled through the streets and how many careless people throw into the streets rubbish of all sorts, such as papers, orange-peel, banana-skins, cigar-stubs and the like; when we realize that a certain number of the animals or human beings whose droppings, spit or rubbish are cast into the streets are suffering from diseases (and sometimes loathsome diseases) and especially from consumption, diphtheria, colds or other complaints,—then we can easily see how and why it is that street dirt is dangerous.

WHY DIRTY WATER IS DANGEROUS It is still easier to understand why water which contains dirt or excreta may be very dangerous, because in no way are the germs of disease more readily taken into the human body than with food and drink. We shall shortly publish in this Series a special circular upon drinking water and disease, and all who are interested should procure and read that leaflet.

WHY DIRTY MILK IS DANGEROUS Dirty milk is dangerous because the dirt most often found in milk is cow dung, or else dirt derived from dirty barns, or dirty utensils, or dirty milkmen who have handled the milk with dirty hands. Then, too, milk is good food for some germs or microbes, very much as it is for human beings, and germs will therefore grow and multiply in milk more readily than in water. There will be later a special leaflet in this series upon this subject and all who are interested should procure a copy of it.

DIRTY HANDS AND FACES AND WHY THESE ARE DANGEROUS Human hands go very readily almost everywhere, and thus only too easily become dirty. Children, for example, having soiled their hands may perhaps the next minute put their fingers upon their faces or into their mouths and thus carry dirt, and with that the germs of disease, directly into the body itself. Frequent washing of the hands is a great sanitary safeguard, and for this reason no one should sit down to a meal at which food will be "handled" without having first carefully washed his hands. Workmen away from home, taking their dinners from a dinner-pail should be particularly careful to wash their hands, especially if they have been handling paints or other poisonous substances, or dirt in any of its thousand forms.

CLEANLINESS IS NEXT TO GODLINESS This is an old saying which has come down to us as a result of long and painful experience. Why, of all things, should cleanliness be placed next to godliness? Why should not honesty, or industry, or any one of a thousand things, rather than cleanliness, be placed there? The reason probably is that, very much as godliness is believed to give to the godly eternal life in the world to come, so cleanliness, as shown by experience, tends to give to the cleanly long life in this world. Dirt and disease with danger and death, have been found by hard experience to go together, while cleanliness tends toward safety, health, comfort and long life.

HOW DIRTY PEOPLE KEEP HEALTHY Everybody who stops to think, knows that some dirty people do appear to keep healthy and live long, and we may wonder that this is so. The reason appears to be this: Some people are so strong, robust, hearty and healthy that they can resist almost all ordinary causes of disease. They can get "soaked through" in a rain without catching cold; they can go with wet shoes and stockings, or thinly clad, and yet seem to be none the worse; they may even sometimes be exposed to contagious or infectious diseases without catching them. All this is at first sight hard to understand, but if we remember that the human body is after all a good deal like a machine, such, for example, as a watch or a wagon, we can perhaps realize that some are stronger than others and when exposed to rough usage stand the strain wonderfully well, while many, though seeming just as strong, break down easily. It is true that some few human beings are so strong and robust that they can thrive for a time even in dirt, but these are the exception and not the rule, and even for them dirt is always a danger; for if these same strong people get overworked, or run down, or dissipate their strength in any way, they too generally suffer, just like their weaker neighbors, from dirt and filth.

WHY DIRTY MILK IS DANGEROUS

WHY IS DIRTY MILK DANGEROUS? Everyone knows how milk looks and how it tastes, and that it comes from cows, sheep, goats and other domesticated animals, and yet very few really know what milk is, or how it is made by animals, or how dangerous it can be when it gets dirty.

WHAT IS COWS MILK? Cows' milk is a whitish, opaque liquid specially prepared in a milk organ (the "bag" or "udder") by living cells fed and nourished by the hot blood of the animal. As it comes from the cow, milk is warm, rich and sweet. It is *warm*, because it comes from the body of a warm-blooded animal. It is *rich*, because it contains a kind of invisible liquid meat, besides fats which when milk stands rise as *cream*. It is *sweet*, because it contains considerable sugar (milk sugar). It is also *salty*.

FRESH, PURE MILK Milk like that just described is fresh and pure. It is *fresh*, because it has just come from the cow. It is *pure*, because it is milk, whole milk, and nothing but milk. Milk which has been robbed of its fat, or *skimmed*, is not whole, but skimmed, milk. Milk which has been "watered" or "doctored" is *adulterated* milk.

IMPURE MILK Milk may be made impure not only by skimming, watering or doctoring, but also by *dirt* which gets into milk from dirty stables, dirty milkmen and dirty pails, cans, bottles, strainers, or other utensils and receptacles.

BABY MILK The sucking calf gets from its mother pure, fresh and whole milk. The human baby also thrives best on its mother's milk; but when this fails, it may do very well on cows' milk, sometimes slightly altered to suit its needs. Above all, the bottle-fed baby needs *fresh, pure and clean* milk; and this, unfortunately, is often very hard to get.

STALE MILK. Milk that is pure and fresh contains a few microbes, but only a few, and these chiefly harmless or even useful *souring microbes*, which slowly *curdle* the milk and are helpful in cheese making. As milk becomes *stale*, these microbes multiply enormously and seriously alter the *milk*, so that the milk sugar disappears and an acid (*milk acid* or *lactic acid*) comes in its place. Every one knows that babies need sweet milk rather than sour milk, and it is easy to see why stale milk, which is much less sweet and pure than fresh milk, is not therefore good for babies.

DIRTY MILK Like most white things, milk very easily gets soiled or dirty, but, unlike most white things, it does not easily *show* soil or dirt. If, instead of a pailful of milk (which is a thick and foamy white liquid), a pailful of downy or fluffy pure white cotton or wool were drawn from an animal in an ordinary cow stable, it would be easy to see how particles of dust and dirt getting into the pail from the air of the stable, or the hide of the cow, or the hands or clothes of the milker, would soon make the cotton or wool dirty, and also how hard it would be to get the dirt out, once it had got in. Now it is a fact, that milk which is *fresh*, looks pure, and would be pure if it were only clean, is often *grossly* impure simply because it is *dirty*.

WHAT IS DIRT? The word "dirt" comes from an older word, "drit" meaning *dung* or *excrement* and, strictly speaking, clean soil or clean earth should never be spoken of as dirt, for dirt means excrement, filth or dung, such as cow dung. Dirt (dung) is always rich in microbes, most of which cause milk to spoil quickly, and some of which may be dangerous and even deadly. (For more facts about Dirt, see Leaflet No. 1 of the present Series.)

HOW COW'S MILK GETS DIRTY Milk as it comes from the cow is not only warm, rich, and sweet, but also perfectly *clean*. But with cow *stables* it is different. These are generally dirty, and too often the cows have no good care but must stand and lie in their own filth, which sticks to their hair, and later dries and drops off into the milk pail while the milker is milking. Too often also the dust from the hay, and dirt from the unwashed hands of the milker, fall into the pail; and too often the pails, strainers and milk cans themselves are dirty.

WHY DIRTY MILK IS DANGEROUS Dirty milk is always dangerous, both for babies and for adults. It is dangerous for babies for two reasons: first, because dirty milk quickly gets stale and spoils, thus becoming unlike mothers' milk which is always fresh, pure and clean. Cholera infantum, which kills many bottle-fed babies in very hot weather when milk spoils rapidly, is probably largely caused by stale milk. In the second place, dirty milk sometimes contains germs of dangerous and deadly fevers, such as typhoid fever, scarlet fever and diphtheria. Epidemics of these diseases among children have been known to come from dirty milk.

Dirty milk is dangerous for adults as well as for children, chiefly for the second reason just given, namely, that it is liable to contain the germs of typhoid fever, diphtheria and other infectious or contagious diseases.

HOW MILK CAN BE MADE SAFE Any milk not actually sour or spoilt by age can be made safe for drinking by heating it to the boiling point, cooling it, and using immediately. For babies, however, pasteurized milk is generally better than boiled milk. To pasteurize milk for babies, the milk should first be got as *pure, fresh and sweet as possible*; it should then be put into bottles or tins which have been thoroughly scalded and scoured. These bottles or tins should then be loosely stoppered or covered, and set into a vessel of water, which should be heated nearly, but not quite, to the boiling point, and kept there or half an hour. If a thermometer can be had, the milk (not the water outside of it) should be kept at 160° for at least twenty minutes. The milk should then be cooled and kept, on ice if possible, until it is used, but it should never be used for babies in very hot weather after it has stood more than a few hours. The feeding bottle, nipple and tube are very apt to get dirty or sour, and should be scalded frequently.

HOW CAN WE GET BETTER MILK? Cleaner, fresher, and therefore, sweeter and safer, milk is greatly needed in all our cities and towns, and this can only be secured by greater cleanliness on the part of farmers and milkmen, and all others who "handle" milk.

Buyers should refuse to take milk that is stale, dirty, or sourish, or "cowy" in odor; but, on the other hand, consumers, especially those having babies to bring up, should be willing to pay somewhat more for clean, sweet and pure milk, because it costs the farmer more to produce and deliver such milk, and he is not likely to take the pains to do this unless his customers ask for it and are willing to pay more for clean milk. It is unreasonable and foolish to spend money on luxuries and yet refuse to pay a little more for milk that is pure, fresh, and free from cow dung.

All milkers should wash their hands before sitting down to milk. The cows should be given plenty of fresh air and exercise and groomed or otherwise cared for, at least as well as horses are. It is absurd to treat horses, which we use chiefly for work or for pleasure, better than we do the cows that give us and our children food. All pails, cans, bottles, strainers and other utensils should be thoroughly cleaned by scalding water before they are used for holding milk, whether in dairies or in houses.

WHY SOME PEOPLE WHO USE DIRTY MILK DO NOT GET SICK Dirty milk does not *always* cause disease. If it did, no one would use it, and leadets like this would not be needed. It is an old belief that we must all eat, sometime, "a peck of dirt", and we certainly do have to eat more or less of it from the days of our childhood, when we play with mud pies, up to old age.

Whether dirt makes us sick or not depends largely on the kind of dirt, and also largely on our own bodily condition. Much that goes by the name of dirt is not dung or excrement and there is little harm, some people are so strong and healthy that they resist or throw off the attacks of disease remarkably well. But the trouble is that we never can know when dirt is dangerous and when it is not, or when we can resist its attacks and when we cannot. The only safe way therefore, to deal with dirty milk is to "touch not, taste not, and handle not".

WHY DIRTY WATER IS DANGEROUS

VARIOUS KINDS OF WATER There are in the world many kinds of water, such as rain and dew, sea water, spring water, well water, river water, lake water, pond water, mineral water, drain water, sewer water, manure water—besides many others.

MOST WATERS ARE MIXTURES Almost all of these are not water merely, but rather mixtures of water with various other things. Sea water, for example, is a mixture of water with large amounts of common salt; mineral waters are mixtures of water with various mineral matters (such as Epsom salts) or gases (such as carbonic acid gas or sulphuretted gases); and sewer water (sewage) is a mixture of water with the excrements and wastes of human and animal life.

WATER IS A GREAT ABSORBENT Everyone knows that water absorbs or dissolves many things, such as salt and sugar, and that these things when absorbed, though still present and discoverable by evaporation,

are lost to sight, and if present in very small quantity cannot be detected in the water by taste or smell. Every one knows also that water readily soaks into and mingles with most substances, sometimes softening them, and even detaching and floating them. It is for this last reason that we use water for washing, for the object of washing is to soak up and float off or, as we say, "wash away" dirt from sidewalks, or floors, or soiled clothing, or our own hands, faces or bodies.

WATER IS A REMARKABLE VEHICLE Water is not only a great adsorbent but very few substances in Nature are as much in motion or as active as water is. The waters of the seas and great lakes, in tides, waves and currents, are never at rest; rivers move swiftly to the sea; brooks and creeks run or pour themselves into rivers, and rains sprinkle the earth. Even in the ground, the water which supplies wells and springs has come from rain, and ground water moves slowly but ceaselessly through the earth, and at last finds its way to the sea. Now, because water is very abundant and a great absorbent, readily mingling with most things, and because it is never at rest, but nearly always moving, it is easy to see that water must be a very common and convenient vehicle for all sorts of substances. It is, in fact the ready carrier, not only of ships, boats, logs and chips, which float upon it, but also of mud, clay and dirt which mingle with and float in it, as well as of dish water, slops and the sewage of factories and cities which are absorbed and transported by lakes, ponds and running streams.

PURE WATER It is therefore, no wonder that perfectly pure water (that is to say, mere water, or water free from all admixture of other substances) is very rare in Nature and probably never occurs except in freshly fallen rain or snow on high and lonely mountain peaks far above all human habitations, and above that atmospheric dust which rises even into the upper air. Rain or snow falling from the upper sky is really Nature's distilled water, and can only be duplicated in the chemical laboratory. Most natural waters are mixtures, and therefore not, in the language of chemistry, strictly pure. The sanitarium, however, uses the term "pure" in another sense, namely, as signifying clear, soft and harmless water. Some mineral waters are clear but so heavily charged with salts as to be unwholesome, that is, unfit for drinking. Sea water belongs to this class. On the other hand some waters may be turbid with clay or clean mud and yet be entirely harmless.

CLEAN WATER When rain strikes the earth it washes away with it material from the soil, but such water will be clean even if muddy, if the ground where it falls is clean, and if the rivers and ponds are clean through which it flows, for it will then have been in contact only with clean natural earth. Such clean waters are found in uninhabited regions, in forests and on uninhabited prairies.

DIRTY WATER By "dirty" water is generally meant any water that is muddy, milky or turbid. But as we have already shown in Leaflets No. 1 (*Why Dirt Is Dangerous*) and No. 2 (*Why Dirty Milk Is Dangerous*) of the series to which the present essay belongs, the word dirt comes from an older word *drift*, meaning excrement or filth. Strictly speaking then the only dirty water is water containing excrements, or substances thrown

off from animal bodies, such as spit, urine or bowel discharges, and muddy or turbid water is not always, by any means, really dirty. Some muddy or turbid waters are entirely safe and harmless for domestic use, but no truly dirty water—as we shall soon see—ever is. Water contaminated or dirty with excrements, is often described as *polluted*.

SEWER WATER OR SEWAGE. In modern towns and cities the dirtiest, or most polluted, water is found in the sewers, because into these are emptied not only the waste waters from sinks and drains, the washings of laundries, stables, butcher shops, and the like, but also the discharges of both tubs, water closets and hospitals, the contents of spittoons, and sometimes the washings of streets and gutters. The mixture of all these and many other wastes with water in sewers is called *sewage*, and sewage is generally turbid and evil smelling and, if in any way it finds entrance into the body in dirty drinking water or milk, or upon food or otherwise, it is dangerous to human life.

WHY DIRTY WATER AND ESPECIALLY SEWAGE IS DANGEROUS If we understand by "dirty" water, water polluted with animal excrements, then it becomes very easy to see exactly why and how such water is dangerous; for such excrements often contain and may at any time contain parasites and micro-parasites—living organisms and micro-organisms—capable of producing certain well known diseases in man. One of these diseases is typhoid fever, and a large majority of the cases of this disease have in the past probably arisen from the use of dirty drinking water. Many epidemics of Asiatic cholera have also come from drinking water polluted with excrement. Diarrhoea and dysentery are believed also to arise frequently from the same source, and it is more than likely that dirty drinking water may and does cause some cases of diphtheria and tuberculosis. Patients with the sore throat of beginning diphtheria, or with the coughing and spitting of consumption, may spit in the street, the spittoon or the water closet, and these spittings mingled with water may pass into the sewers; and if this sewage or any like it finds its way into drinking water the diseases in question may be communicated to fresh victims.

Sometimes the water of a stream or pond becomes so dirty that the waste matters decaying in it produce foul odors, and small rivers into which much sewage has been discharged are sometimes a nuisance to those who live along their banks.

But generally water is not allowed to become as foul as this and is not dangerous as long as it remains in its natural channels. The greatest peril begins when dirty water is used for drinking. Any water which has been fouled by the wastes of human life is likely to contain germs of disease. The bacteria, minute microscopic parasites, some of which cause infectious and contagious diseases, are thrown off in the bowel and other discharges of sick persons, and may be present in water which is not dirty enough to show any sign of impurity to the eye. When such water is drunk by those in the right condition the germs entering their bodies may cause the disease. Sometimes a heavy rain or a thaw washes a large amount of dirt into a reservoir at once, and a sharp epidemic of typhoid fever follows, as recently happened at Ithaca, N. Y., and

Butler, Pa. Large and prosperous cities like Philadelphia and Pittsburgh have long used a dirty stream as a direct source of water supply and suffered from thousands of cases of typhoid every year in consequence.

In other places dirty water carries the germs of diarrhoea or dysentery and causes those diseases, and it is probable that diphtheria, consumption and some other diseases may be spread in the same way.

HOW CLEAN WATER BECOMES DIRTY OR POLLUTED. Clean river waters, brooks, creeks and the like readily become polluted because they are the natural drains of some region, and it is easy and convenient to empty into them all kinds of wastes, such as the sewage of towns, villages and cities, the discharges of factories, the drainage of manured fields, of barnyards, stables and the like. Too often, also, privies are made to overhang them, and in short all manner of excrement and filth, besides less objectionable wastes such as rubbish and ashes, are thrown or dumped into streams, which thus become polluted and dirty. Wells dug near barnyards, privies, sewers or in dirty soil may easily yield water which, though it *looks* clean and bright, is really polluted and dirty, especially if, as often happens, excrement finds its way in at the top of the well. Springs, even, if badly situated, may yield water which, though bright and sparkling, is really dangerously polluted with excrements.

It is a common habit to throw waste materials into the nearest stream or pond, and even in civilized communities the sewers which carry off the water fouled by water closets, urinals, sinks, tubs and so on, often empty into the nearest stream. Single houses often discharge sink drains into water courses, and privy vaults are often built so as to overhang streams. The very ground where many people live close together becomes dirty, so that the rain water as soon as it falls becomes polluted. In thickly settled regions practically all streams and many ponds are dirty. Even water in wells may be fouled by wastes which are washed in from the top or pass below through crevices in rocks or fissures in the soil, or even through the earth.

WATER THAT LOOKS CLEAN IS OFTEN DIRTY. A drop of ink let fall into a pail of water, though present is lost to sight. A drop of sewage let fall into a pail of good drinking water may escape detection, even by a chemist, and yet it is there and may cause typhoid fever or diarrhoea among persons drinking the water; hence—

THE APPEARANCE OF WATER IS NO SAFE GUIDE TO ITS PURITY. It may even happen that water which *looks* clean is far less pure than one turbid, muddy or *dirty looking*. This is a fact never to be forgotten.

HOW CAN SUSPECTED WATER BE MADE SAFE FOR DRINKING? There are several ways in which sewage can be purified, but the purification of sewage will require an entire leaflet for its consideration. For purification of suspected water there are also many methods,

If the supply of an entire city or town is under suspicion the community should filter all water before serving it to the public. This is

now done in many places, for example in London, England, in Berlin, Germany, in Albany, N. Y., Lawrence, Mass., and in many other cities and towns in the United States.

Water for family use may be made safe by boiling for half an hour and then cooling it. This is the only absolutely safe method. But if possible all water delivered to cities, and especially to dwelling houses should be above suspicion from the start, and drawn from sources and through reservoirs and pipes free from all traces of dirt (excrement) or sewage pollution.

VII

THE CIGARETTE*

(By ORISON SWETT MARDEN, Editor and Founder of *Success Magazine*.)



No words can tell the cigarette story so graphically as the pictures on these pages. I advise every cigarette victim to have his photograph taken every year and put side by side in a frame in his room, where he can see the gradual, fatal deterioration in himself from year to year. If this does not startle him and bring him to his senses, no preaching will ever do it, for the pictures will be a sermon more eloquent than ever came from any pulpit.

I leave it to others to discuss the moral side of cigarette smoking. I denounce it simply because of its blighting, blasting effect upon one's success in life; because it draws off the energy, saps the vitality and force which ought to be made to tell in one's career; because it blunts the sensibilities and deadens the thinking faculties; because it kills the ambition and the finer instincts, and the more delicate aspirations and perceptions; because it destroys the ability to concentrate the mind, which is the secret of all achievement.

The whole tendency of the cigarette nicotine poison in the youth is to arrest development. It is fatal to all normal functions. It blights and blasts both health and morals. It not only ruins the faculties, but it unbalances the mind, as well. Many of the most pitiable cases of insanity in our asylums are cigarette fiends. It creates abnormal appetites, strange, undefined longings, discontent, uneasiness, nervousness, irritability, and, in many, an almost irresistible inclination to crime. In fact, the moral depravity which follows the cigarette habit is something frightful. Lying, cheating, impurity, loss of moral courage and manhood, a complete dropping of life's standards all along the lines are its general results.

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Magistrate Crane, of New York City, says: "Ninety-nine out of a hundred boys between the ages of ten and seventeen years who come before me charged with crime have their fingers disfigured by yellow cigarette stains. * * * I am not a crank on this subject, I do not care to pose as a reformer, but it is my opinion that cigarettes will do more than liquor to ruin boys. When you have arraigned before you boys hopelessly deaf through the excessive use of cigarettes, boys who have stolen their sisters' earnings, boys who absolutely refuse to work, who do nothing but gamble and steal, you can not help seeing that there is some direct cause, and a great deal of this boyhood crime is, in my mind, easy to trace to the deadly cigarette. There is something in the poison of the cigarette that seems to get into the system of the boy and to destroy all moral fiber."

He gives the following probable course of a boy who begins to smoke cigarettes: "First, cigarettes, Second, beer and liquors. Third, craps—petty gambling. Fourth, horse racing—gambling on a bigger scale. Fifth, larceny. Sixth, state prison."

Not long ago a boy in New York robbed his mother and actually beat her because she would not give him money with which to buy cigarettes. Every little while we see accounts in newspapers all over the country of all kinds of petty thefts and misdemeanors which boys commit in order to satisfy the cigarette mania.

Another New York City magistrate says: "Yesterday I had before me thirty-five boy prisoners. Thirty-three of them were confirmed cigarette smokers. To-day, from a reliable source, I have made the gretsome discovery that two of the largest cigarette manufacturers soak their product in a weak solution of opium. The fact that out of thirty-five prisoners thirty-three smoked cigarettes might seem to indicate some direct connection between cigarettes and crime. And when it is announced on authority that most cigarettes are doped with opium, this connection is not hard to understand. Opium is like

whisky,— it creates an increasing appetite that grows with what it feeds upon. A growing boy who lets tobacco and opium get a hold upon his senses is never long in coming under the domination of whisky, too. Tobacco is the boy's easiest and most direct road to whisky. When opium is added, the young man's chance of resisting the combined forces and escaping physical, mental, and moral harm is slim, indeed."

Young men of great natural ability, everywhere, some of them in high positions, are constantly losing their grip, deteriorating, dropping back, losing their ambition, their push, their stamina, and their



energy, because of its deadly hold upon them. If there is anything a young man should guard as divinely sacred, it is his ability to think clearly, forcefully, logically.

NICOTINE IN THE FROG

Dr. J. J. Kellogg says: "A few months ago I had all the nicotine removed from a cigarette, making a solution out of it. I injected half the quantity into a frog, with the effect that the frog died almost instantly. The rest was administered to another frog with like effect. Both frogs were full grown, and of average size. The conclusion is evident that a single cigarette contains poison enough to kill two frogs. A boy who smokes twenty cigarettes a day has inhaled enough poison to kill forty frogs. Why does the poison not kill the boy? It does kill him. If not immediately, he will die sooner or later of weak heart, Bright's disease, or some other malady which scientific physicians everywhere now recognize as a natural result of chronic nicotine poisoning."

A chemist, not long since, took the tobacco used in an average cigarette and soaked it in several teaspoonfuls of water and then injected a portion of it under the skin of a cat. The cat almost immediately went into convulsions, and died in fifteen minutes. Dogs have been killed with a single drop of nicotine.

KILLED BOTH

A young man died in a Minnesota state institution not long ago, who, five years before, had been one of the most promising young physicians of the West. "Still under thirty years at the time of his commitment to the institution," says the newspaper account of his story, "he had already made three discoveries in nervous diseases that had made him looked up to in his profession. But he smoked cigarettes, — smoked incessantly. For a long time the effects of the habit were not apparent on him. In fact, it was not until a patient died on the operating table under his hands, and the young doctor went to pieces, that it became known that he was a victim of the paper pipes. But then he had gone too far. He was a wreck in mind as well as in body, and he ended his days in a maniac's cell."

UNIVERSITY RECORDS

Anything which impairs one's success capital, which cuts down his achievement and makes him a possible failure when he might have been a grand success, is a crime against himself. Anything which numbs the senses, deadens the sensibilities, dulls the mental faculties, and takes the edge off one's ability, is a deadly enemy, and there is nothing else which effects all this so quickly as the cigarette. It is said that within the past fifty years not a student at Harvard University who used tobacco has been graduated at the head of his class, although, on the average, five out of six use tobacco.

An investigation of all the students who entered Yale University during nine years shows that the cigarette smokers were the inferiors, both in weight and lung capacity, of the non-smokers, although they averaged fifteen months older.

Dr. Fiske, of the Northwestern Academy, has asked all pupils who will not give up cigarettes to leave the academy. In one year, not one of the boys who used cigarettes stood in the front rank of scholarship.

"This is our experience in teaching more than fifty thousand young people," says the principal of a great business college. "Cigarettes bring shattered nerves, stunted growth, and general physical and mental degeneration. We refuse to receive users of tobacco in our institution."

Cigarette smoking is no longer simply a moral question. The great business world has taken it up as a deadly enemy of advancement, of achievement. Leading business firms all over the country have put the cigarette on the prohibited list. In Detroit alone, sixty-nine merchants have agreed not to employ the cigarette user. In Chicago, Montgomery Ward and Company, Hibbard, Spencer, and Bartlett, and some of the other large concerns have prohibited cigarette smoking among all employees under eighteen years of age. Marshall Field and Company, and

the Morgau and Wright Tire Company have this rule: "No cigarettes can be smoked by our employees." One of the questions on the application blanks at Wanamaker's reads: "Do you use tobacco or cigarettes?"

HE IS NOT WANTED

The superintendent of the Lindell Street Railway, of St. Louis, says: "Under no circumstances will I hire a man who smokes cigarettes. He is as dangerous on the front of a motor as a man who drinks. In fact, he is more dangerous; his nerves are apt to give way at any moment. If I find a car running badly, I immediately begin to investigate to find if the man smokes cigarettes. Nine times out of ten he does, and then he goes, for good."

E. H. Harriman, the head of the Union Pacific Railroad system, says that they "might as well go to a lunatic asylum for their employees as to hire cigarette smokers."

The New York, New Haven, and Hartford, the Chicago, Rock Island, and Pacific, the Lehigh Valley, the Burlington, and many others of the leading railroad companies of this country have issued orders positively forbidding the use of cigarettes by employees while on duty.

If there is anything the youth should regard as sacred and should preserve intact at all hazards, as it affects his future more than anything else, it is his will power, and this affected very early in the cigarette smoker, so that he finds himself a slave of a practice which was once absolutely within his own volition.

KILL THE POWER OF DECISION

Another of the deadly influences of cigarette smoking is the gradual killing of the power of decision. The victim begins to vacillate, to waver, and to ask everybody's advice. He can not make up his mind about anything. He loses the power to say "No".

The symptoms of a cigarette victim resemble those of an opium eater. A gradual deadening, numbing influence creeps all through the mental and moral faculties; the standards all drop to a lower level; the whole average of life is cut down, the victim loses that power of mental grasp, the grip of mind which he once had. In place of his former energy and vim and push, he is more and more inclined to take things easy and to slide along the line of the least resistance. He becomes less and less progressive. *He dreams more and acts less.* Hard work becomes more and more irksome and repulsive, until work seems drudgery to him.

Cigarette smoking early impairs the digestive organs. It causes a gradual loss of appetite, and the wretched victim substitutes more cigarettes for food. In fact, he finally gets to a point where he becomes such a slave to the cigarette that he can not do without it.

Herein lies one of the greatest dangers of the cigarette. *It creates a longing which it can not satisfy.* Victims who have smoked from one hundred to one hundred and fifty cigarettes a day say that, while the smoking gives some temporary satisfaction, it creates a perpetual dissatisfaction, in that it never appeases the additional hunger it creates; hence the longing for other stimulants that will do what the cigarette promised but can not fulfill.



A physician in charge of a large sanitarium in the West says that three-fifths of all the men who came to the institution within a year, to be cured of the opium, morphine, or cocaine habit, have been cigarette smokers, and that sixty per cent of these pleaded, as their only excuse, the need of a stronger stimulant than the cigarette.

Excessive cigarette smoking increases the heart's action very materially, in some instances twenty-five or thirty beats a minute. Think of the enormous amount of extra work forced upon this delicate organ every twenty-four hours! The pulsations are not only greatly increased, but, also, very materially weakened, so that the blood is not forced to every part of the system, and hence the tissues are not nourished as they would be by means of fewer but stronger, more vigorous pulsations.



VIII

CREMATION VS. EARTH BURIAL

BY GEORGE P. NEAL, M. D., FORT MADISON

One million people or more are buried annually in the United States. Last year about 15,000 of the number were cremated by the method introduced by Dr. Julius LeMoyne, who erected the first crematory on this continent at Washington, Pennsylvania, in 1876.

Dayenport, Iowa, has thus far the only crematory in this state.

Dr. J. M. Shaffer, the pioneer in the cremation movement in the west, tells me that his city, Keokuk, will soon take preparatory steps toward the erection of an ample structure for this purpose.

Prof. Gross, the greatest authority on surgery in the world, was a believer in the method, and his remains were reduced to a pure white ash at Washington, Pennsylvania.

Prof. Pepper was also cremated at the same place.

Herbert Spencer, the great philosopher, was cremated recently; Frances Willard was recently cremated. The Right Reverend Philipps Brooks, P. E., Bishop of Massachusetts, wrote in favor of cremation of the dead; also Charles A. Dana, editor of "The Sun," New York City; William A. Hammond, M. D., ex-surgeon-general of the United States army; Prof. Charles Elliott Norton, of Harvard University; the Honorable Abram S. Hewitt, New York; the Rev. R. Heber, Newton, D. D., New York; Andrew Carnegie; the Right Rev. Henry C. Potter, P. E., Bishop of New York; "Jennie June" of New York; the Hon. Geo. Hoadly, ex-governor of Ohio; Clement Cleveland, M. D., New York; James Louis Howe, M. D., P. H. D., Louisville, Kentucky; Charles Francis Adams, Boston Mass.; John L. Scudder, pastor of First Congregational church, Jersey City; Mrs. Lippincott; Prof. Felix Adler, New York; the Rev. D. S. Rainsford, D. D., Rector of St. George's church, New York; Chas. A. Bacon, M. D., Washington, D. C.; Col. Thomas W. Knox, New York; Kate Field, Washington, D. C.; the Hon. Chas. W. Horner, Washington, D. C.; the Rev. Edward Everett Hale, D. D., Boston; Robert P. Porter, editor of the "Press," New York; Rose Elizabeth Cleveland; Lucy Stone, of the American Woman's Sufferage Association, Boston; Sir Lyon Playfair; Dr. A. Buccellatti, a Catholic

priest, and professor of Theology at the University of Pavia one of the most learned ecclesiastics of Italy says "You inquire of me in what relation cremation stands to religion. As a reasoning Catholic, free from any prejudice, I do not hesitate for a moment to openly declare that cremation as you and your colleagues understand it, is not inconsistent with the teachings of religion."

Rabbi Abram Simon, Congregation B'nai Israel, Sacramento, California, says, "I have no hesitancy in declaring that to my mind cremation will be the future method of disposal of the dead. It is the necessary method; it is rational; it is expedient; it is desirable."

A French historian, says in praise of the revolution, that as soon as it was seen that a great many people would have to be executed, great care was taken to minimize the pain and horror by the adoption of the guillotine. This sounds quite "Frenchy" to be sure; is also a grim species of self-gratulation, but, there is no doubt of the good intent.

Cremation can be urged on still greater grounds—we must all die; we must be buried; why not in the best fashion?

When the writer dies, it is his wish to be cremated. Let it be understood, however, that he is not clamorous in claiming an early date, but will await his turn forty years hence, and that with Christian resignation and humility.

Fort Madison, Iowa, has three cemeteries, they are all crowded—the city fathers purchased ten acres for cemetery purposes, thus far no one has been buried in this plat of ground and all parties seem adverse to taking the first step in that direction.

The contemplation of death and burial by the present Chinese method, is sufficient to cause a nightmare, or bring on an attack of the horrors.

The method of burial of our dead is becoming one of the most serious problems before the people. It is hard to break away from any established custom.

Cremation, the reduction of the dead human body by fire, was a very early wide-spread usage of antiquity. The early Aryans, Greeks, Romans, Slavs, Celts and many Germans burned their dead. It was the universal custom of the Indo-European races.

The graves of North Europe of the Bronze age contain only jars with ashes. Christianity gradually suppressed this custom with religious reasons, connected with the resurrections of the dead, but partly because it was a pagan custom.

For sanitary reasons it is to be hoped that the custom of cremation will soon be revived.

The human body consists of from 60 to 85 per cent of water, from 30 to 40 per cent of solid matter, according to the individual. In persons of normal height and weight the proportion is 60 per cent water, 40 per cent solids. By cremation, the body is reduced to its constituent elements in about two hours without disrespect to the dead or hurt to the living.

Cremation, while it may be looked upon as a grave subject, nevertheless is a living issue. The human body is combustible, if ignited it will burn till all is consumed.

A well known English sanitarian said, "The problem, what to do with the dead, transcends every other sanitary problem in its importance to the living."

It would seem that the whole question of the disposition of the dead, as the advocates of incineration have again and again asserted, is a sanitary and not a religious one. It is a question that involves no religious doctrine, and it concerns no phase of "genuine Christian" faith.

A writer recently said, "It seems strange that in an enlightened age, the cast off emblem of mortality should be associated with a future spiritual state; for the blending of the Material with the Spiritual, by merging into a heavenly body the attributes of an earthly one, betrays a gross misconception of immortality, and is worthy only of a savage race."

Too often have Christians incurred this error, unmindful of the Apostle's warning, that, "Flesh and blood cannot inherit the Kingdom of God; neither doth corruption inherit incorruption."

Our sanitary welfare and our natural affections are alone involved in the final disposition of the dead, and the method most conducive to public health and the requirements of human love are assuredly reverential and best.

At the commencement of the Christian era cremation was the prevailing custom of the civilized world, with the exception of Egypt, where bodies were embalmed; Judea, where they were buried in sepulchres; and China, where they were buried in the earth.

The Greeks, fifteen centuries before Christ, buried their dead, but in time learned the advantages of cremation, and the latter practice became universal, suicides, unteethed children and persons struck by lightning alone being denied the right.

The Romans who had originally inhumed, borrowed, in turn, the sanitary practice from the Greeks, and from the close of the Republic until the end of the fourth century of our era, burning on the pyre was the usage.

The belief that upon the sound of the trumpet of the Angel Gabriel, the dead would arise from the grave contributed to the restoration of earth burial. This doctrine was literally accepted in a physical as well as spiritual sense.

A prejudice against the custom because it was pagan, no doubt was the most potent feature in the revival of earth burial—a prejudice and a superstition—those were the causes that revived the obsolete custom of earth burial in the earliest centuries of the Christian era.

Earth burial cannot be claimed as a strictly Christian custom or rite, for it also is the Chinese method.

This renders the question paradoxical from a religious point of view, taking the view either from the Christian or Chinese point.

Under the present method of burial, the grave is frequently desecrated both for the purpose of robbery, in search for jewels, as well as for the purpose of obtaining material for dissection; graves are robbed and bodies are held for ransom. General Geo. Washington's grave was desecrated, and it is not known to a certainty as to whether the bones now in the casket are really those of the 'Father of His Country'.

The graves of many worthy men have been desecrated. That of A. T. Stewart, the millionaire merchant, is a well known example. His body was stolen from the grave and a heavy ransom exacted for the return of the body.

Hundreds of instances could be recalled. This would not be possible if cremation was in vogue.

Many years ago a commercial company engaged in the manufacturing of fertilizers, bought the bones of the soldiers who were killed and buried at Pleva. The bones were those of the Russian and Turks of the armies engaged in the struggle between the two countries at that time. The bones were dug out of the trenches and loaded upon a ship which transported the ghastly cargo to France where the bones were ground up and pulverized, then sold for the purpose of enrichment of the soil. Could the spirit of commercialism go any farther in grave robbery?

Compare this transaction to the Moslem method of cremation of heroes who fell in battle in ancient times.

Take the countries of Europe where they are crowded for room! The graveyard is invaded, bodies exhumed and the bones carted away to the bone mill, the land graded and built upon, no one concerned in the least manner.

All sentiment for the dead is lost, except in the case of immediate relatives, and they usually are so careless, that, unless, the authorities interfere, the graveyard as it is commonly named, becomes an overgrown wilderness of brush and weeds.

I am convinced that cemeteries should not exist, that the bodies of the dead should not imperil the life or health of the living.

Cremation is the logical solution of the question besides it would be the prohibition of a commercial desecration of the bones of the dead.

The Seylla of popular opinion as evidenced by the growing sentiment in favor of cremation as the Sanitary or Hygienic method of disposal of the dead, is certain to overcome the Charybdis of public prejudice which dictates an adherence to the loathsome, hideous present method of earth burial. The ultimate result in death is annihilation. "Earth to earth, ashes to ashes."

It is estimated that by earth burial this is accomplished in from three to forty years; in the interval the charnal worm is in evidence.

There is nothing so disquieting, so loathsome to the thoughts of those who have lost wife, son, daughter or parent, as the contemplation of the imprisoned remains slowly disintegrating in the cold, water-soaked, worm-infested ground; it is horrible to think of it, to write of it, or to read of it, but it is the condition that now confronts us. The theory that it is wrong to both dead and living as well, is rapidly gaining ground and taking root which will in time produce a growth of sound, healthy sentiment which will bring on a revolution which will overthrow the present unsanitary, unchristian, uncivilized, unenlightened, soul harrowing custom of defiling the air, the ground, the water of the earth with the mortal remains of the dead.

The popular sentiment at this time is so in favor of a continuance of the present method that nothing short of revolution will overcome the scruples of those who cling to it through mistaken religious ideas; the

belief in the resurrection of the body, is a stumbling block; there is nothing in the Bible to warrant any such belief; upon the contrary the opposite view is set forth.

Reverence for an old custom is so strongly implanted in the human breast, that the dangers arising to the living may not bring the human family to a realization of the perils of the proximity of contact with dead and living.

It is only a question of time when this fair land will have become one vast cemetery. Think of a custom which in this year of our Lord, 1905, treasures and preserves the infection, the contagion and all the elements of death which is daily laid away in the ground, planting, as it were, the seeds of death to encompass the certain destruction of the living.

Nothing rational can be offered in the way of argument against the cremation of the dead—still it will, in all probability, require statutory enactment to establish it as a law of the land.

Every day brings us nearer to the time when the evils of inhumation will become so intolerable that the people will demand it as a matter of rescue of life from certain premature death; life and death are incompatible, there can be no affiliation or association.

Cremation will take away much of the horror of contemplation of the living. Cremation as the ultimate disposal of the body to its original elements, is and should be a pleasant thought to the sorrowing survivors, relations, friends or neighbors.

What a solace to look upon the sweet, pure, sanitary ashes of the departed ones! What a comparison to the present hideous method of inhumation.

By cremation the body is reduced to ashes in two hours. About a quart of ashes represents the residue of a dead human body.

By cremation the dead would no longer menace the health or happiness of the living, disease would become obsolete in a very short time, the world would become the habitation of the living, all could be joy and sunshine. Cemeteries would become parks for healthy children, to play and pass the hours of Adolescence—manhood and womanhood could be lived in a land of the living, the air could be pure and tonic, water would contain the elements of life and longevity, the earth would then be nature's great disinfectant, giving out renewal of life to plant and animal world alike.

What the people want, they will ultimately get. Constantine the Great, was a great political leader as well as warrior and ruler, he saw that the Christian religion was fast becoming an important factor in politics, he wisely made it the religion of his empire.

It would be a wise political move for one of the many denominational bodies into which the church of Christ is divided if they should claim cremation as the proper Christian method. The church of the future must be the one closest in touch with the material needs of the people.

It is only a question of time when self-preservation will compel the living to act in the matter; it must be taught in the pulpit and press, lecture room and public schools.

Cremation societies must be founded, physicians must take the initiative, it must be placed before the community in letters to the press, arguments of a sanitary hygienic nature, there must be no halt in the movement. While the church is necessarily a proper field for the propagating of this sentiment, it is not necessarily a church question; it is a question of state policy, world-wide and globe extending in its interests.

In all things else the churches are keeping abreast with the times; the church is slowly but surely moulding its policies to meet the advancing thought of modern science. The greatest pulpit thinkers and orators are cognizant of the fact that science is not a detriment to the church, but upon the contrary, a most useful ally.

The world was made for the living, not for the dead; all men should strive to so live that their planet will be better because of their existence. If the living will so regulate their conduct that yesterday and today are beyond reproach, there need be no fear for the tomorrow of life, whether here or hereafter.

Cleanliness is the handmaiden to godliness. The human family can never approach Him after whose image we are made until we more nearly resemble the great model. Sanitary birth, sanitary thought and action, in life, sanitary return to the original element upon dissolution, will merge the terrestrial with the celestial, this I believe, is sufficiently sound doctrine for any church. The law regulates every individual act of man from birth to death. It gives him the right to do much as he pleases, always providing that he pleases to do that which is right. If the law regulates man's entrance into life, exercises police surveillance over his acts during his career, why should it not exercise authority as to his proper manner of exit?

If man, while alive, commits a nuisance, he is adjudged guilty of a misdemeanor, then why in the name of all that is sanitary should his mouldering, stinking, decaying, worm-infested carcass be placed in a grave to carry contagious sickness and death to the living when by cremation he can return whence he came? "Earth to earth, ashes to ashes."

In one short hour the dead are disposed of with no harm to living friends. Compare this to the present Chinese method.

It is evident, if the history of the past may be taken as a criterion, some strong, self-willed, determined man will secure a statutory enactment providing cremation as the legalized method of burial. It will come to this within a decade. All reform must fail if it lack the force to implant its tenets in the ordinances of either church or state. It does not matter, it will come, whether in the name of the Lord, via the church, or (be it enacted) in the laws of the state.

Come it will, and come it must, sooner or later, but the sooner the better. It is manifest destiny. Mistaken religious prejudice must succumb to sanitary silence for the betterment of the present living, as well as the unnumbered millions of millions yet unborn.

Iowa is a young state, yet a giant in wealth and natural resources.

Iowa people benefit from the mistakes of their brethren of the older states. It would be a most noble thing for the young state of Iowa to become the champion of legalized cremation, it would enjoy a distinction

of having enacted a law which would minimize the ravages of disease, render death remote, banish disease and the greater degree of ailments to which the human family is heir.

Why should a cemetery be allowed to imperil the health and life of a community, why should it be permitted to infect the water we drink, the air we breathe, the soil upon which we tread?

Why should we by earth burial carefull preserve the germs of small-pox, diphtheria, scarlet fever, typhoid fever, as well as all the death carrying pestilences which sweep over the fair face of mother earth, smiting the mighty, the beauty, the innocent, the old, the young, the prattling infant, striking and slaying at will, regardless of rank, age, or sex? Why we do it, and supinely permit it, is one of the paradoxes of the 20th century.

Every intelligent person is aware of the gravity of the danger as well as the need of a remedy, but few have the courage to come to the front and demand a halt. All other problems of life are dwarfish in comparison to this when its relation to the health of the human family is taken into consideration. It is the question paramount. To further evade the question is tantamount to treason. This association should prepare a bill for an act to provide for cremation of the dead within the jurisdiction of Iowa.

It is a duty we owe to our state.

IX

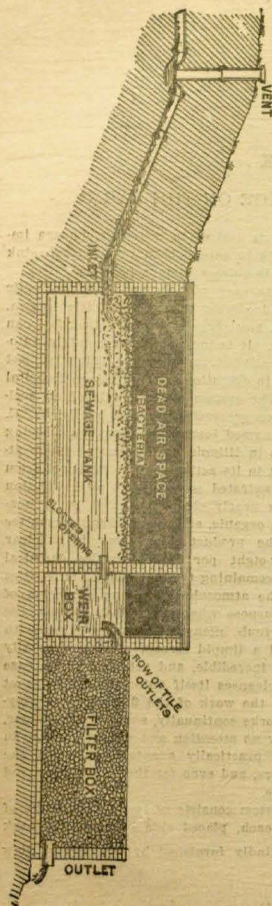
DISPOSAL OF SEWAGE ON THE FARM*

At many country homes where it is desired to introduce modern improvements in the way of waterworks to supply bath room, closet, sink and laundry, the disposal of sewage is quite a serious problem.

Fortunately it is a problem quite easy of solution by the "Septic Tank" system at once scientific and simple though but little known. The system can be easily applied in any place where sufficient fall can be secured to carry away the sewage. It is inexpensive, absolutely automatic and thoroughly effective and satisfactory. It can perhaps be best illustrated by describing a plant now in operation at the Western Hospital for the insane at Watertown, Ill. The system is the result of an accidental discovery, and was first put in successful practice by Dr. W. E. Taylor, superintendent of the above named institution though now being installed at other public institutions in Illinois and attracting much attention elsewhere. That it is perfect in its action may be gathered from the fact that it receives all the concentrated sewage from an institution whose inmates and employees number nearly eight hundred people, thoroughly and completely disposes of all organic, effete and poisonous matter with no residuum or deposit, and the product flows away in a clear sparkling stream of water, ninety-eight per cent pure by chemical analysis when it strikes the air, the remaining two per cent of impurities being liberated upon exposure to the atmosphere, leaving a stream of clear water pure enough for any purpose whatever. That this sewage can enter at one end of a tank a foul-offensive stream reeking with filth, and merge from the other end a limpid stream of water actually pure enough to drink, seems wholly incredible, and yet such is the case and the wonder of it all is that it cleanses itself automatically, without any artificial agency, solely through the work of the filth bacteria preying upon each other. This system works continually, summer and winter, year in and year out, with absolutely no attention and without change in any season, never freezing. It is practically adapted to use in the country at a distance from city sewers, and even for the use of town and cities is entirely reliable and effective.

At the Watertown Asylum the system consists of two oblong tanks of seventy thousand gallons capacity each, placed side by side, one tank

*This article and the cut were kindly furnished by Mr. Deere, plow manufacturer, Moline, Ill.



emptying into the other through a pipe. For all practical purposes, however, the tank with a well box at one end is exactly as good as two tanks, as it has been found that the water as it emerges from the first tank is just as pure as after it has passed through the second tank. The object of this weir box is to check the overflow and prevent any agitation of the sewage in the tank.

The tanks in this system are located about a quarter of a mile from the buildings. They might be located forty feet or four miles away, according to convenience, the result would be the same.

The sewage tank as shown in the illustration, consists of a brick box with eight-inch walls and floor, lined within and without with cement. Concrete would make a better tank. The roof is made air tight with a heavy coating of pitch and all crevices are tightly sealed with the same material. The sewer inlet is about two feet below the surface of the sewage in the tank. A short distance from the opposite end of the tank a cross wall is built, having a narrow end wall is a row of curved would a circular opening. In less current in discharging than inlet. Such an opening causes any greater capacity than the let. This opening has little if the tank on a level with the narrow opening extending across tile so placed that the outlet are two feet above the sewer inlet and the opening in the cross wall. The cross wall forms a weir, or dam, which regards

the outflow from the main tank, and of course there can be no discharge until the contents of the tank and weir box reach the level of the curved tile outlets. Thus both inlet and outlet are submerged about two feet, below the surface of the sewage in the tank. The filter box is filled with sand and gravel and has an outlet at the bottom through which the water finally discharges.

The operation of this system is simplicity simplified. The sewage entering the tank remains until it fills the tank and the weir box to a level with the overflow from the curved tile outlets. In twenty-four hours or a little over, after entering the tank, a scum will have formed on the surface, an inch or more in thickness, consisting of a solid mass of filth bacteria, which prey upon the poisonous matter and the solids contained in the sewage, constantly fighting among themselves and destroying each other like the Kilkenny cats, which devoured each other until nothing was left but the tail, the tail in this case being represented by the two per cent of poisonous matter left in the water as it escapes, and which is at once eliminated upon exposure to the atmosphere.

Light and air are fatal to these bacteria, hence the necessity of keeping them in a dark, air tight place that they may accomplish their work. For this reason the tank must be air tight. Again to do their work effectively they must be left in perfect quiet, hence the inlet and outlet are submerged below the surface in order that from inflow and outflow as little current as possible may be caused, and this quiet is further assured by means of the weir box.

Upon emerging from the tiles the water is clear as crystal, and by chemical analysis contains but two per cent of bacteria that would be in the slightest degree injurious to the human system. This water is allowed to filter through the sand and gravel, its exposure in this manner to the air destroying all remaining bacteria, so that it emerges from the final outlet absolutely pure.

Knowing its source, one would not care to drink it, though it is pure enough for this purpose, and stock may drink it with perfect safety.

A system of this kind will not freeze in winter, as the gases arising from the sewage in the tank generate enough heat to counteract the cold and prevent freezing. The water as it emerges will be found much warmer than the air, in cold weather.

In cases where the sewage discharge is scanty and intermittent there might be danger of the water freezing in the filter box during a long cold spell, and then it would be advisable to erect a small tight building, well protected from frost, over the whole outfit, including both tank and filter, but when the sewer is in constant use this would be unnecessary.

The secret, if secret it may be called, of the whole system is the dark and air tight tank, the submerged inlet and submerged outlet, and that is all there is to it. The bacteria will do their work if let alone. If stirred up they refuse to perform as desired. When properly working the tank

might be opened, the bottom scraped and not a handful of solid matter could be found.

The tank should be large enough to hold all the sewage that is ever likely to run into it within a period of twenty-four to thirty-six hours. For private residence this, would rarely need to be larger than three feet wide six feet deep and eight to ten feet long.

X

FLIES AS CARRIERS OF DISEASE

BY J. O. COBE, M. D., SURGEON UNITED STATES PUBLIC HEALTH AND MARINE
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Read before the California Public Health Association, at Riverside, Cal.,
April 17, 1905*

Seemingly the most puzzling problem may, after all, be the simplest; the most subtle disease the easiest controlled, after once we lay bare its causative agent. We actually turn up our noses at yellow fever now, for all the interest is gone. Puh! the mosquito; why, how simple! And typhoid fever? why we know all about that! And plague, and malaria, and dengue? Insects—flies, mosquitoes, fleas! We know all about that, you will say; but, even though you know, let me ask you, how do you apply such knowledge? How many of you, and how many physicians in your acquaintance, make yourselves active in the suppression of disease conveyed by insects? As I look into your faces, I doubt if there is a single man among you free from one guilt, free from running an open incubator for the propagation of disease-carrying flies. I refer to your stables, where the manure is thrown out in a pile and left to answer nature's means of hatching out the fly. And, being guilty of this public nuisance yourselves, I am certain that not one of you has ever written a warning word or raised a protesting voice against this affront to common decency.

I shall not weary you with a description of the genealogy of the fly or of his anatomy, or his nearly human instincts of liking company. You know all about him—how he follows you to the table occasionally, in spite of the most careful housekeeper, tasting your coffee, taking a bath in the cream, playing Bre'r Rabbit and Tar Baby in the syrup. He's a very domestic playful creature, the fly, but he's not clean; he is dirty, this insect is. Yes, he is that and more, for if I call him by the right name I would say he was nasty. Born on a dunghill, his nature reverts to the filthy as soon as your back is turned. Even though you allow him the grace of your company, he imposes upon your confidence, and when you are not looking he wallows in waste barrels, paddles in dirty water, wades knee deep in the offal of cattle, feeds upon all kinds of conceivable filth. And if he is sojourning in the country and the sanitary arrangements are imperfect as they too often are he whets his appetite for the

*Reprinted from the Southern California Practitioner.

dinner which he will try to take in company with you by a formal visit to the privy. Oh, he is a gourmand, this fiend, the fly! He will tackle anything to eat or drink from typhoid soup *a la* Chicago to sputum jelly *a la* t. b.

This pestiferous insect has many chances to communicate disease from one person to other or to plant the infectious saprophytes upon food. In cholera epidemics, it has been demonstrated that flies become the medium of infection by planting the vibrio upon food both by contact from their feet and wings and from their dejecta, which are loaded with bacteria. Wherever large bodies of men go into camp typhoid fever is nearly certain to break out, even though the water-supply is carefully protected from contamination. Such outbreaks are due to fly infection of the food-supply. Sporadic cases of typhoid fever in country settlements are more often the result of fly infection than of water infection.

Tuberculosis is one of the most puzzling of our contagious diseases, and the manner of its spread from one person to another is one of the hardest problems before the sanitarian today. You believe, and I believe that it is a respiratory disease, borne into our lungs by means of contaminated dust, but I believe probably more than you do. I believe that the greater sources of infection by the bacillus comes about by means of the fly planting sputum on food with its wings and feet and dejecta. This is not something new; it is an old theory. Spillman and Householder called attention to the possibility of infection in tuberculosis in this manner several years ago. Hoffman fed flies with sputum and recovered bacilli from their fecal matter. Heyward has recently reported a series of experiments covering the ground more fully than Hoffman.

Typhoid fever, cholera and tuberculosis are the most prominent of the infections conveyed by the fly, but I believe that several diseases, and especially plague and leprosy, may be conveyed in the same manner. Diphtheria is one of these, but there is not so much of a chance for the fly to pick up the infected mucus in this malady; but in plague epidemics and in leper countries it seems but reasonable to believe that, in the poverty and squalor where such cases occur, the fly would pick up the infection and plant it on the food of others who live in this environment. Of course, as I speak to you, your minds have naturally asked if these diseases are ingestion diseases, and I answer you that I believe they are. Kitasato has demonstrated that plague develops from feeding experiments, and there are many strong reasons for the existing belief that leprosy is an ingestion disease. Personally, I believe that plague is spread commonly by means of body parasites, though there is little doubt that many cases originate from infection by the way of the intestinal tract; but with leprosy, I am firmly convinced that the disease is caused from eating infected food, and, if this is true, then this contagion is most likely planted upon such foods by flies that obtain the infection from open sores and the nasal and bronchial mucus of old cases, which is said to teem with bacilli.

Now, let me picture to you some of the habits of the fly, and then we shall see if it is unreasonable to believe that he is an important factor in the spread of disease. Turn about you and see the swarms of flies

upon decaying vegetable matter—in the garbage cans, on the manure piles, everywhere. Watch the flies swarming upon the filth of the streets, such as sputum and spit, and bones and decaying vegetables. Follow him further, and see him alighting upon the candy offered for sale by the street vendors, and on all the fruit at the stands, especially the grapes and dates. Don't tarry here too long, for you will be disgusted, and will cease to eat fruit flavored with fly specks; keep right on in the quest after this insect's habits, and notice the bakery where you buy your bread and cakes and pies—flies there to put on the finishing layer. And the meats, have you observed how they are carried in open wagons through the streets without protection, covered with flies, and then hung up in the shop where these same flies and others swarm upon them? Cooking this meat does not change the fact that this is simply nasty. There is no other word for it.

Then, after you have been in the butcher shops, keep right on to the restaurant kitchens, and alleys back of them, especially the cheap ones. I don't say you ever eat there, but if you ever have, you won't go there again if you will but make one visit to these kitchens. But there are others who must, perchance, eat there, and it is these whom we should protect, not alone from these filthy insects, but from the disease which they carry.

And we must go into the shops and homes of the poor—those unfortunately whose houses are not protected by screens to keep out flies. There you will indeed be disgusted! Flies everywhere! In the children's mouths and noses; in the house, out of the house; on the food left there upon the table, which is never cleared; on the food left over, and which the children eat at all times between meals; in the milk-pitcher; in the soup; in the molasses; in and upon every conceivable thing! But at this point I feel that you are beginning to doubt. You are saying to yourselves that it is true that the fly is filthy, but, you are even now saying that the food is cooked, and that the process will kill any bacteria that might have been planted by flies. Ah, but you forget and overlook the danger. It is granted that cooking will destroy all of these bacteria readily, but it is not here that the danger lies. It is the food which has been cooked and upon which the fly afterward alights that is the real danger, and the longer this food remains uneaten after this contamination the greater the probability that a colony has grown, thereby increasing the dosage of infection. For you must see that in cholera, say, where the fly planted but a few bacilli on potatoes or a bread pudding, or something left over from a meal, a rapid growth would follow in a few hours' time, increasing thereby the number of bacteria enormously.

This is no idle picture of the dangers from fly infection. I have spent considerable time in watching flies, and we know that their dejecta alone contain millions of bacteria. I have furthermore paid particular attention to their habits in homes of the poor, for here is where there is the greatest danger. The poor, nearly universally leave their tables set with cold food left from the previous meals. Flies assemble in great numbers

upon this food, and from time to time children run in and help themselves, the remainder of the food being served at the next meal. Now, let us suppose that there is an open privy on the premises or near by, but—there is no need for me to paint the picture further. You know where that fly has been. If there are cases of typhoid fever about, all the more probability that the fly will carry the infection to others. In the Philippines it was hard to check cholera because the flies contaminated the foods and sweet stuffs sold by the vendors. And if typhoid fever and cholera, why not tuberculosis and leprosy? Just spend some of your time watching flies after sputum and spittle in your streets. Now, if there is a consumptive near who is careless, as most of them are, is it unreasonable to believe that flies take this sputum and deposit it on grapes and dates and candies which you and your family eat; or that, in the homes of the poor, they would not pick up the sputum of a case, either in that house or from a near-by one, and deposit the bacilli on the left-over food?

There is no need for me to go on indefinitely enumerating things which you know to be possible and probable—yes, actual—but about which you are more or less indifferent. All that I suggest in this paper, being hygienists and sanitarians, that you set the example to the laity—that is, if you believe in these dangers as I do. For how else shall we be able to enforce our advanced knowledge upon the attention of the public?

Let me suggest that you begin the warfare against the fly by talking against him to his natural-born enemy, the housekeeper; but she is not slow in accepting the new when it concerns the betterment of humanity and the prevention of disease. Here her heart beats true and understandingly. Therefore, let me urge you to talk flies (and other insects, too, for that matter) to your lady friends.

And why not try and get started a movement to compel livery stables and dairies to properly care for the manure.

Also, urge upon every one the screening of houses, and especially of food, and when you buy food patronize those stores that try to be clean.

And, as a sample of what a hot fight you can get into, make an effort to compel some of the filthy sellers of candy, fruits, bread and pastries to protect their articles from fly contamination.

As sanitarians, lend the helping hand to the ladies in their efforts to make the city officials enforce the garbage contracts. Last of all, as the saying goes, let each of you doctors who keep horses sweep before your own doorstep.



ROBERT EMMET CONDIFF, M. D.

Member of State Board of Health from January 31, 1893 to
January 31, 1907. Was twice president of the board.

XI

THE WORK OF THE STATE BOARD OF HEALTH

The text to which I invite attention is found in the Code of Iowa, Chapter 16, Title 12, which in substance reads, "An ounce of prevention is worth a pound of cure".

The work of the State Board of Health, as well as all other bodies of the kind, municipal, state and National, is built on the theory that disease has a definite cause and is not a manifestation of Divine displeasure. That is to say all communicable disease is due to the transmission from one individual to another of certain minute organisms, either vegetable or animal in kind. This presence is necessary to the production of disease.

The cause of all infectious diseases being thus defined and fixed on a definite something, it seems reasonable to believe that such diseases are preventable and it is to this work the efforts of all sanitary organization has been directed and for this work our State Board of Health was created.

The identical organism or germ causing each particular disease has not as yet been isolated and described. A number, however, have been carefully studied and enough of their habits and mode of development known to place them, beyond doubt, as the causative factor in the production of such diseases as diphtheria, consumption, typhoid fever, malaria, yellow fever and many others and this is acknowledged by the whole scientific world without exception.

This discovery has changed the attitude of the medical profession toward the public in certain directions.

"Heretofore the physician was expected to have in his medicine case a "cure" for each disease. His failure to produce the desired cure was taken as evidence of his incompetency."

At the present time the educated physician who practices scientific medicine knows more of the nature of disease and the cause producing the same than was known a few years ago, hence he knows his limitations and if he be honest, he will frankly tell his patients the truth, namely, that most diseases are self limited in themselves and his efforts must be given in assisting nature in contending with the invading host of disease producing germs.

*Address by Dr. R. E. Condiff, Sioux City, President of the State Board of Health before the Conference of the Iowa Health Officers' Association and State Board of Health at Waterloo, July 10, 1906.

Some one has said "the dear public do not always appreciate this honesty on the part of the doctor. A large number of otherwise intelligent persons are still looking for the man with the "cure". The pretender who claims to have an antidote for each disease is often applauded and praised while the conscientious physician is discredited."

And while it is true the great principles governing the causation of disease is not understood, or at least is not appreciated, as they should be by persons outside of the medical profession the fact still remains that the day of scientific medicine has dawned and that of empiricism in medicine has passed and gone. For with all our people, aside from this credulity born of fear, there is still a large measure of good sense and sound judgment, which in the end will reject the loud claims of the ignorant and arrogant pretender whose assertions are not founded on fact; and the time is coming when this educational work will claim the attention of the general public.

It has been my high privilege to have had a small part in the work of the Iowa State Board of Health in painting out the dangers of communicable disease and the means of lessening the chances of contracting the same. This work is being done in several ways. By improving sanitary conditions in and about houses; by careful inspection of water supply; by pointing out the dangers of adulterated foods; by carefully considering the causes producing infectious disease; and by isolation, quarantine and disinfection when such preventable and communicable diseases exist from any cause.

By these means diphtheria, scarlet fever, typhoid fever, smallpox and other diseases including tuberculosis have ceased to be the awful epidemics of two or three decades ago and only exist in isolated communities and only there, through the ignorance or neglect of some one who should know better.

All these diseases and many others are clearly preventable, and the time is not far off when it will be as great a reflection on the physician and the Board of Health to have a preventable disease endemic in any community as it now is for the surgeon to have pus in his wounds. Both conditions are evidence of carelessness and uncleanness and both are preventable by intelligent care.

The second way of combating disease consists in so fortifying the healthy body against the invasion of the disease producing germs, that normal resistance on the part of health tissue gives immunity, or at least lessens the chance of infection and renders the otherwise fatal germ innocuous. Two conditions are necessary to this production of this class of disease. We must have the seed which is the disease producing germ, and we must have the soil for its growth and development, which is a local or general vitality less than normal in its powers of resistance.

In this age of cramping commercialism too little attention has been given the production of a physically perfect and healthy individual. Our civilization is a one-sided civilization. The State Board of Health believes we are not here as a finality but as a possibility. The stockman improves his herds by careful selection, yet our laws permit the criminal, the syphilitic, the mental and physical degenerate to marry and perpetuate his kind and no hand is raised to stop this crime against civilization.

We believe the common welfare of all, and our own best interest lies in building up a perfect physical manhood and womanhood; for a healthy body is the best barrier against infectious disease and the best residence for healthy mental and moral impulses.

Our duty as citizens is plain. We must recognize the fact that we are living in closer touch with each other than ever before and that our interests are common. Knowledge of these preventable conditions carries responsibility for their existence and we ought to be alive to that responsibility. Conditions have materially changed in the last few decades and we are living more in a year than our fathers lived in a score of years. Our opportunities for good and evil are greater today than ever before in the history of the world, and with these opportunities come corresponding responsibilities. We cannot escape these new responsibilities, thrust upon us by changed conditions, but as Mr. Roosevelt puts it we should strive to acquire more of the positive virtues in dealing with them, such as courage, aggressiveness, trustworthiness and honesty of purpose in our relations with one another, if we would worthily serve our generation.

The best citizen is the man who recognizes the rights of others as well as his own and who cheerfully assumes his share of responsibility in promoting the general welfare of all. I believe there was never a time in the history of our country when clean, interested, high minded citizenship was in greater demand than today, because of these changed conditions and added responsibilities.

Compare, if you will, the locomotive engines of fifty years ago with the monster engines of today. Who of us are prepared to say their responsibility for work has not increased a hundred-fold by the fact that the ability to do that work has been provided in the greater capacity and the greater opportunity.

If we want our work to count we cannot be glass engines running smoothly, noiselessly and without friction. Such a machine may be a pretty toy but it is absolutely useless. It cannot do a pound of work and its responsibility in the busy activities of modern life is represented by a double naught. We feel, and we want you to feel that these opportunities impose a duty upon us. Surely indifference in this important matter is disloyalty.

So much in regard to the attitude of the State Board of Health toward these important questions. We believe nearly all of the diseases now prevalent are clearly preventable and it is your duty and our duty to call attention to the facts, and while I cannot help but regret that so little attention is given these matters by our legislative bodies and by the general public, I am here to say much has been accomplished under existing conditions. We have been at work, and that work is bearing fruit. The popular idea seems to be that the State Board of Health is composed of a lot of high salaried officials who have nothing to do but draw their princely stipend and pass rules for quarantine. Do you know the work of the State Board of Health, together with the State

Board of Medical Examiners, has cost the state scarcely a dollar in compensation to its members since its organization. The small annual appropriation has been expended in paying a Secretary, in sending out educational publications; in publishing and sending, monthly, a Bulletin to the various local boards and in an honest endeavor to bring these vital questions before common people whom they directly concern.

Quarantine, which, while under existing conditions is necessary, is at best a barbarous measure and a reflection on the intelligence of our people. There is not a member of this Board who will not be heartily glad when a better knowledge of infectious disease by the general public will make quarantine unnecessary and when the hardships incident to the same will no longer be imposed.

The work done by the members of this Board has been honest work, hard work and often discouraging work. It has been done without compensation and with great financial loss to most of its members, but it is beginning to awaken a larger interest in these important problems and is being appreciated as is evinced by this gathering today. The time is coming when the people will do honor and give proper credit to the work of Rogertson, Becker, Kennedy, Shrader, Sroggs, Emmert, McKlveen and other pioneers in the field of preventive medicine in Iowa.

There is much to be accomplished for we have scarcely made a beginning and it is to this work we invite your earnest co-operation. Let me call your attention to some of the important problems to be worked out by our people right here in our own state.

The recent investigation of food products by the National Government brings the question of food preparation and food adulteration very close to our people from both a sanitary and commercial point of view.

Another important question is the pollution of our streams by the discharge of factory waste and sewage into our sources of water supply. It is reasonable to presume our Legislature would reflect the wishes of our people in so important a question, yet some of us went before our recent Legislature with a most favorable proposition in which our streams were to have a complete and systematic sanitary survey and the expense divided with the National Government through an arrangement made with the Bureau of Geological Survey. Yet we were unable to interest the law making body sufficiently to get even the small appropriation of two thousand dollars for the work. The fact is legislators are politicians and in this matter, as in all other matters, we may call from the house-tops and our call will be unheeded until the people become interested in this kind of legislation.

Iowa is essentially an agricultural state. Our products go into the markets of the world and command the highest prices. This is as it should be for there is no reason why Iowa should not produce butter, cheese, meat and grain equal to, if not superior to, any section of the world. A great menace to this industry lies in the prevalence of tuberculosis in dairy farms and feeding yards. All the Government inspection that may be imposed will not correct this threatened danger unless the stockmen and breeders are alive to the situation and make a study of the best means of freeing our swine and cattle of tuberculous disease by careful inspection and proper housing before they are put on the

market. There is small profit in feeding a diseased animal for months, only to have him consigned to the tank by a Federal inspector. Prevention is the best possible cure.

Human tuberculosis is everywhere prevalent in our state. The belief has some where gained credence that the rural sections are exempt—that the disease is confined largely to towns and cities. This is a great mistake. The disease is essentially a house disease and exists quite as much in the country as in the city. I know of no better breeding place for tuberculosis than a farm house shaded by an abundant growth of trees, with damp surroundings and perhaps inadequate ventilation. Such a house when once infected becomes a veritable hotbed of tuberculosis and in my judgment is the source from which our herds of cattle and swine first become infected. This is a question of great importance to all of us.

I want to advocate the employment of a competent inspector by the State Board of Health, whose duty it shall be to inspect such localities and advise as to the best means of correcting unsanitary conditions. I believe such an official, who would come in direct relation with the people most interested as an educator and instructor, would do an immense work in the field of preventive medicine right here in our own state.

More attention should be given to milk inspection. Particularly is this true in regard to milk used for infant feeding. Our state requires that milk sold shall contain a certain amount of butter fat, but there is no inspection further than this. Milk from tuberculous cows is often sold on the market, and is fed to infants, whose diet consists so largely of such food. This is a very important problem.

Another matter affecting the welfare of our people is the sale of patent medicine containing a large percentage of alcohol, opium and other ingredients detrimental to health.

All these questions must be worked out and the proper remedy intelligently applied.

The Bacteriological Laboratory for the study of disease is a great help to the work of the Board and a benefit to the people generally in dealing with the more prevalent diseases such as typhoid fever, tuberculosis and diphtheria. Positive knowledge of conditions is obtained by laboratory tests, and release from quarantine granted at the first possible moment commensurate with safety.

I believe, however, the establishment of sub-stations in the larger cities would facilitate the work of the Laboratory in making quicker returns and be altogether more satisfactory. Perhaps it is not germane to the subject for me to speak here of the work of the physicians of the Board in striving for a higher standard of medical education. I may be pardoned in saying there has been persistent and successful effort to elevate the standards of entrance requirement to our medical colleges. Young men entering on a course of medical studies are now required to have at least a good English education. The college course has been lengthened and strengthened year by year until I believe it can be truthfully said the Iowa requirement is equal to any of our sister states, and while this is as it should be in justice to the matriculant, nevertheless it is a matter of considerable pride to be classed in the first division in our standard of medical education.

Another work long sought for, and now accomplished, is the reciprocity agreement between Iowa and a number of other states having an equally high standard of medical requirement, whereby practitioners holding our certificates are permitted to practice in other states without examination. This has perhaps given us standing with other State Boards more than any other one thing, and it is a great blessing to some of our ablest and oldest physicians, who for reasons may wish to take up a residence in another locality.

This is a hurried review of the work of the Board. There are important phases which time will not permit me to touch upon, such as school and personal hygiene, factory and mine inspection and many other problems which will suggest themselves to the student of preventive medicine.

We are extremely fortunate in having no dissention in the various interests represented in the Board, but have worked together in harmony and for the common good of all. The Board was created with the thought of bringing together in one working body the largest possible number of interests. It was to be non-professional and non-political. I sincerely hope it will always remain so, for I know of no greater calamity which might overtake our work as sanitarians than to have politics mixed with our affairs.

To retain the confidence of the people we represent, our work must be non-political and on the highest possible plain of endeavor. I am glad to say personal ambitions and special interests have never been tolerated. Faithful, self-sacrificing, conscientious service has characterized the work of the State Board of Health.

And now just a word to its members. This address is in a sense my valedictory. My term of fourteen years service will soon be brought to a close and some other man will sit in my place and take part in your deliberations. I cannot let this opportunity pass without expressing my extreme gratification that I have been privileged to be so long with you and to have a small part in the work of the Board. This association has taught me to have the highest respect for its members both past and present. My association with you has been most cordial and I have looked forward to our meetings with pleasure. I can only add I never expect to be associated with a truer lot of men, men who have higher ideals and whose devotion to duty shall be with me, a pleasant memory.

XII

DUST AND ITS RELATION TO DISEASE

FOR centuries dust has been the bane of the thrifty housewife, as she has regarded it as a form of filth, not necessarily dangerous to health but because it mars the effect of the home and soils linen, silks and other household fabrics, as well as the hands and persons of those who come in contact with it.

Since delicate machinery has come into such general use, dust has acquired another enemy, as those who have charge of such machinery realize that it injures and finally destroys it.

If dust, by its mere presence, so readily harms industrial machinery, may it not affect the human machine in much the same manner? Of this there can be no question; but as regards the human machine, dust may also be a disseminator of disease, by carrying and depositing specific micro-organisms within the body, where they may multiply and induce various disease processes.

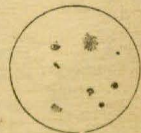
The effects of dust on the human be-



A cluster of the bacilli



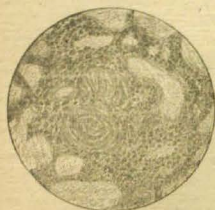
A single colony of rod-shaped dust bacteria



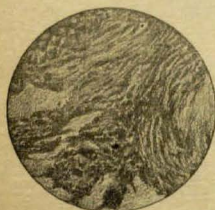
Agar Plate. Exposed for one minute before sweeping



Agar Plate. Exposed for one minute after sweeping



Steel Grinder's Lung. x 70 diameters



Coal Miner's Lung. x 70 diameters

Lymph Node,
almost
completely
filled with
coal dust

ing depend upon the following factors:

First—The *kind* of dust.

Second—The *amount* of dust.

Third—The constancy of its presence.

Fourth—The susceptibility of the individual.

Fifth—The measures employed to protect the individual against its entrance.

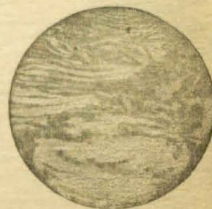
The composition of dust varies, according to the locality and local conditions. For instance, in a city where much coal is burned the atmosphere is constantly loaded with small carbon particles, commonly termed "soot." In stone works the dust consists almost entirely of fine particles of stone, generally very hard and with sharp edges. In factories, where metal is ground, we find a metallic dust, also with sharp edges.

Coal dust, or "soot," is far less dangerous to the human being than stone or metal dust, as the particles are much more finely divided, with rounded edges,

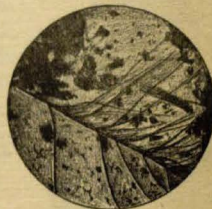
so that when such dust enters the body it does not set up as great an inflammatory reaction.

It has been known for years that workers in stone, and metal grinders, suffer more frequently from bronchial and lung diseases than do individuals in other trades. Coal miners suffer more from these diseases than do other miners, as the coal is very readily reduced to a fine powder with sharp edges. The deposits of coal dust in the lungs and bronchial lymph nodes of a coal miner may be very great in amount, causing these organs to appear black in color and very tough and gritty on section.

The term given to deposits of dust in the lungs is pneumoconiosis. This is the general name for such deposits, but special names have been given for the various kinds of dust. For instance, the deposit of coal dust in the lungs is called anthracosis; of metallic dust, siderosis;



Lead Miner's Lung. x 70 diameters



Dust from Rag Cleaning



Chronic
Interstitial
Pneumonitis

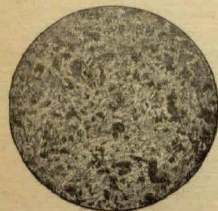
of stone dust, chalicosis; of clay, aluminosis.

Some forms of dust are colored; for instance, rouge, which is used for polishing glass, induces a brick-red deposit in the lungs of workers at this trade, while other iron compounds give the lungs a dark brown to black color.

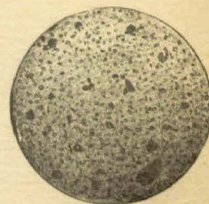
Lungs which have been constantly irritated by dust are readily infected by pathogenic organisms that may gain entrance, causing abscesses and gangrene. Pulmonary tuberculosis is a very frequent occurrence among such workers, as is also pneumonia. This chronic irritation sets up a proliferation of connective tissue, and as this increases in amount it encroaches on the bronchi and alveoli and finally obliterates many of them, and in a long-standing case large areas of lung are converted into solid masses of connective tissue. This condition is termed chronic interstitial pneumonitis. It is not seen as fre-



Needle Grinding



Lead Dust from Printing Shop, and
Type casting



Sandstone



Granite



Pollen Grains
of the Heather

quently as formerly, as the worker who is exposed to such dust is generally protected by a filter adjusted over nose and mouth to prevent the entrance of irritating particles.

The following conditions may be and generally are due to the irritation induced by dust:

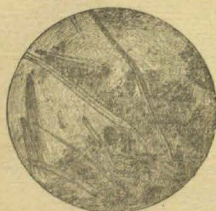
Chronic conjunctivitis.

Chronic inflammation of the nasal mucous membrane.

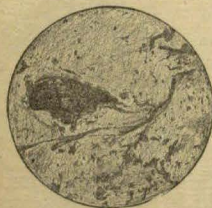
Chronic bronchitis.

Chronic pneumonitis.

Catarrh of the upper air passages is frequently due to chronic mechanical irritation resulting from the inhalation of dust of various kinds. The body tissues endeavor to rid themselves of the foreign particles in various ways. In the eye, they are washed out by the constant flow of the lachrymal secretion, which carries them to the nasal cavity, from whence they are blown out with the nasal mucus. From the bronchi



Dust from Wheat Cleaning



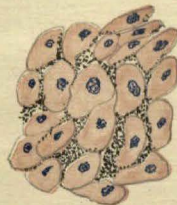
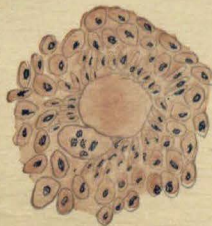
Cotton

they are removed by the ciliated epithelium, which is in constant motion, and when there is enough mucus and foreign material gathered, it is expectorated, so that the greater amount of material is thrown out of the body. What little remains is taken up by the phagocytes and carried to the lymph channels or nodes and there accumulates.

In some portions of the world the dust is composed of substances which are soluble in the secretions. These may be divided into two classes—inorganic and organic.

In the first class are included the various salts which when dissolved in the secretions cause a chemical irritation. A good example of this type is the dust of the alkali deserts of our western states.

To the second class belong the pollen of various plants which, in peculiarly susceptible individuals, cause an intense inflammation, known by various names,

Tubercle Bacilli
in sputumCoal Dust deposit
in a lymph node

Miliary Tubercle

such as "Hay fever," "Rose cold," etc. It has recently been discovered that these pollens contain a substance which is readily soluble in the conjunctival and nasal secretions. This substance is a toxin and can be extracted from the pollens, and when such extract is applied to the mucous membrane of a susceptible individual it sets up the characteristic symptoms of Hay fever.

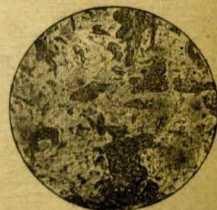
An antitoxin has been obtained for this toxin of the pollen by Prof. Dunbar, of Germany, but it is still on trial and it cannot be said to what extent it will be useful in the treatment of this affection.

Decaying animal and vegetable matter when blown about is not only unpleasant to the nostrils, but can exercise an irritant effect and thus cause inflammatory reactions of various mucous membranes, inducing conjunctivitis, rhinitis, laryngitis and bronchitis.

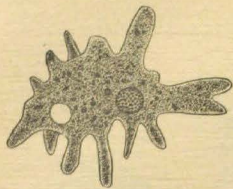
Many have believed that pathogenic



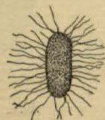
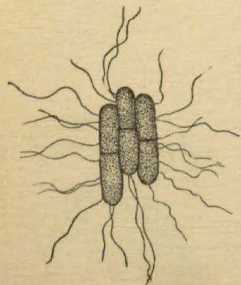
Sawdust



Mother of Pearl



Amoeba.
The most primitive
animal known,
with an encysted
amoeba, which is
able to live in dust



Bacillus Subtilis.
the spores of which
are present in dust

micro-organisms are blown about by dust, but, as a matter of fact, the great majority so distributed are harmless to man, and if the dust is dry and has been sufficiently exposed to sunlight none of the common pathogenic organisms are viable.

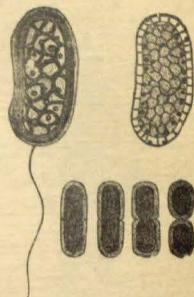
If the dust is but partially dry it may contain any of them, as all animal excreta contains them in varying numbers. For instance, it is well known that every time one talks, coughs, laughs or causes an increased current of air through the respiratory passages or mouth, minute particles of mucus, saliva, food remnants, or other substances that may be in the path, are driven out, together with the various micro-organisms that inhabit the respiratory or alimentary tract. An individual suffering with a simple sore throat, due to a streptococcus infection, may distribute large numbers of streptococci, and various currents of air may waft them hither and thither and some

other person may inhale them and become infected, unless the tissues are able to destroy the organisms before they gain a foothold. If, however, these minute particles are completely dried the streptococci are destroyed and rendered innocuous.

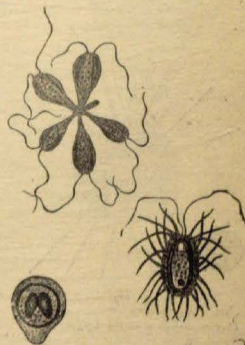
Similarly, a tubercular individual may distribute the bacilli characteristic of this disease and thus infect other persons.

In the pneumonic form of bubonic plague the infectiveness of the secretions of the respiratory tract is so great that, during the epidemic, many are infected in this manner.

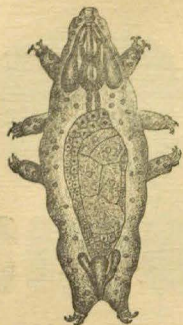
If, however, the ejected particles are perfectly dried, the contained micro-organisms are destroyed and the material is innocuous. The great danger lies in the *partially dried mucus*, for if the outer layer be dry it protects the interior by preventing evaporation, and in this manner organisms in the center of such



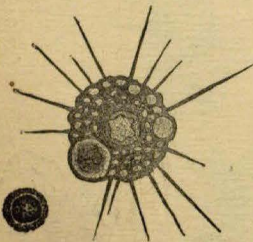
Two Bacteria, greatly magnified to show the details of their structure, illustrating the way in which they multiply by division



Two stages in the growth of a flagellated-muscelled animal, and an encysted individual



Microscopic "Water Bear".
A little animal which shrivels
up on being dried, but becomes
active again when placed
in water.



Sun Animalcule
(Actinophrys) and its cyst.

a mass may be fully virulent for a considerable length of time.

Major Firth, of the English army, has stated that the typhoid bacillus may remain alive and fully virulent for twenty-five days in dirt which has been dried and blown about as dust. If this is true, it is very interesting, as it means that the *Bacillus Typhosus* is a much more resistant organism than we have ever supposed.

There is a group of organisms which, under unfavorable conditions, can render themselves more resistant. This is accomplished by the process of spore formation.

To this group belong the tetanus bacillus and the bacillus of anthrax.

Spores are very resistant to dry heat and to various chemicals, and it takes a long time to destroy them by boiling.

They are, however, readily destroyed by moist heat under pressure. The spores of tetanus are widespread and



*Bacillus
Tuberculosis*
Pure Culture.
Stained and
highly magnified.

are found in the soil, especially where houses and stables have been. These spores may be blown about for years without losing their ability to revert to their vegetative stage, when they obtain a resting-place on suitable soil. It is thus important that all air taken into operating rooms should be filtered, to prevent the development of post-operative tetanus.

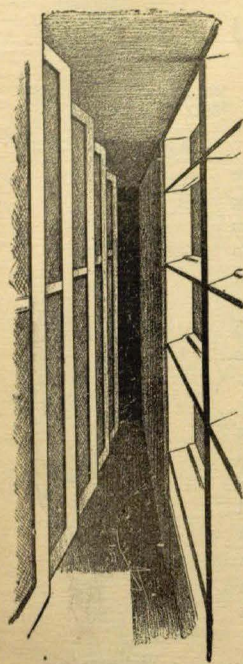
There is a group of diseases—the acute exanthemata—whose infectious material seems to be conveyed in the air very easily. It is fairly well established that smallpox can be conveyed through the air, and as it has been recently shown that its primary lesion is somewhere in the respiratory tract this seems to be a reasonable inference.

Although not definitely established, the same may be true of scarlet fever and measles.

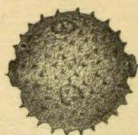
For this reason, rooms in which numbers of children congregate should be



Wheel Animalcule
from street dust, after
immersion in water.



Air Filter at intake
of Hotel St Regis N.Y.



Pollen Grain of
Pumpkin

well ventilated, so that any infectious matter may be quickly dissipated.

The ideal method of cleaning is by means of the vacuum process. By this method a vacuum is produced in two or more tanks, metal pipes leading from these tanks to various places; to each of these pipes a strong rubber hose is attached, and these rubber tubes end in various ways. The vacuum is established and the ends of the rubber tubes are run over the parts to be cleansed, and thus whatever dust is present is sucked into the tubes and down into the tanks. By this method no dust escapes to settle down again, but is collected in the tanks and thence removed.

Cleaning by compressed air is faulty, because it does not remove the dust, but blows it around to let it settle again.

Aside from the vacuum method, the best way to remove dust is with a moist cloth, for the dust clings to this and cannot be blown about. This latter



method is used in nearly all hospitals or where cleansing is intelligently done.

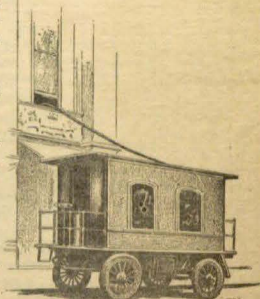
The scattering of moist tea leaves accomplishes the same purpose, and many housewives use this method to "lay the dust," as they express it.

In conclusion we may sum up as follows:

1. Dry dust, in *small quantities*, is harmless except when a wound is exposed.
2. Dry dust, inhaled in *large quantities*, is dangerous because it may, mechanically, induce chronic inflammatory changes in the bronchi and lungs.
3. Partially dried dust may contain pathogenic organisms, and should be regarded as dangerous.

Every person exposed to large quantities of dust should wear an air filter over mouth and nose.

In cleaning, the dust should be gathered together and removed; not scattered about, as is usually the case.



Sweeping by the
Vacuum System

Extending from the Vacuum Machine up into the interior of the building to be cleaned are lines of rubber hose through which the dust is by suction brought down into receiving tanks.

XIII

THE TREATMENT AND CONTROL OF THE TUBERCULOSIS PATIENT IN HIS HOME

BY LAWRENCE F. FLICK, M. D., DIRECTOR OF THE HENRY PHIPPS INSTITUTE, ETC.,
OF PHILADELPHIA*

At last the genius of man has brought to bay his arch enemy. From the dawn of history until within the memory of even young men tuberculosis has been the unconquered foe of mankind carrying on its devastation in every clime and under every possible condition. It has destroyed man and all his friends in the animal kingdom; it has roamed at will and has never known any hindrance. Now it is about to be exterminated from the earth.

This great achievement of civilization has been made possible by the wonderful discovery by Pasteur of a new world, the world of micro-organisms. Pasteur's discovery was the culmination of research by scientists who had gone before him, but it was his genius which interpreted correctly the enigmas which had been partly solved by his predecessors. Pasteur was followed by a host of ardent explorers of the new world, each bringing to light some new fact which augmented man's power over disease.

Quite naturally one of the diseases upon which the new light was most likely first to be thrown was tuberculosis. In every part of the world scientists devoted themselves to the study of this disease. Koch's discovery of the tubercle bacillus moreover made investigation along the line of this disease more attractive and easier than along lines which had not yet been so well explored, so that the growth of knowledge about this disease was more rapid than about any other. The bacteriologist, the pathologist, the clinician, and the veterinary surgeon have vied one with another to throw new light upon this subject.

The bacteriologist studied the life history of the tubercle bacillus and made this microorganism as well known to us as are many of our domestic animals and house plants. He made us familiar with the conditions under which the microorganism grows, the food which it consumes,

*From American Medicine.

the products which it gives off, and the things in nature which are inimical to its life. He revealed to us its variations in form, its chemie composition, its idiosyncrasies, in short, gave such complete knowledge about it that it has come into our power to control its existence.

The pathologist studied the tissues upon which the tubercle bacillus grows. He revealed to us the changes which take place in those tissues and the process by which the microorganism gets into them and again gets out of them. He made known to us which tissues of the body are most prone to invasion by the microorganism and what the consequential damages are in the organism by reason of the injury done to the tissue invaded. He also made known to us the process by which the organism endeavors to make repairs and what the condition of the tissue is when it has been repaired.

The clinician gathered up and analyzed the symptoms which are set up by the organism when invaded by the tubercle bacillus and its associates, and showed us the value of such symptoms as indicators of the invasion of the disease before its presence can otherwise be demonstrated. He showed the methods by which the disease is communicated from one individual to another, the conditions under which implantation takes place, the environments which are most conducive to the development of the disease, and the circumstances under which the disease can best be resisted. He studied the relationship between nutrition and tuberculosis, and made known to us the mode of life and the kind of food which help the organism to recover when it has been invaded by the disease. He also proved the value of many medicinal remedies in helping nature to throw off the disease. He taught us the best practical measures for the prevention of the spread of the disease by the destruction of the microorganism before it can enter another host.

The veterinary surgeon demonstrated the unity of tuberculosis throughout the animal kingdom. He showed us that while the tubercle bacillus varies in form and in likes and dislikes accordingly as it has grown upon different soils it nevertheless is the same microorganism wherever it may grow, and can be trained to grow upon soils to which it is not congenial. He showed us that if tuberculosis is to be exterminated it must be attacked from all quarters, and that the possibility of its intertransmission between human beings and animals must be obviated. He pointed out to us the various ways by which intertransmission of human and animal tuberculosis may take place, and the rules and practices which ought to be observed in order to avoid such intertransmission.

Knowledge gained from all these sources enables us to lay down certain definite propositions about tuberculosis which point the way for both treatment and control of the tuberculous. 1. Tuberculosis is a house disease; it runs its course in the house, and it proves fatal in the house. Without the house it could not continue to exist. 2. Tuberculosis is a family disease. The home which is the center to which the family is drawn also is the center from which tuberculosis radiates. All

the sweet ties of affection which hold members of a family together are mediums of distribution of tuberculosis. Intimacy is the line along which contagion travels. The kiss, the handshake, the embrace, and every custom which from time immemorial has been consecrated to the home, is a means of spreading tuberculosis. Intimacy, as a rule, is necessary for the spread of the disease. 3. Tuberculosis is, in a measure, an occupation disease. Occupations which bring people close together under unhygienic conditions, particularly where irritating substances are given off during the manufacturing processes, damage the mucous membrane of the lungs and serve as mediums for conveying tuberculous matter, often are the means of spreading tuberculosis. The enclosure in which such occupations are followed moreover frequently produce soil for the tubercle bacillus in the occupants by the debasement of nutrition from want of air. 4. Tuberculosis is a disease of the poor, downtrodden, and debased. The tubercle bacillus does not grow well in healthy tissue. It cannot get a foothold in the tissues of a person who is in a strictly normal condition. It must have tissue which is already somewhat debased, for a place of beginning. Overwork, underfeeding, under-airing, dissipation, physical injury to tissues by traumatism or by other diseases, are the usual forerunners of tuberculosis. 5. Tuberculosis is a slow, long-drawn-out disease which, as a rule, kills by inches. Even the cases which are known as galloping consumption, have had a long period of unrecognized quiescence. The average duration of tuberculosis probably is ten years. Perhaps two-thirds of this time is a period of delicate health merely. There are no symptoms, but the person is looked upon by everyone as a delicate person. 6. Tuberculosis is a curable disease. The tubercle bacillus is not a virulent parasite for human beings. It is only when associated with other microorganisms that it becomes dangerous, and even then it does not destroy much tissue at a time. Unfortunately, when unchecked, it continues to make inroads until it has destroyed so much tissue, and has damaged so many organs that the toxemia of a simple ordinary cold may prove fatal. Its inroads can readily be checked however by healthy nutrition. Just in proportion as the body is restored to a normal condition of health the tubercle bacillus deteriorates, ceases to reproduce itself, and gradually becomes exterminated. Every living organism has within itself the power of self-protection by which it can fight off parasitic life. It can produce an antitoxin which neutralizes the toxins produced by the parasitic microorganisms, and it can produce cells which destroy the microorganisms themselves. That the human body can destroy and cast out tubercle bacilli is no longer to be doubted. 7. Tuberculosis can be prevented. This is the brightest star in the firmament of modern science. No deduction from the new knowledge about tuberculosis stands out more boldly and unequivocally than this. That which is due to life is perpetuated by reproduction; stop the reproduction and it becomes extinct. The tubercle bacillus ordinarily only can reproduce itself in a host. Its life outside of a host is dormant. It hibernates, so to speak, during this time in a cache consisting of broken-down tissue or dead tissue cells. This cache is easily

discernible at the time that it is given off by the old host. The matter which constitutes the cache is known is common parlance as pus or sputum. It is through this pus or sputum, and through this alone, that tuberculosis can be conveyed from one person to another. Science has discovered many substances which will destroy the life of this pus or sputum and destruction of the pus or sputum by fire is a very easy matter. Sterilization or destruction of all matter given off by the tuberculosis at the moment when it is given off absolutely prevents new implantations. What can be done with one tuberculosis person can be done with a hundred, and what can be done with a hundred can be done with a thousand. Theoretically, at least, it is possible for every tuberculous person on earth to sterilize or destroy every particle of tuberculosis matter before any of it can get into another person. Practically, the prevention of tuberculosis, then is a question of ways and means of how to bring every tuberculosis person under control. 8. Tuberculosis exists in every part of the world, in every climate, and in all seasons of the year. It has existed at all times of which we have any historic record. It is the most prevalent of all diseases, and causes more deaths than any other disease. It causes from a seventh to a tenth of all the deaths throughout the world. The treatment and control of the tuberculosis, therefore, is a universal problem. It must be worked out in every part of the world, and the methods used must be such as can be used in any part of the world. 9. The extermination of tuberculosis in animals must go hand in hand with the extermination of tuberculosis in human beings. Every precaution must be taken against intertransmission of animal and human tuberculosis. Each of these tasks should stand on its own foundation, but they should be carried on simultaneously and in harmony one with the other. The crusade against tuberculosis in the human race should not be made to carry the burden of the crusade against tuberculosis in the animal kingdom by the dissemination of false doctrines about intertransmissibility, neither should it be impeded by the dissemination of false doctrines about nonintertransmissibility. That animal tuberculosis can be conveyed to human beings is a settled fact. How frequently or infrequently this happens has little bearing upon the subject one way or the other, except in so far as false notions about this matter may lead to improper measures for the prevention of tuberculosis.

Tuberculosis can be successfully treated anywhere. Climate has practically nothing to do with the matter. Formerly, climate was looked upon as the most important factor in the production of tuberculosis, and consequently it was looked upon as a most important factor in the treatment of it. For many men it is difficult even at the present time to give up these ideas. It has been demonstrated, however, by practical tests, that the disease can be successfully treated anywhere, and comparative statistics of results obtained show conclusively that climate practically plays no role in the matter at all. Even in large cities, on small streets, good results are obtained at the present time by modern scientific treatment.

Modern scientific treatment of tuberculosis means a carefully selected diet, life in the open air, regulation of exercise and such medication as will help injured organs to do their work in a physiologic way. The diet must be one which will give the largest amount of nutrition with the smallest possible amount of labor on the part of the organs making the nutrition. Food, therefore, must be selected not only for its nutritive value, but for its nutritive value plus the ease with which it can be transformed into tissue. Of all foods, milk undoubtedly is the one which gives the best returns in nutrition for the smallest consumption of energy. Next to milk come eggs, after these beef and mutton, and then leguminous vegetables. Meat contains a great deal of nutritive value, but its transformation into tissues uses up a great deal of energy, and for this reason it ought to be used only once a day. For the average tuberculosis subject a good diet is one consisting of one meal of solid food a day, and three quarts of milk and six raw eggs a day. Fruit of all kinds may be allowed, and some of it should be used daily. Nuts which are easily digested, such as almonds, walnuts and pecans, may be used, and it is good practice to permit of their use at pleasure, as they require considerable mastication. No food should be permitted which is used for the mere purpose of tickling the appetite, and above all things, pastry and dainties should be forbidden. The milk and eggs may be distributed over the day at intervals of two hours, but no milk nor eggs should be taken within two or three hours of the full meal before or after. The doctor should always definitely lay down the time at which food should be taken and the amount to be taken, and he should impress it upon the patient that the full quantity must be taken each time, whether there is a desire for it or not. When patients are assured that they can take this quantity of food and that it is beneficial to them to take it, even when they are nauseated, they will take it as a matter of course, whereas otherwise, with preconceived notions about their inability to take it, they will decline it.

Life in the open air must mean just what the words indicate. The patient should be in the open air 24 hours out of the 24. If it is possible to put him out in a tent he should be put in a tent. If this cannot be done, the hours which are spent in the house must be spent in a room which is well ventilated and in which the windows are always open. There must be no half heartedness in this matter and drafts must be absolutely disregarded. A room should be selected in which there are windows on two sides at least, and these windows must at all times be kept open. This does not mean in fine weather only, but at all times, winter and summer rain and shine. If windows must be closed temporarily during a storm to protect the furniture, they must be opened as soon as the storm is over. Rebreathed air is very harmful to a person suffering from tuberculosis and must be avoided under all and any circumstances. Products of combustion are carried off by the lungs in the exhalation of air. These substances are poisonous to the organism and thus do harm aside from the injury which results from insufficient amount of oxygen. Air purifies itself by circulation and for this reason

outside air is practically always free from any poisonous products of combustion. Air in a room can only be purified while in motion, hence a room is never properly ventilated unless air can enter from one side and pass out from the other. When a patient is exposed to a draft he should be protected against reduction in temperature by proper clothing. Night air must be supplied as freely as day air. If anything, night air is superior to day air particularly in cities because it is free from irritating substances. In this connection it should always be borne in mind that it is physically impossible to take what is ordinarily known as a cold from exposure to a draft. Colds are all due to microorganisms and always are contracted by contagion.

It is very important to control the amount of energy used up by muscular action in the treatment of tuberculosis. Muscular action consumes energy and throws into the circulation products of combustion. When the organism is already on the verge of bankruptcy it is an easy matter to bankrupt it by an excessive amount of physical exercise. Persons who have fever or who are far advanced in the disease should not be allowed to take any exercise at all. As the fever disappears and as the patient gains in strength exercise may be gradually taken up, but it must be so gradual that fatigue may always be guarded against. One severe fatigue may change a favorable case to an unfavorable one. It is safest to begin with a few minutes' mild exercise, such as walking twice a day, and gradually add from two to five minutes a day, until the patient is able to walk several hours without fatigue. When fatigue is experienced by the amount of exercise permitted, the time should be cut down to a point at which fatigue does not ensue. With patients who have cavity formations and who have dilation of the right ventricle, exercise should be taken up with the most extreme care. With some of these patients physical exercise can never again be taken up and they must be content with a life of inactivity. They have lost their reserve lung capacity and are unable for this reason to take exercise without putting a severe strain upon their organism, and especially upon the heart.

Medication in the treatment of tuberculosis should always be a secondary matter and should be resorted to only as a help to organs which are unable fully to perform their functions. In most cases stomachics and digestive ferments are indicated, because the stomach is not well able to do the amount of work thrown upon it unaided by artificial means. The bowels, which are apt to become clogged, need to be cleaned out frequently by some such purgative as epsom salts or castor-oil. The heart needs to be closely watched and when over acting, as indicated by an accentuated second sound, should be relieved by some such drug as nitroglycerine. Opiates and alcohol should never be used; neither should any drug which is depressing either upon the nervous system or upon the heart. The old-fashioned cough medicines should be absolutely eschewed. When the patient is suffering from a cold some benefit may be derived from the ammonia preparations, but even these should be used only temporarily. A safe rule is to use no drug unless there is a positive indication for it.

The control of tuberculosis can be summarily expressed in one word, cleanliness. It must be absolute cleanliness, however, and cleanliness in the light of modern science. Old ideas about cleanliness will no longer suffice. Civilization long since has taught us to dispose of certain dejecta of the human body in a way which prevents the return of those dejecta into the body with food and drink before they have been broken up into their elementary constituents by the chemistry of nature. Civilization, however, still permits us to carry with us on our person other dejecta which are even more prejudicial to health or if not to carry them about with us on our persons to throw them anywhere that is convenient. In the light of modern science, such practices can no longer be looked upon as consistent with cleanliness. We now know that the human organism frequently has to combat parasitic microorganisms, and that it throws out these microorganisms by way of the respiratory tract as well as through the excretory organs. It may be, indeed, when all the facts are known, that we will find that parasitic microorganisms are more frequently thrown off by way of the mucous membrane of the respiratory tract than by any other channel. The secretions of the mucous membrane of the nose, throat, and lungs, and the broken down tissue which is thrown off from the lungs in cough, very frequently contain microorganisms which have been ejected from the system because they are prejudicial to it. Expectoration, therefore, of all kinds as ordinarily practiced is prejudicial to health and is inconsistent with cleanliness from a scientific point of view.

Inasmuch as the mucous membrane of the respiratory tract may become a culture medium for parasitic microorganisms, and the lung tissue itself may become such a medium, and inasmuch as when these parts do become culture mediums for parasitic microorganisms nature throws off these microorganisms through hyperscretion or through broken-down tissue, all of which must come away in the form of expectoration, it goes without saying that expectoration is just as necessary to physical well-being as is the removal from the body of any of the dejecta. Expectoration, therefore, cannot be stopped, and in itself cannot be at variance with cleanliness. The method of disposing of expectorated matter however, is at variance with cleanliness, and must be changed. In the light of our new knowledge, all matter which is given off from the mucous membrane of the respiratory tract must be disposed of as carefully and with as much forethought for the safety and comfort of others as are other dejecta of the human body. This can easily be done. Already civilization has provided us with means of disposing of expectorated matter with perfect safety to ourselves and others. For people who expectorate very little a paper napkin and a paper bag in which to deposit the paper napkin are all that is necessary. These can be had very readily at the present time at stores which deal in such commodities. For people who expectorate a great deal many devices are at command. Paper pocket spit cups are ingeniously gotten up for us, and various kinds of impervious paper boxes nicely fitted into a tin box with a cover on are available. When none of these things can be had an ordinary earthen coffee cup

with a handle to it, into which ordinary Red Seal lye and water may be deposited, can be had. It is possible, therefore, at the present time for everyone to dispose of expectorated matter without prejudice to himself or to any one else.

For the poor, the simpler the method of disposing of expectoration, the more likely it is to be carried out. The manner of doing it moreover, must not attract too much attention. Many devices for the disposal of expectorated matter are objectionable from this point of view. Nobody, for instance, cares to be seen with a sputum flask, and there is something suggestive of uncleanness in the use of such a flask which is repulsive to a great many people. Paper napkins and paper bags can easily be concealed, either in a cabba or a pocket, and have the additional recommendation of being very cheap. Among the poor, therefore, more probably can be accomplished by recommending the use of these means for the disposal of expectorated matter than by any other.

The treatment and control of tuberculosis in practice, at least, falls to the doctor and nurse and health departments. Unfortunately, none of these is at present properly equipped for the work. The education and training of doctors and nurses in the past has, if anything, unfitted them for the scientific treatment and control of the tuberculous. Departments of health, with few exceptions, are not well enough organized and equipped to carry out the modern requirements for the prevention of tuberculosis. It therefore yet remains to educate properly and train the people who are to carry on this work and to organize and equip the departments of government through which the official part is to be accomplished.

Quite naturally, the most efficient factor in the treatment and control of the tuberculous would be the family physician, if he were properly equipped for the work. Could every family physician of the land at once be transformed into an expert on tuberculosis, the tuberculosis problem could be solved in a very short time. This, of course, cannot be done. With the older physicians, the best that can be hoped for is to convince them that tuberculosis is contagious, curable, and preventable, and to induce them to drop old methods of treatment with alcohol, opiates, and depressants, substituting therefor common-sense diet with outdoor life. It is not in the nature of things for them to be able to equip themselves to make early diagnosis and to apply modern remedies in a scientific way. They could do much, however, if they would look upon every one in delicate health as a victim of tuberculosis in some form and would institute what may be called hygienic treatment by diet and outdoor life with a view to reestablishing good health. For these men every delicate person should be looked upon as a tuberculous subject until the contrary is proved. Of the younger men some have had better training in the modern methods of physical examination, but even with these the training has been entirely theoretic, and they often are at sea when they come to its practical application. It is surprising how few men in the practice of medicine are capable of making an exact record of the condition of the heart and lungs. It is the experience of all

sanatoriums which have been established for the treatment of early cases of tuberculosis that examiners for the sanatoriums, who have been carefully selected in the vast majority of instances, send cases relatively far advanced for incipient cases. The fault undoubtedly has been with our medical schools, and this fault still exists. Physical examinations of the heart and lungs is an art and not a science, and can only be learned by apprenticeship under a master. Medical colleges teach it as a science, but not as an art. Unfortunately, they are not equipped to teach it as an art. In order that medical colleges may be able to teach the art of early diagnosis in tuberculosis it will be necessary for them to equip wards for the treatment of tuberculosis in all its stages according to modern methods. Every medical college should transform the top story of the hospital attached to it into a ward for the treatment of tuberculosis, with a roof-garden as part of the equipment. In this way the college would attract the material necessary for the training of its students. It would be able to treat successfully tuberculosis in all stages of the disease, to make cures in many of its cases, and, quite naturally, the tuberculous poor would soon flock to it in consequence of the work done. Such an arrangement would enable colleges to train men properly in the early diagnosis of tuberculosis and in the modern scientific treatment of it.

Nurses, like doctors, will have to be educated along new lines to make them available in the crusade against tuberculosis. As nurses are now trained, they are of little value in the care of consumptives. In the first place, by reason of false ideas about the contagion of tuberculosis, they have such a fear of the disease that very few are willing to be engaged in such nursing. All over the country hospitals and sanatoriums for the treatment of tuberculosis practically have to train their own nurses, either out of raw material or out of nurses who have already had a general training. It is even difficult to get this raw material. A woman who has been properly trained to take care of a consumptive need have no fear of the disease, because she controls the situation and has it in her power to make the consumptive absolutely harmless. It is largely because trained nurses know nothing about tuberculosis, and have not been trained to nurse tuberculous subjects that they have such a fear. In such a large undertaking as the stamping out of a disease like tuberculosis, it would be worth the while of every hospital in the country to open a ward for the treatment of consumptives, if for no other purpose than the proper training of nurses in the care of them. Next to the doctor, no one could do more effective work than the nurse were she properly equipped.

Departments of health will nearly all have to be reconstructed before they can take an active, efficient part in the crusade against tuberculosis. As things now are, very few governments have departments of health properly organized for this work. For governmental control of tuberculosis, it is necessary to have first, machinery for the registration of every case of tuberculosis. Second, machinery for supplying material aid and proper instruction to the consumptive poor, who are unable to

help themselves. Doctors and nurses should be sent to these poor people to treat them, educate them and help them. Third, have hospitals for the treatment of the dying consumptives who cannot be properly cared for at home, and sanatoriums for the treatment of earlier cases. Fourth, legal enactment and machinery for the enforced isolation of vicious consumptives who refuse to be instructed and persistently decline to live up to such rules as are necessary for the protection of others. Fifth, machinery and equipment for the sterilization of all places which have been occupied by consumptives. Sixth, legal enactment and machinery for the regulation and control of ventilation and cleanliness of all work-shops of any and every description. Seventh, legal enactment and machinery for the control of the spread of tuberculosis in domestic animals. A department of health properly organized for such work as here outlined and properly equipped must be more than the tail of apollitical kite. It must be a department of the government depending upon the central executive power properly organized under the law, and operating strictly within the limits of the law. As yet, there are few such departments of health in existence.

In conclusion, it only remains to be said that the treatment and control of tuberculosis must largely be carried on in the home of the patient. The disease is too prevalent to be dealt with in any other way. Hospitals and sanatoriums are proper adjuncts, but must be viewed as adjuncts. They are necessary for the treatment and control of exceptional cases. The majority of cases can be treated and controlled in their homes, and as a matter of economy, will have to be thus treated and controlled. The most efficient machinery for this work undoubtedly is the dispensary. A dispensary for the treatment and control of tuberculous poor should be opened by departments of health and by all hospitals. The Henry Phipps Institute for the Study, Treatment and Prevention of Tuberculosis opened as dispensary on a large scale on the general plans laid down by Calmette, at Lille, in February, 1903, and since then the city of New York and a number of New York hospitals have opened dispensaries modeled on the same plan. The operation of these dispensaries has clearly demonstrated that they are the most efficient weapons so far known in the crusade against tuberculosis. The results of treatment are exceedingly good and the educational work and control of patients is quite efficient. Best of all, the patients are educated and restored to health without undue interference with their ordinary avocations and without pauperization. Every department of health should establish a dispensary at once, and cities in which no department of health exist should get up organizations for the purpose of opening dispensaries.

XIV

FIRST ANNUAL REPORT OF THE IOWA STATE BOARD OF HEALTH BACTERIOLOGICAL LABORATORY

BY HENRY ALBERT, M. D., IOWA CITY, DIRECTOR

To the Iowa State Board of Health
GENTLEMEN:—

I have the honor to submit this, the first annual report of the Director of the Iowa State Board of Health Bacteriological Laboratory (Sept. 1904-05.)

The Laboratory of the Iowa State Board of Health was established in connection with the department of Pathology and Bacteriology of the State University located at Iowa City, in accordance with an act of the last General Assembly of the state. The bill establishing this laboratory (House file No. 455) is as follows:

Be it enacted by the General Assembly of the State of Iowa:

SECTION 1. The bacteriological laboratory of the medical department of the State University, at Iowa City, is hereby established as a permanent part of the medical department of the university work, and it shall in addition to its regular work perform all scientific analyses and tests, chemical, microscopical and other scientific investigations, which may be required by the State Board of Health, and it shall make prompt report of the results thereof, under such rules and regulations as the said Board of Health may from time to time adopt.

SECTION 2. The professor of bacteriology of the medical department of the State University shall be the director of said laboratory and shall make or cause to be made all such analyses, tests and investigations as shall be required by the State Board of Health as provided in the preceding section, causing the same to be made without delay and giving such analyses, tests or investigations the preference of the point of time over all other work and shall make prompt report of the result thereof to the Board of Health or to such person or persons as the Board of Health may by rule or designation, designate.

SECTION 3. There is hereby appropriated for the purpose of more perfectly equipping the present bacteriological laboratory at the State University and for the purpose of enabling it to perform the duties hereby imposed, and to provide it with the necessary apparatus and assistants to render the same effective, the sum of one thousand dollars (\$1,000) for apparatus and the further sum of five thousand dollars (\$5,000) or so much thereof as may be necessary biennially to be the additional salary of said director, the assistants, the expenses of said laboratory as may be necessary by this act, including postage, stationery and other contingent and miscellaneous expenses which may be incurred in the maintaining of said laboratory and perform the duties required therein by the provisions of this act. The director shall receive such additional salary not exceeding twelve hundred (\$1,200) dollars per year as the State Board of Health may fix. The appropriation hereby provided shall be expended in the manner provided in section two thousand five hundred and seventy-five (2575) of the code.

SECTION 4. This act, being deemed of immediate importance, shall take effect and be in force from and after the date of its publication in the Register and Leader and the Des Moines Daily Capital, newspapers published in the city of Des Moines, Iowa.

At the April (1904) meeting of the State Board of Health, the Board appointed a committee consisting of Drs. Powers and Linn of the State Board of Health, and Dr. Henry Albert, director of the newly established laboratory, to visit other laboratories in order to determine the nature and scope of the work to be carried out in the laboratory, in order that it may most usefully serve the physicians and the people of this state in their combat against infectious and contagious diseases. This committee visited all of the more important state and city bacteriological laboratories of this country and reported to the full board at their last July (1904) meeting. The scope of the work of the laboratory and its methods of operation having been defined the Board instructed the director of the laboratory to secure the various apparatus and diagnosis outfits to be used in the laboratory, and to establish culture stations in every city and town of the state. The following circular of information was issued:

CIRCULAR OF INFORMATION

CONCERNING THE IOWA STATE BOARD OF HEALTH BACTERIOLOGICAL LABORATORY

For several years it has been the earnest desire on the part of the Iowa State Board of Health that the State should make some provision for bacteriological laboratory work to assist in making diagnosis and quarantine regulations of the more important contagious diseases.

The last General Assembly (1904) of the State passed House file No. 455. (See above for copy of bill.)

The Board has decided that the scope of the work of the Laboratory be limited at present, to the routine diagnostic work in connection with diphtheria, typhoid fever, tuberculosis and rabies, it being understood the examinations are made only in the interest of the public health. The bacteriological and chemical analysis of the public water supplies—a problem of very great importance—cannot properly be undertaken at the present time except when the public health is eminently concerned, as in epidemics of typhoid fever. At such occasions it shall be the duty of the director of the laboratory to have such bacteriological and chemical examinations of the water supply, milk supply, etc., made, and such other investigations conducted as shall tend to lead to a discovery of the source of the epidemic, whenever he is requested to do so by the council of the city or town concerned. Such examinations shall only be made when the director or some one whom he may designate visits the place of the epidemic, personally, makes all necessary investigations and collects his own samples of water and such other substances as he may choose. Such investigations and examinations shall be free of charge, but all the expenses of the visit shall be borne by the community for which the examination is made. In case of epidemics of diphtheria or whenever it is desired to examine the throats of a large number of school children, the local Board of Health has the privilege of calling upon the director of the laboratory for a bacteriologist to assist in making examinations. Such service will be free. All the expenses incurred by the visit must, however, be borne by the community for which the work is done.

The Board has made provision to secure a large number of *diphtheria*, *typhoid* and *tuberculosis diagnosis outfits* which will be constantly kept on hand at *culture stations* in every community in the state. These *culture stations* will be certain drug stores or other readily accessible public places chosen for that purpose by the local health officer with the concurrence of the director of the laboratory. Such stations will serve the community and physicians gratuitously. Physicians should not keep up a supply of the outfits on hand but may secure them from the *culture station* whenever needed. The number of outfits constantly kept at each *culture station* will be limited, except in cases of an epidemic when a large number will be placed at their disposal.

Every *culture station* will be provided with a *record book* in which the physician is requested to record the date and number of every outfit taken by him. These diagnosis outfits will be supplied free of charge. Physicians must pay postage on all *typhoid* outfits and prepay express charges on all *diphtheria* and *tuberculosis* outfits when sending them to the laboratory. An order on the part of the U. S. postoffice department prohibits the sending of bacteriological specimens through the mail except in cases especially designated for that purpose. (See postal regulations Order No. 667. Approved by the Postmaster General Dec. 27, 1897.) These cases are very bulky and cannot well be used for the purpose in this laboratory.

Every outfit furnished contains the apparatus necessary for the collection of the material, to be examined:—namely, test tubes, with media and swabs for diphtheria, foil and wire loop for typhoid, and a bottle for tuberculosis. Directions for the collection of such material will be found

In each outfit, also a *data-card* which the physician is required to fill out in order that such statistics may be gathered as will be of service to the laboratory in making reports to the State Board of Health, in becoming informed concerning the real status of the disease in this state and to medical science in that the statistics will be of great value in gaining a greater comprehension of the disease concerned. A brief note concerning the value of bacteriological laboratory methods in the diagnosis of diphtheria, typhoid fever and tuberculosis will also be included in the respective outfits.

When the material has been gathered and the *data-card* properly filled out, the outfit is sent to the laboratory as already noted. All examinations will be made without delay. Diphtheria examinations will be given preference in point of time over all other work of the laboratory. The report of all examinations will be sent by mail as soon as the examination is made. If requested to do so a telegraphic report is sent at the physician's expense. The mailed report will contain a special interpretation of the diagnosis as given.

Whenever a positive diagnosis of a specimen is made by a bacteriologist of the State Board of Health Laboratory, the physician must report same immediately to the local Board of Health of the community in which the case exists.

Whenever material is to be examined in connection with *rabies*, the local Board of Health is requested to correspond with the director of the laboratory for special instructions in regard to the sending of the material. The animal should *not* be killed.

All special communications concerning the work of the Laboratory should be addressed to Dr. Henry Albert, Director Iowa State Board of Health Bacteriological Laboratory, Iowa City, Ia. Please avoid all unnecessary correspondence.

All communications concerning Rules and Regulations of the State Board of Health should be addressed to the Secretary Iowa State Board of Health, Des Moines, Iowa.

We trust that the members of the medical profession in Iowa will not only avail themselves of the privileges offered by the Laboratory but will co-operate in every way with the State Board of Health in order that the public health may at all times be safeguarded.

In establishing the culture stations, the director sent the following letter (printed form) to the health officers of every city and town of this state:

IOWA CITY, IOWA.....

DR.....

....., Ia.,

DEAR DOCTOR:

You are doubtless aware of the provision, made by the last general assembly, for the establishment of a State Board of Health Laboratory in connection with the department of Bacteriology of the State University

of Iowa at Iowa City. The plans for the work of the Laboratory have now been formulated and the laboratory will soon be in a position to begin work.

The scope of the work of the laboratory and other information regarding it has been printed in a "Circular of Information concerning the Iowa State Board of Health Bacteriological Laboratory" a copy of which you will find enclosed. A copy of this circular will also be sent to every physician in the state.

In order that the privileges of the laboratory may be made most accessible to every physician of the State, the Board of Health has decided to establish *culture stations* in every city and town, where typhoid, diphtheria and tuberculosis outfits are to be constantly kept on hand and at the service of every physician who complies with the regulations of the State Board of Health. The Board requests that every local health officer secure some drug store or other public place as a *culture station*. We believe that from a business standpoint, any drug store will serve as such gratuitously.

There is to be but one *culture station* in a city of less than 10,000 population. In cities with a population of more than 10,000, there may be more than one *culture station* as the health officer may deem best, but in no instance is there to be more than one *culture station* for every 10,000 population and fraction thereof.

As local health officer in your community, you are requested to select the *culture station* for your city or town, and to recommend the appointment of such to the director of the State Board of Health Bacteriological Laboratory—Dr. Henry Albert, Iowa City, Iowa. Kindly do this immediately.

We trust that we may receive the hearty co-operation of every local health officer in order that the work of the State Board of Health Laboratory may be made as efficient as possible; that vital statistics may be accurately collected, so that the Board of Health may at all times be kept well informed concerning the status of the health of the people of this State.

Very sincerely yours,

HENRY ALBERT,

Director, Iowa State Board of Health Bacteriological Laboratory.

At the same time inclosing the following circular, which the health officer used in making his recommendation:

.....Iowa.....190...

DR. HENRY ALBERT,

Director, Iowa State Board of Health Laboratory, Iowa City, Iowa.

DEAR SIR:—

I recommend that Mr.....be made a special agent of the Iowa State Board of Health and that his place of business, abe made a *culture station* of the Iowa State Board of Health Bacteriological Laboratory.

Yours truly,

.....M. D.

On receiving the name of the druggist recommended by the health officer, the following letter (in printed form) was sent to the person recommended:

IOWA CITY, IOWA.....190...

Mr.

DEAR SIR:—

The local health officer of your community, Dr. has recommended to the director of the Iowa State Board of Health Laboratory that you be appointed as the special agent of that Board and that your place of business be made a *culture station* of the State Board of Health Bacteriological Laboratory.

Each *culture station* is supposed to keep on hand at the service of every physician who complies with the rules and regulations of the State Board of Health, outfits for the diagnosis of diphtheria, typhoid fever and tuberculosis, but not to exceed in number one of each of the outfits to every two hundred population of the city or town concerned except under special circumstances as in case of epidemics, when as many as necessary should be kept on hand. Whenever requested by a "culture station," the director of the laboratory will send to the station such outfits as requested, by express prepaid. Whenever ten or more of the "diphtheria outfits" at the "culture station" become useless because of the media becoming dried or contaminated, such stations are requested to return the "outfits" to the laboratory, the express to be paid by the laboratory. Every *culture station* will be provided with a "requisition blank" to be used in ordering outfits from the laboratory and a "record book" in which every physician is to record the kind and number of the outfits taken by him. These outfits are to be supplied free of charge to all physicians. Physicians are not supposed to keep a supply of them on hand but to get them from the *culture station* whenever desired.

Every *culture station* special agent will serve in such capacity gratuitously. There is to be but one "culture station" in cities with a population of 10,000 or less. In cities with a population of more than 10,000 there may be more than one *culture station* as the local Board of Health may deem best but in no instance is there to be more than one *culture station* for every 10,000 population and fraction thereof. In cities where there is to be more than one *culture station* the local Board of Health is to divide the city into *culture station* districts, each of which is to have a *culture station* which shall keep on hand a supply of outfits in proportion to the population of that district. Any physician of the city, may, however secure outfits from any of the *culture stations*. From time to time the director may request the "special agent" at the *culture station* to account for any outfits that have not been returned to the laboratory. The agent will present the names of physicians who have taken such outfits from the *culture station*.

Will you please indicate your willingness to serve in such capacity, your tenure of office being at the pleasure of the director of the laboratory, subject to the concurrence of the State Board of Health. If you decide to act as such, I will immediately send you order sheets, to be used by you in ordering diagnosis outfits from the laboratory.

Very truly yours,

HENRY ALBERT,

Director, Iowa State Board of Health Laboratory.

The special agent of the laboratory on expressing his willingness to permit his place of business to serve as a culture station of the laboratory, is immediately supplied with the necessary diagnosis outfits, sent by express prepaid, and the physicians of that city are immediately notified that they may now secure their diagnosis outfits from the culture stations free of charge. The following slip is used in notifying the physicians:

The Culture Stations of your city are:

No material will be examined in the State Board of Health Bacteriological Laboratory unless sent in the outfits provided for that purpose.

The special outfits with which the culture stations were supplied were for the diagnosis of tuberculosis, diphtheria and typhoid fever respectively:

TUBERCULOSIS: The diagnosis outfits consist of a glass bottle, corkstoppered of about four dram capacity, containing one dram of a five per cent solution of carbolic acid. This is placed in a wooden, screw-top case, upon which is the address of the laboratory. Inclosed in the case is a card to be filled out in part by the physician and in part at the laboratory. The card is printed on both sides as follows:

A.—Front of card.

To be filled out by physicians only (See also other side.)	To be filled out at Laboratory only.
Patient's name	Case No.
Address	Diagnosis
Physician's name	Received
Address	Reported
Health Officer's name	Examined by
Address	Notes

Date of collecting sputum—Year.....Month.....Day of Month.....Hour
.....a. m..... p. m.
No. of Specimen, whether 1st, 2d, 3d, etc.... Date of earliest symptoms...
Patient's age Sex..... Color..... Nationality.....
Occupation Married or single.....
Is patient working? If so, where and what?.....

B.—Back of card.

(TO BE FILLED OUT BY THE PHYSICIAN ONLY; SEE OTHER SIDE ALSO)

No. in family.....How many, if any other cases of tuberculosis in the family

Relation to patient and date of last case.....

Symptoms:—Cough.....Expectoration, amount and character of.....

Night sweatHemorrhage.....Emaciation.....

Temperature Pulse.....Respiration.....

Physical signs:..Consolidation?..... Cavities.....Rates.....

Ever have pleurisy?Joint disease?.....Enlarged Glands?.....

Clinical diagnosis

Remarks

(Please fill out both sides of card, as indicated for every specimen sent)

IOWA STATE BOARD OF HEALTH, BACTERIOLOGICAL LABORATORY

(University of Iowa) Iowa City, Iowa

The outfit also contains a small circular which on one side contains the following:

IOWA STATE BOARD OF HEALTH BACTERIOLOGICAL LABORATORY

(University of Iowa) Iowa City, Iowa

Directions for Collecting Sputum from Suspected Cases of Tuberculosis

*SPECIMENS WILL NOT BE ACCEPTED UNLESS SUBMITTED IN THE BOTTLES PROVIDED FOR THE PURPOSE BY THE LABORATORY.

SPECIMENS WILL NOT BE EXAMINED IF THERE IS ANY SPUTUM ON THE OUTSIDE OF THE BOTTLE.

The sputum coughed up in the morning before breakfast is to be preferred. If the sputum be scanty, the entire amount expectorated in twenty-four hours should be collected. Care should be taken that the contents of the stomach, articles of food, etc., are not ejected during the act of coughing and collected instead of the pulmonary sputum. Purulent, cheesy and mucopurulent sputum most frequently contain the bacilli; pure mucus, blood or saliva does not as a rule contain them. Patient should be told to deposit results of coughing in the specimen bottle, and not merely to spit in the vessel. When hemorrhage has occurred, some purulent, cheesy or muco-purulent sputum should, if possible be collected for the examination.

*These rules have been adopted because the examination of Tuberculous sputum entails some danger to the examiner, if indiscriminate outfits are used or if the material is carelessly collected.

PATIENTS SHOULD TOUCH BOTTLE AND CORK AS LITTLE AS POSSIBLE. Be VERY SURE THAT PATIENT DOES NOT PERMIT SPUTUM TO COME IN CONTACT WITH OUTSIDE OF BOTTLE OR CORK.

Physicians must fill out *data* card completely. The information thus received is solely for registration, and the cases so reported are not visited by any health officer unless requested to do so by the attending physician.

The sputum bottle with *data* card (filled out) is placed in the wooden case and sent to the laboratory by express prepaid. Postal regulations prohibit the sending of this case through the mail.

The report will be forwarded by mail the day after the specimen is received.

And on the other side:

THE DIAGNOSIS OF TUBERCULOSIS

The successful treatment of tuberculosis and the best method of preventing the spread of this disease depends to a very large extent upon an early diagnosis.

The finding of the tubercle bacilli (Koch's bacilli) in the sputum of an individual is the surest method of making a positive diagnosis of pulmonary tuberculosis. Not infrequently it is impossible to diagnosis a suspected case until these bacilli have been discovered or excluded by repeated bacteriological examinations. Although the presence of tubercle bacilli in the sputum is always indicative of more or less destruction of tissue or the softening of some tuberculous focus, yet it is frequently the first evidence of the disease process, appearing often before there is any evidence of consolidation or formation of cavities. We recommend, therefore, that physicians avail themselves of the opportunity afforded by the State Board of Health Bacteriological Laboratory, to assist them in making an early and positive diagnosis of tuberculosis. We would remind the physician, however, that he should not place too much reliance upon a negative report. The absence of tubercle bacilli or the failure to find them microscopically does not necessarily exclude the existence of the disease, since the case may be in the incipient stage when a very few tubercle bacilli are present, or the sputum may not at just that time contain the bacilli, or the portion of the sputum examined may not contain them. The physician should, therefore, avail himself of every method of physical and other means of diagnosis and if the diagnosis of tuberculosis is still suspected clinically, even after repeated negative reports have been given him by the laboratory, the case should be treated as one of tuberculosis and the necessary precautionary measures instituted.

Since these examinations are not made simply as a convenience to the physician to assist him in making a diagnosis, but also in order that the State Board of Health may be informed of the status of this disease in

Iowa, no examination will be made unless the accompanying data blank is completely filled out by the physician.

When the specimen of sputum is received at the laboratory it is immediately examined and the report sent on the same day the specimen was received (Sundays and holidays excepted). A report giving the result of the examination is sent by mail on a circular form, which reads on one side as follows:

IOWA STATE BOARD OF HEALTH BACTERIOLOGICAL LABORATORY.

(University of Iowa) Iowa City, Iowa

IOWA CITY, IOWA,190...

Dr.

....., Iowa

Dear Doctor:—

The specimen of sputum No. from submitted to you yesterday has been examined.

Report (See other side)

Remarks

.....Bacteriologist.

HENRY ALBERT, M. D.,

Director.

(All cases of tuberculosis must be reported to the local Board of Health in accordance with the rules and regulations of the State Board of Health.)

And on the other side:

IOWA STATE BOARD OF HEALTH, BACTERIOLOGICAL LABORATORY

(University of Iowa) Iowa City, Iowa

INTERPRETATION OF REPORT

1. *Tubercle bacilli present* means that a tuberculosis lesion exists. The following modifying expressions are used:—

Few—signifies that the bacilli are not present in every field, and but a small number in the entire preparation.

Moderate Number signifies that the bacilli are present in every field, but that each field (oil immersion) contains less than five bacilli.

Numerous signifies that the bacilli are present in every field and that each field contains more than five bacilli.

2. *No tubercle bacilli found* means:—

(a) That no tuberculosis exists, or,

(b) That the case is in the incipient stage, when very few tubercle bacilli are present in the sputum (as a rule), or,

(c) That just at this time, even though the case be well marked pulmonary, very few, if any, tubercle bacilli are in the sputum, although they may have been present at an earlier period and may reappear again later, or,

(d) That the particular portion of sputum examined did not contain the tubercle bacilli, although they may have been present in another portion. If directions are followed in collecting sputum, this source of error is practically eliminated, or,

(e) Error in collecting sputum—may be too much mucus, saliva, food, etc.

It should be constantly remembered that the demonstration of the presence of tubercle bacilli in the sputum proves conclusively the existence of tuberculosis; but that the absence of tubercle bacilli or the failure to find them microscopically does not positively exclude the existence of the disease.

Whenever a negative report is received and the case is still regarded clinically as tuberculosis, other specimens should be sent for examination. Meanwhile patient should be regarded as affected with tuberculosis.

Whenever a positive report is given the following is included with the report which the physician is requested to give the patient or the guardian of the patient or they should be informed of its contents:

CIRCULAR OF INFORMATION

FOR CONSUMPTIVES AND THOSE LIVING WITH THEM

Consumption or tuberculosis is caused by the bacillus of tuberculosis, a particular kind of germ. This germ grows in the lungs of the consumptive patient in enormous numbers, and the material (called sputum or spit) coughed up by the patient contains a great many of them. When this sputum is allowed to dry in the room or on the street it may become powdered and be blown about in the air. People breathing this air may take the germs into their lungs and after a time become consumptive.

This is the first danger to be guarded against. The patient should not spit upon the floor, carpet, wall, stove, sidewalk, street, or anywhere except in a receptacle kept for the purpose. If a cup is used it should be one-third full of water and carbolic acid (Solution I., see below). The water keeps the sputum moist and the carbolic acid kills the germs. The cup should be emptied into the water-closet twice a day and carefully washed afterwards each time with carbolic acid (Solution I.) followed by boiling water.

In the house, the best plan is to use a paste-board or paper cup, which should set in a china or metallic holder as represented in the cut. No disinfectant solution is used. The cup with its contents should be



HOLDER FOR PASTEBOARD CUP

burned and a new one substituted at least once a day; if the expectoration is considerable, much oftener. Cup and holder can be procured at the apothecaries.

Handkerchiefs used by the patient should be boiled for half an hour by themselves and then washed, each day. It is better to use worthless cloths and burn them, instead of boiling and washing. When away from home, the patient may spit into the cloths, which should not be carried loose in the pocket, but in a tobacco pouch or other waterproof receptacle. On returning home, the cloths should be boiled or better burned, and the pouch well washed with carbolic acid and water (Solution I). Better than cloths is a pocket receptacle or pocket spitting flask or cup (see illustration above).

Great care should be taken by the patient to prevent the hands, face and clothing from becoming soiled with the sputum. The lips are particularly apt to become smeared with the sputum, and the hands also, when cloths are used. Both hands and face should be frequently washed with hot water and soap, followed by carbolic acid and water (see below, II.). The kissing of consumptive patients is dangerous, especially to children.

The second source of danger is in the fine spray thrown off by the patient from the mouth in coughing, laughing, sneezing, spitting, etc. The germs are present in this spray which floats about in the air and settles upon the furniture, carpet and other things. Proper precautions should accordingly be taken.

Although the danger from this source is not so great as from the dried sputum, nevertheless persons not having consumption run the risk of infection if they remain long in a room used by a consumptive patient. No tuberculosis patient should sleep in the same room with anyone else. There is little danger from the ordinary breath of a consumptive.

The third source of danger is from clothing and knives, forks, spoons, plates, cups, etc., used by the patient.

These should be boiled in water after use. The patient's clothing, night robes, sheets, pillow-slips, etc., should not be mixed with the general wash of the family, nor sent to a public laundry, but boiled for half an hour and then washed by themselves at home. Articles of food, especially milk, should not be used by the family after standing for any length of time in the room used by the patient.

Consumption is by no means always fatal and in the earlier stages recovery often takes place. The room occupied by the patient should be as large, airy and well lighted as possible. Carpets, curtains and upholstery should not be used. If already in use, they should be removed and disinfected. Floor rugs should be frequently taken up and exposed to sunlight for a day and then swept or beaten in the open air and at intervals disinfected with steam. They should not be swept or beaten in the house. The floors, woodwork, furniture, windows, etc., should be wired with a cloth moistened with a disinfectant solution—not swept or dusted. The bowl of the water-closet used by the patient should be washed each day with a disinfectant solution also. Male patients should not wear beard or moustache but should be clean shaved.

If these directions are followed, but little danger of infection to the family will exist and the patient will be in good circumstances for recovery. The patient should have nourishing food, plenty of fresh air and light, and occupation suited to the general conditions of the disease.

Fresh air is of the highest importance for tuberculous persons. Hot and stuffy rooms have an evil influence over the disease. Except in special circumstances, the bed-room window should be kept open by night as well as by day.

The patient should avoid swallowing the sputum, since it is very liable to produce tuberculosis of the intestine.

If the matter coughed up be properly destroyed, consumptives may frequently not only do their usual work without giving the disease to others, but may also improve their own condition and increase their chances of getting well.

Consumptive patients should abstain from excesses of all kinds, alcoholic, etc.

What is good for one consumptive is often not good for another. A patient's cure depends largely upon the faithfulness with which he carries out his physician's instructions.

Rooms which have been occupied by a consumptive should be thoroughly disinfected, scrubbed, whitewashed, painted or papered, before they are again occupied. Carpets, rugs, bedding, etc., from rooms which have been occupied by a consumptive, should be thoroughly disinfected.

DISINFECTANT SOLUTIONS

I. For sputum cups and washing furniture, woodwork, metal surfaces, floors, etc.:

Carbolic acid, half pint; Water, five quarts (label "poison").

II. For washing hands and face:

Mix one quart of Solution I. with one quart of water (label "poison").

III. For steam disinfection and disinfection of rooms:

Apply to your physician or local health officer.

DIPHTHERIA

The diagnosis outfits for diphtheria consist of a light wooden box divided into two parts by a wooden partition, each part containing a test tube. One contains sterile fluid covered with a rubber cap, the other contains two sterile cotton swabs. Every outfit also contains a small circular, the front of which has the following:

IOWA STATE BOARD OF HEALTH, BACTERIOLOGICAL LABORATORY
(University of Iowa) Iowa City, Iowa

DIPHTHERIA DIAGNOSIS

Directions for Making Culture

No local antiseptic application should be made for at least two hours previous to taking the culture.

1. Rub the swab gently but freely against any visible exudate or pseudo-membrane in the throat or nose, revolving the swab between the fingers in such a manner as to bring it thoroughly in contact with the suspected area. In the absence of exudate or when the exudate or pseudo-membrane cannot be reached as in some cases where it is confined to the larynx, pass the swab back as far as possible, avoiding the tongue, and rub it freely as above described over any inflamed mucous membrane which may be present.

2. Withdraw the cotton plug from the serum tube taking care that the portion of the plug which is to be replaced in the tube does not come in contact with the fingers or other substance.

3. Insert the infected swab into the serum tube and rub it gently but thoroughly back and forth over the entire surface of the serum, revolving the swab so as to bring it thoroughly in contact with the serum. Do not break the surface of the serum by pushing the swab through it. Care should be taken that the swab does not touch the mouth of either tube nor any object aside from those mentioned either before or after it has been used.

4. Replace the infected swab in its own tube, and replace the cotton plugs in their respective tubes.

5. Mark the serum-tube label with the patient's name. Pack the tubes securely, in the box so as to prevent breakage, enclose the accompanying data-card (filled out), wrap the whole in tough paper, tie firmly, and send at once to the laboratory.

Culture for diagnosis may be taken from any part of nose or throat part suspected of being infected.

Culture for release from quarantine must be taken from both nose and throat in all cases, that is, a culture of the throat for release must always be accompanied by a culture from the nose and vice versa. Use one of the two swabs for the nose, and the other for the throat rubbing both swabs on the same serum.

And the back, the following note:

THE DIAGNOSIS OF DIPHTHERIA

Diphtheria is due to the presence of diphtheria bacilli (Klebs-Loeffler bacilli) which are especially present in the membranous covering (false or pseudo-membrane) of the affected area.

The bacteriological examination with clinical data is the only reliable method of making a diagnosis of diphtheria. The clinical diagnosis is not always reliable because:—

1. There are certain pseudo-membranous inflammatory processes of the throat clinically indistinguishable from diphtheria not due to the presence of the diphtheria bacilli but due to other micro-organisms as streptococci, etc. (false or pseudo-diphtheria).

2. There are mild cases of sore throat, apparently simple pharyngitis, tonsillitis, etc., which on bacteriological examination prove to be true diphtheria. They are danger to the public and ought to be quarantined.

Again in a very small percentage of cases, diphtheria bacilli are present in the throats of individuals in whom no evidence of the disease exists. Such individuals may transfer the disease to others and ought to be isolated until it has been proven that the organisms present are non-virulent.

Physicians are requested to avail themselves of the opportunity afforded by the State Board of Health Bacteriological Laboratory in assisting them in making an early diagnosis of all cases of diphtheria; in establishing the period of quarantine and in diminishing the number of cases of diphtheria in the State.

The diagnosis of diphtheria, being a matter of special importance in regard to the treatment of the patient—these examinations are given precedence in point of time to all other work in the laboratory.

An incubation, at body temperature, of from five to twelve hours is necessary before a proper examination can be made.

If the culture is received in the morning an examination is made and a report sent by mail or telegraph (as the physician may desire) that same day. This applies only to cultures for diagnosis; culture for release from quarantine will be reported on the day following the receipt of the culture at the laboratory.

If the case appears to be diphtheria, clinically, physicians are requested not to wait for the laboratory report but to administer the antitoxin immediately and to isolate the patient.

All cases are reported by mail. If specially requested to do so a report is also sent by telegraph at the physician's expense.

The outfit also contains a card the front of which is as follows:

DIPHTHERIA

To be filled out by physician only (See also other side.)	To be filled out at Laboratory only.
Patient's name	Case No. Report, mail—telegraph
Address	Diagnosis
Physician's name	Received
Address	Reported
Health Officer's name	Examined by
Address	Notes

Shall report be sent by mail or telegraph?..... (Telegraphic reports are at physician's expense.)

Date of culture—Year.....Month.....Day of Month.....Hour.....a. m.p. m.
No. of culture from the patient, whether 1st, 2d, 3d, etc.....For diagnosis
or Release

Culture from nose or throat or both..... (Release culture must be from both nose and throat.)

Age.....Sex.....Occupation.....Married
or Single.....How long since disease commenced?.....

.....What is suspected source of infection?.....

If child, what school has he or she been attending?.....

.....How many other cases of diphtheria
(if any) in the house?.....

and the back is as follows:

(To be Filled out by the Physician only: See other side also.)

Membrane present.....Nares.....Pharynx.....Tonsils.....Larynx.....

Exudate present.....Nares.....Pharynx.....Tonsils.....Larynx.....

If no membrane or exudate exists, state site of inflammation.....

How long since an antiseptic was used in the throat.....Pulse.....

Temperature.....Respiration.....

Constitutional symptoms

Has antitoxin been used? How much and when?.....

Clinical Diagnosis

Remarks

(Please fill out both sides of card, as indicated for every preparation made.)

A small circular is pasted on the cover of the box, as follows:
IOWA STATE BOARD OF HEALTH, BACTERIOLOGICAL LABORATORY
(University of Iowa) Iowa City, Iowa

DIPHTHERIA OUTFIT

Examine this outfit without removing rubber caps from tube before taking it from culture station and if the serum is dry, liquefied or otherwise contaminated, it should not be used. Condensation water or bubbles in the serum do not affect the utility of the outfit.

Please sign for outfit (date, No. and your name) before taking it from station.

Postal regulations forbid the return of this box my mail. SEND BY EXPRESS PREPAID.

When the diphtheria diagnosis outfits are received at the laboratory, the tubes which have been inoculated are placed in the incubator for from six to twelve hours when a microscopical examination is made of the growth of the media. The report of the result of the examination is immediately sent by mail. If the physician requests it an additional report is sent by telegraph at the physician's expense. In reporting to the local physicians the telephone is often used. The report is sent on a printed form the front of which is as follows:

IOWA STATE BOARD OF HEALTH, BACTERIOLOGICAL LABORATORY
(University of Iowa) Iowa City, Iowa

Iowa City, Iowa.....

Dr., Iowa.

Dear Doctor:—

The culture No.....form
submitted by you today—yesterday has been examined.

Diagnosis:..... (see other side)

Special remarks

Examined by.....

HENRY ALBERT, M. D.,
Director.

(Every case of Diphtheria must be reported to the local Board of Health.)

The back contains the following:

INTERPRETATION OF DIAGNOSIS GIVEN

1. DIPHTHERIA BACILLI PRESENT, indicates that:
 - (a) The patient has diphtheria or has recently had it, or,
 - (b) The diphtheria bacilli are present, even though no lesions of the disease exists as occasionally occurs especially among nurses. Such individuals are capable of spreading the disease.

2. NO DIPHtheria BACILLI FOUND, indicates:

- (a) The entire absence of diphtheria bacilli, or,
 (b) That the culture was not properly made, due either to improper technique in applying swab to the throat or in smearing the swab over the surface of the medium. (Please carefully follow the instructions), or,
 (c) That some antiseptic was applied to the throat shortly before taking the specimen. It interferes with the subsequent development of the bacteria, or,
 (d) That the infection was in the larynx and the swab may not have touched the membrane, or,
 (e) That it is one of the rare cases where only a very few diphtheria bacilli are present at the beginning, and may have escaped observation when making the examination. More will be present in a later culture.

If there is any doubt about the case send us another specimen.

3. QUESTIONABLE may mean—

- (a) That no growth developed on the media, or,
 (b) That the growth was so scanty that no diagnosis could be made, or,
 (c) That culture media was not in proper condition—too dry or contaminated. Such media should not be used.

When specimen is labeled "questionable" it will be examined the following day. If diphtheria bacilli are found you will be notified at once; if it is negative, no report will be sent. But do not wait—send another specimen immediately, if you deem advisable.

TYPHOID FEVER

Examinations for typhoid fever are made by the Widal method. The outfit consists of a small piece of aluminum foil, a small looped aluminum wire, a card and directions, all inclosed in an envelope which contains the address of the Director and the Laboratory. The aluminum wire is for collecting the blood, the aluminum foil for inclosing the dry blood, so that it can be sent to the laboratory. The front of the card is as follows:

TYPHOID FEVER

To be filled out by physician only (See other side also.)	To be filled out at Laboratory only.
Patient's name	Case No. (1-)
Address	Reaction
Physician's name	Received
Address	Reported
Health Officer's name	Examined by
Address	Report sent by mail-telegram
	Notes

Shall report be sent by mail or telegraph? (Telegraph reports are at physician's expense.)

Date of taking blood—Year.....Month.....Day of Month.....Hour.....
 a. m. p. m.

Has this case been reported on before? If so, when?.....
 When, if ever before, has patient had typhoid fever?.....
 How long since the disease commenced?.....
 What is the suspected source of infection?.....
 Source of water principally used by patient.....milk.....
 Sanitary condition of locality and house.....

The back is as follows:

(To be Filled out by the Physician only: See other side also)

Patient's age....Sex....Color....Occupation.....Married or single....
 Has patient been outside of his place of residence during the month previous to his illness? If so, where?.....How many, if any, of the other members of the family or household have, or have recently had typhoid fever?.....
 Symptoms:—Diarrhea.....Constipation.....Bloody Stools.....
 Spleen enlarged.....Rose Spots.....Iliac tenderness.....
 Headache.....Tongue.....Delirium.....Epistaxis.....
 Pulse.....Temperature.....Respiration.....
 Pulmonary symptoms.....
 Clinical Diagnosis.....
 Remarks:—Presence of jaundice, etc.....
 (Please fill out both sides of card, as indicated for every preparation made.)

The front of the inclosed circular is as follows:

IOWA STATE BOARD OF HEALTH, BACTERIOLOGICAL LABORATORY

(University of Iowa) Iowa City, Iowa

METHOD TO BE FOLLOWED IN COLLECTING BLOOD FOR THE SERUM DIAGNOSIS OF TYPHOID FEVER

To secure a reliable reaction with dried blood, it is essential that a rather large amount of blood be collected in as cleanly a manner as possible. Hence the following directions should be carefully observed:—

Wash with boiled water the part from which the blood is to be obtained (the lob of the ear, end of the finger, or toe of an infant). Prick deeply the skin with a needle or scalpel. Remove four or five loopfuls of blood with the wire loop in outfit, placing each by itself on the aluminum square enclosed. ALLOW THE BLOOD TO DRY, then make a tight packet of the foil by folding and turning over each end. Place foil and data blank (filled out) in envelope and mail to the Laboratory.

The back contains the following:
IOWA STATE BOARD OF HEALTH, BACTERIOLOGICAL LABORATORY

(University of Iowa) Iowa City, Iowa

The serum test (Widal test) for typhoid fever is made by adding typhoid bacilli from a fresh culture to a certain dilution of blood or serum from suspected cases. The dilution chosen is usually one to twenty, one to fifty and one to one hundred.

When the typhoid bacilli become agglutinated or clumped into masses and their motility wholly checked, the reaction is considered positive.

A positive reaction indicates either that the patient yielding the blood is suffering with typhoid fever or has recently recovered from it, or has some localized affection in which typhoid bacilli are present (osteomyelitis, pleurisy, etc.).

A negative reaction is sometimes associated throughout with well-marked cases of typhoid fever, but such cases are rare (perhaps about 2%). A negative reaction in most cases signifies either that the disease is not typhoid fever, or else that it is not yet sufficiently advanced to yield a positive reaction. The reaction usually appears about the end of the first week and rarely is delayed beyond the second week.

In as much as typhoid patients may discharge typhoid bacilli in feces and urine even after convalescence and thereby endanger the health of individuals and communities, the Board urgently advises physicians who are in doubt of the clinical diagnosis to avail themselves of the facilities offered for increasing the certainty of the diagnosis by sending to the Laboratory, specimens of blood—if necessary, repeatedly—in order that the proper precaution may be taken to locate sources of infection and to prevent the dissemination of typhoid bacilli.

A report will be mailed on the day of the receipt of the preparation if received in the forenoon; the day after, if received in the afternoon. If requested a telegraphic report will be sent at the physician's expense. The report will always be sent by mail, whether a telegraphic report has been sent or not.

Examinations of the specimens are made on the same day they are received. The report is made on a printed form, the front of which is as follows:

IOWA STATE BOARD OF HEALTH, BACTERIOLOGICAL LABORATORY

(University of Iowa) Iowa City, Iowa.

Iowa City, Iowa.

Dr., Iowa.

Dear Doctor:—

The blood preparation No. from submitted by you today—yesterday for the serum reaction for typhoid fever, has been examined.

Reaction (See other side)

Remarks:

Examined by HENRY ALBERT, M. D.,

Director.

(All cases of typhoid fever must be reported to the local Board of Health)

INTERPRETATION OF REACTION AS GIVEN

Reaction Present—means that blood serum diluted, ten to fifty or more times has the property of clumping and arresting the motility or typhoid bacilli, added to it from a fresh culture. This indicates:

(a) The patient is now or recently has been infected with *B. typhosus*. In over 90% of cases the patient has enteric or typhoid fever. Reaction may, however, be due to some obscure infection with the typhoid bacillus e. g. osteomyelitis, abscess, meningitis, pneumonia, pleurisy, etc.

(b) Reaction infrequently persists from an old typhoid infection.

Reaction Absent—indicates:

(a) Absence of typhoid infection, or,

(b) That it is too early in the disease for the appearance of the reaction. (Usually in cases of typhoid, the reaction is present by the end of the first week and rarely it is delayed beyond the second), or,

(c) In about 2% of all cases of typhoid, no reaction appears at any time in the disease (further investigation may show that this 2% represents cases of paratyphoid, etc., and not cases of real typhoid). With our present knowledge therefore, the absence of the reaction in any individual case does not positively exclude the diagnosis of typhoid fever.

Reaction Questionable—indicates:

(a) Typhoid infection too recent to produce typical reaction, or,

(b) Error in collecting blood, directions not having been properly followed.

In all cases where the reaction is *absent* or *questionable* you are requested to send subsequent specimens for examination—as long as you remain in any doubt as to the diagnosis.

All cases of typhoid infection should be regarded as dangerous to the public health. Physicians are urged to take every precaution in the instruction of attendants, etc. Circulars of information dealing with the matter will be furnished on application to Dr. J. F. Kennedy, Secretary of the Iowa State Board of Health, Des Moines, Iowa.

During the past year (Sept. 1904-05) 3,560 examinations were made in the Laboratory. Of these 1,415 were made for the detection of the diphtheria bacillus; 1,531 sputum examinations for the tubercle bacilli; 495 Widal examinations for typhoid fever; and, 133 miscellaneous.

DIPHTHERIA—Of the 1,415 examinations for the presence of the diphtheria bacillus 496 were positive and 919 negative.

TUBERCULOSIS—Of the 1,531 examinations for the presence of the tubercle bacilli, 624 were positive and 1,007 negative.

TYPHOID FEVER—Of the 495 Widal examinations for typhoid fever, 127 were positive, 228 were negative and 40 questionable.

MISCELLANEOUS—The following miscellaneous specimens were examined:

	Positive	Negative
Actinomyces	2	1
Malaria	3	1
Gonococcus	11	13
Gonorrhoea	2	5
Streptococcus	0	2
Ringworm	0	1
Urine	7	18
Rabies	1	3
Blood counting	0	1
Pus	12	11
Abscess	1	1
Pneumococcus	2	1
Cerebro-Spinal-M.	1	2
Meat	0	1
Cocci	2	1
Lupus	0	1
Milk	0	5
Feces	0	3
Pleural Fluid	0	3
Cheese	0	1
Fungus	1	0
Tbc. Liver-swine	0	1
Tbc. lung-swine	0	1
Tbc. Mammar-swine	0	2
Tbc. sub-max-g. swine	0	1
Actinomyces-swine	0	2
Actinomyces Bovine	0	1
Tbc. Gland Bovine	0	1
Tbs. Mamma. Bovine	0	1
Water	3	13

46 81—10.

Total.....139

During the year (July 1905-1906) 5199 examinations were made in the laboratory. Of these 2251 were made for diphtheria, 628 for typhoid fever, 2032 for tuberculosis, and 288 miscellaneous.

DIPHTHERIA—Of the 2251 examinations made for diphtheria 1184 were made for diagnosis, of which 425 were positive, 757 negative and 2 questionable; and 1067 were made for release from quarantine, of which 283 were positive and 784 negative.

TUBERCULOSIS—Of the 2032 examinations for the tubercle bacilli, 587 were positive, and 1445 negative.

TYPHOID FEVER—Of the 628 made for typhoid fever, 159 were positive, 422 negative and 47 questionable.

MISCELLANEOUS—The following miscellaneous specimens were examined:—(118 positive, 169 negative, and 1 questionable).

	Positive	Negative	Questionable
Actinomyces	2	3	
Gonococcus	12	11	
Urine	21	20	1
Rabies		1	
Blood	4	3	
Pus	10	21	
Pneumococcus	1		
Cerebro-spinal Men.		1	
Meat	2	2	
Milk	4	33	
Feces	7	8	
Pleural Fluid		1	
Tonsil		1	
Vomit	1		
Jaw	1		
Gland	4	1	
Pyosalpinx	1		
Tissue	5	5	
Sewage	5		
Effluent	2		
Germs	2		
Appendix	1		
Blastomycetes	2		
Membrane	1		
Anthrax		1	
Leukemia		1	
Scrapings		3	
Stomach		2	
Water	29	51	
Total	118	169	1

It will be noted that the number of routine examinations made in the laboratory has rapidly increased being 3,580 the first year, and 5,199 the second year.

During the biennium, the laboratory has done a great deal of special work in addition to the routine work just noted. This special work has consisted of investigation of typhoid fever epidemics, water and sewage analyses, experiments with disinfectants, car sanitation, etc.

Typhoid fever, epidemic investigations were made at Marion, Parkersburg, Burlington, Vinton, Estherville, Griswold and the Institute for Feeble-minded children in Glenwood. The reports made in connection with the more important of these examinations are as follows:

MARION: An examination was made on the 28th of March, 1905. The following is the report sent:

April 8, 1905.

Mr. Marshal, the mayor, and Dr. F. L. Sargeant, the health officer,
Marion, Iowa.

GENTLEMEN: We herewith send you our official report of the result of our investigations and examinations of the samples of milk and water collected in your city on March 28, 1905, in response to a request from your local board of health.

Six samples of milk and one of water were taken from the following sources:

- | | | |
|---|---------|-----------|
| (1) Mr. Patterson's own milk | ..... | 2 samples |
| (2) " Blink's | " | 1 " |
| (3) " Beall's | " | 1 " |
| (4) " Sargeant's | " | 1 " |
| (5) " Stouffer's | " | 1 " |
| (6) City water taken from Mr. Patterson's
pipe | | 11 |

We made a thorough examination of all of these samples at the laboratory, but neither typhoid nor colon bacilli were found in any of them. In fact, nothing was isolated which would indicate that the cases of typhoid fever were due to the milk under investigation. The number of organisms present in some of these samples, however, was higher than it ought to be, and this may be due to the milk being older than the others or to its being kept at a higher temperature, or that the process of milking and keeping the vessels is not done in as careful a manner as it should be. From the results of the findings we consider ourselves justified in stating that the milk could not have been the source of the infection. We did not personally investigate all dairies, but we deem it fit to make the following recommendations, 1, that it is exceedingly important that all dairies should be kept as cleanly as possible; 2, All the vessels used should be well washed in boiling water; 3, milk should always be kept at a very cool temperature.

Respectfully submitted,
PAUL SHEKWANA,
First Asst. Bacteriologist.

Approved.

HENRY ALBERT,
Director, Board of Health Laboratory.

BURLINGTON: The following is the report sent from the laboratory:

Dr. Carl Stutsman, the health officer, and Dr. J. S. Castor, the mayor,
Burlington, Iowa.

GENTLEMEN: We herewith submit our official report concerning the investigation of typhoid conditions in your city and examination of various samples of water taken on the 12th of April, 1905.

At your request I came to your city for that purpose, and with the kind assistance of Dr. Stutsman I was able to collect six samples of water from the following sources.

- | | | |
|-----------------------------------|-------|----------|
| (1) City water | ..... | 1 sample |
| (2) River water passing over alum | ..... | 1 " |
| (3) Locust street spring | ..... | 1 " |
| (4) School house water | ..... | 1 " |
| (5) Mr. Willeford's well-water | ..... | 1 " |
| (6) Union Station water | ..... | 1 " |

I made a thorough examination of all these samples at the laboratory of the Iowa State Board of Health and the results are as follows.

- | | | |
|--|-------|------------------------|
| (1) City water gave | ..... | 205 colonies per C. C. |
| (2) River water gave | ..... | 2730 " " " |
| (3) Locust St. Spring gave | ..... | 212 " " " |
| (4) School house water gave | ..... | 192 " " " |
| (5) Mr. Willeford's well water
gave | | 330 " " " |
| (6) Union Station water gave | ..... | 710 " " " |

From the above statistics, it is seen, as might be expected that the river-water gave the greatest number of colonies and also a great deal of deposit after standing. The sample which gave the next greatest number of colonies and deposit was that from the Union Station. The third with a great number of colonies was that from Mr. Willeford's well, though in this, there was practically no deposit or very little. None of these samples, except that from the river, gave an extremely high number of colonies, but at the same time all have numbers of colonies higher than the standard of a good drinking water. This higher number of colonies than the usual standard of good drinking water, is however excusable when we consider that about 26 hours elapsed between the time of collecting two samples and the time of making the plate-cultures for the examination. The difference in the number of colonies between the river water, after passing over alum and the filtered water as supplied to the public is about 11 per cent. The quality of a good drinking water depends, however not only on the number of germs which it contains, but much more on the kind of germs that are found. In none of the samples under consideration were either typhoid or colon bacilli found. From the findings of the examination of the samples under consideration we are justified in stating that the cases of typhoid fever in your city are probably not due to the water.

We desire to suggest to the health authorities in Burlington that all cases of typhoid fever (as well as of the other diseases) be reported to the health officers as soon as possible. This will greatly assist in determining the source of an outbreak of any disease in the future, in which case the steps could be at once taken, and an investigation made. We would further suggest that steps be taken immediately to locate every case of typhoid fever in your city and to determine the source of the water and milk supply used by the patients during the past few months.

Respectfully submitted,
Approved: HENRY ALBERT, PAUL SHEKWANA,
Director, State Bacteriological Laboratory. Bacteriologist.

PAKERSBURG—The report is as follows:

Dr. A. O. Strout, Health Officer,
Parkersburg, Iowa.

11-13 '04.

Dear Sir:—

In response to your request I went to your city on the 2nd inst. and made an investigation of the conditions concerned with the outbreak of typhoid fever at that place, and beg leave to submit the following report:

With your assistance I made a thorough investigation of the sanitary conditions of the city and learned that the greater part of the city is supplied with city water—the people in the remainder using water from shallow wells most of which are situated as to render them liable to contamination with surface drainage. I also learned that there have recently been nine cases of typhoid fever in your city—all of which, with the exception of one case, occurred in one neighborhood—six in one family and one in another. All of these cases have been using water from shallow wells.

The city has no sewer system. Samples of water were collected from two wells belonging to families in which typhoid existed, from the city water taken from both the pumping station tap, and the tap in Dr. Strout's office. These samples were collected in the morning, packed in ice and immediately taken to Iowa City where they received a thorough bacteriological examination in the State Board of Health Laboratory. The result of the examination is as follows:

1. Samples of water taken from wells where typhoid existed: Both contained about 120 bacteria per cubic centimeter—neither typhoid nor colon bacilli were found.
2. City water taken from the two places mentioned contained on an average of 35 bacteria per cubic centimeter—neither typhoid nor colon bacilli were found.

From the investigation and examinations made I draw the following conclusions:

1. The source of the outbreak of typhoid cannot be definitely traced.
2. That neither typhoid nor colon bacilli were present in the water at the time when the samples were taken.
3. That the source of typhoid fever was apparently local not due to the use of the city water.
4. That at the present time the water which was examined is good for drinking and other domestic purposes.

In view of the investigation and examinations made, I offer the following recommendations:

1. That the city water should be extended to all parts of the city.
2. That the use of water from shallow wells should be discontinued since they are liable to become contaminated at any time.
3. That the streets and alleys should be kept in a cleanly and sanitary condition.
4. That the city should establish a sewer system as soon as possible.

In closing, I desire to thank you for the kind assistance given me while making the investigation and to heartily endorse your efforts in keeping your city and community in good sanitary condition.

Respectfully submitted,

Approved:

HENRY ALBERT,

Director, Iowa State Board of Health.

PAUL SHEKWANA,

Bacteriologist.

VINTON—The following report was submitted:

Sept. 26, 1905.

Mr. W. E. Klingaman, City Clerk,
Vinton, Iowa.

Dear Sir:—

We beg leave to submit the following report on the condition of your water supply as determined by a personal examination of your plant on the 16th of September, and examinations of a number of different samples of water and examinations to test the permeability of the soil in the neighborhood of the well which supplies a considerable amount of the water consumed by your city.

The sample of water taken from the artesian well proves to be exceptionally pure. The water taken directly from the river contained the contaminating substances usually found in river water. The samples of water taken from the shallow well near the river and the sample taken from the hydrant, both give about the same results. They contain about 400 bacteria per C. C., none of which indicated any undesirable contamination. The water as determined by the last examination was evidently considerably better on the 23d of Sept. than a week or two previous when previous examinations were made. If we were to judge from the last examination we would say it could be safely used for drinking purposes, even without boiling. Examinations to determine the safety of the water supplies should be made at different seasons of the year. A few weeks ago the water contained a large number of bacteria, many of which were undesirable and also contained a large amount of chlorine. As determined by a chemical analysis, and at the present time the water is considerably better, although it shows that your water is subject to variations which ought not to exist in a public supply. Whether or not the water from the shallow well will have been the cause of infectious diseases I cannot state. We know, nevertheless, that the water is subject to variations, being at sometimes in such a condition as not to be desirable for drinking purposes, if it has not previously been boiled. This fact together with the fact that the well is so situated as to make it possible that undesirable contamination may drain from the privy vaults in the neighborhood through the porous sand into his well are sufficient to indicate that the water from the shallow well is not the best source of water supply to be used for domestic purposes. The test of the permeability of the soil indicated that substances were passing quite rapidly through the particular soil in the neighborhood of this well, which means of course, that material from privy vaults will pass somewhat rapidly and for a longer distance through the particular soil which

you have in the neighborhood of the well than under ordinary conditions. It may be that drinking the water from your public supply has had nothing to do with any disease conditions that may have existed in your city. We believe, however, that it would be wise not to continue the use of the water from the well situated as is the one in your city and one which is so subject to variations in quality. We believe also that it is possible for you to secure a better source of supply. How best to secure that source, I am not prepared definitely to say—whether it be the making of another artesian well, or whether it be deep surface wells, or shallow surface wells in another situation. Such work comes more properly in the scope of a sanitary engineer, and we would recommend that you secure a sanitary engineer to investigate the condition and determine what may be done.

Very respectfully submitted,

Approved: HENRY ALBERT, Bacteriologist.
Director, Board of Health Bacteriological Laboratory

On looking over the literature of the subject, I am able to find but one reference to the isolation of this organism as the causative agent of a disease process (excluding experimental studies) in a body not that of the human being. The one instance referred to is the identification of this organism as the cause of an epidemic among cattle in Minnesota—reported in the Biennial Report of the Minnesota State Board of Health for 1898, page 180, and also by Wilson and Brimhall in the January, 1904, number of the American Veterinary Review (Vol. XXVII, No. 10, page 944.) That the specific form of cerebro-spinal meningitis occurring in cattle and man and caused by the same organism is one and the same disease there seems to me to be little doubt. That the micro-organism is transferable from the one to the other appears to me most probable, and that the organism may cause meningitis in animals other than the human being is an interesting fact to note. Whether or not the passage of the organism through animals has a tendency to increase its virulence; whether or not such has anything to do with the outbreaks of the disease in epidemic form and whether or not this factor is of importance in connection with the recent epidemics in the east, would be interesting to determine. The cases among cattle in Iowa do not seem to be associated with any cases among human beings. A few days ago we were informed that the epidemic among cattle is becoming more extensive. We shall continue our investigations as opportunity affords.

CEREBRO-SPINAL MENINGITIS.

On February 20, 1905, Dr. H. E. Talbot, a veterinary surgeon residing in Des Moines, sent to the laboratory parts of the brain of several cattle which he reported had died with symptoms suggesting cerebro-spinal meningitis. On bacteriological examination of the specimen a diplococcus which from its morphology, staining and cultural characteristics was found to be indistinguishable from the *Diplococcus intracellularis meningitidis* was found. A rabbit was inoculated beneath the dura mater with a pure culture of this micro-organism. The animal developed symptoms of cerebro-spinal meningitis within fifteen hours and died in thirty hours. At autopsy a small amount of a cerebro-fibrino-purulent exudate was found in the pia-arachnoid membrane. The

posterior half of the brain was found to be most extensively involved. The exudate contained quite a large number of diplococci many of which were found to be within the cells. A careful examination of the organism was made and again it was found to be indistinguishable from the *Diplococcus intracellularis meningitidis*. We conclude therefore that it was the same organism.

RABIES

During the past two years the laboratory has made examinations in a number of cases of suspected rabies, and in several cases found them to be positive. The laboratory is now employing a microscopical method of making a rapid diagnosis of rabies in addition to the long and tedious animal experiments. By the microscopical method a vast majority of cases can be diagnosed in several days after the material is received, whereas it requires from two to three weeks to determine by the animal experiment method. With the present knowledge at hand the animal experiments are still resorted to. It may be that the investigations of the next few years will demonstrate that a microscopical method alone is sufficient to determine the presence or absence of hydrophobia.

DISINFECTION EXPERIMENTS—To determine the relative merit of the various methods of disinfection in order that the many inquiries regarding the same might be properly answered and to determine the best method of disinfection for the good of the people of the state, a series of experiments were performed during the past two years.

A small room was prepared especially for this purpose, where all experiments would be absolutely controlled. In order to make conditions like those met with in ordinary practice, similar experiments were performed in rooms in the hospital and in private residences. As the result of our experimental work, one method of the liberation of formaldehyde gas seems to surpass all others—i. e. the liberation of formaldehyde by the addition of potassium permanganate to 40 per cent formalin. The chemical reaction which takes place is the changing of some of the formalin into formic acid by which process enough heat is produced to evaporate the remainder. The first experiments by the use of this method that are of scientific value were performed by the Maine State Board of Health in 1904. They were able to obtain the best results when two pints of a 40 per cent solution of formalin were added to thirteen ounces of potassium permanganate which had been ground to a rather fine powder for every 1000 cubic feet of room space. They obtained perfect results when this amount was used, even though no special attention was paid to cracks about doors and windows and the rooms were kept closed for but four hours.

Our experiments have been principally in the way of confirming the experiments of Maine and Vermont. In order to obtain better results, we have modified the method somewhat in the following directions. (1) The vessel from which the liberation of the formalin is to be made is first heated, this done we find that the liberation is more rapid

and the evaporation more thorough. (2) We find that it is very important that only strong formaldehyde should be used, we refer to this especially because much of the so-called formalin on the market at the present time contains no more than twenty-five or thirty per cent of formaldehyde. The results obtained are necessarily disappointing. (3) We find that it is necessary to use more of the potassium permanganate than recommended by the Maine State Board of Health, especially if these substances are used in small quantities as for the fumigation of a small room or closet.

The potassium permanganate should be in the form of very fine crystals or preferably in a powdered condition and is placed in the pail after it has been heated. There should be eight and one-half ounces of the potassium permanganate for every 1000 cubic feet of room space to be disinfected. (Maine State Board of Health recommended the use of thirteen ounces.) The solution of forty per cent formaldehyde (formalin) (20 ounces of this solution for every 1000 cubic feet of room space to be disinfected), (Maine State Board of Health recommended 32 ounces of formalin) is then added. Effervescence begins immediately. This method is, we believe, the one best adapted for general fumigation. The formaldehyde is liberated very rapidly, so that the method is very efficient and when rightly performed, reliable. A small amount of moist residue which has the odor of formaldehyde is always left in the bottom of the vessel. Twenty ounces of formalin are used for every 1000 cubic feet since there is a loss of about one-fifth of the amount during the process of evaporation. This means that about sixteen ounces of formalin becomes available in the gaseous state. If a low vessel is used, pieces of paper should be placed on the floor to prevent the floor from becoming soiled by some of the fluid being accidentally thrown out during the effervescing process. The method is simple, easy to perform, without any danger of fire and does sufficient work. We therefore most heartily recommend it.

CAR SANITATION

During the month of March arrangements were completed with several railroad companies, namely 1st, The Pullman Company, 2d, the Rock Island Company, and 3d, The Chicago, Burlington and Quincy, permitting representatives of the laboratory to make examinations of the air of railway coaches. Thus far examinations have been made only on the Pullman and Rock Island coaches. I have prepared special outline sheets, one of which is filled out for each examination. When a large number of examinations have been made tabulations from these sheets will I believe, prove quite helpful in determining the amount of bacterial and chemical contamination of the air of railway coaches as well as form a basis of suggestions which we feel will enable our railways to adopt better sanitary methods of cleansing as well as constructing their cars. Unfortunately we have been so busy with our routine work during the past few months that an insufficient number of examinations have been

made to serve as the basis for reliable data at the present time. We are so arranging our work at the present time so as to enable us to do considerable of this work during the summer, and the entire remainder of the year.

STATISTICS

The clerk of the laboratory has recently as time afforded gone over a part of the laboratory cards, and tabulated the conditions and findings in such a way as to give us data which are not only exceedingly interesting, but I am sure will in time be of much value not only to our laboratory, but to other laboratories of the country and to the advancement of science of infectious diseases in general. Thus far it has been possible to tabulate the data from diphtheria cards only. To indicate what is being done and to suggest its value permit me to briefly present the results of the tabulation made up to date. The following statistics are based upon 3289 examinations, of which 1555 were made for diagnosis and 1734 for release of quarantine:

NUMBER OF SPECIMENS SENT FROM EACH PATIENT FOR DIAGNOSIS

a—first for diagnosis	1515
b—second for diagnosis	40

SEX.

a—Male	647
b—Female	829

DIAGNOSIS BY PHYSICIAN AND LABORATORY

A—Diphtheria.	
a—Laboratory found diphtheria bacilli	393
b—Laboratory did not find diphtheria bacilli	247
B—No diphtheria.	
a—Laboratory did not find diphtheria bacilli	390
b—Laboratory found diphtheria bacilli	79
C—Possibly diphtheria.	
Laboratory finding { Positive	92
{ Negative	173
D—Don't know.	
Laboratory finding { Positive	41
{ Negative	131

Out of 196 examinations, in 98 the diphtheria bacilli were found in pure culture.

AGE OF PATIENT

a—1-5 years	216
b—7-15 years	663
c—16-60 years	425
d—over 60 years	5

OCCUPATION

Agents	4
Bankers	2
Barbers	4
Business (indoors)	65
Clergymen	2

OCCUPATION—Continued

Dentist	2
Druggist	1
Housekeeper	198
Laborer (outdoors)	90
Lawyer	2
Nurse	8
Mail carriers	3
Physician	5
Railway Employees	8
Student	674
Teacher	18

SOCIAL STATE

Married	213
Single	938
Widow and widowers	4

LENGTH OF TIME AFTER BEGINNING OF DISEASE THAT CULTURE WAS SENT

1 day	328
2 day	293
3 day	218
4 day	115
5 day	79
6 day	31
7 day	69
8 day	13
9 day	6
10 and over	69

SOURCE OF INFECTION

Not known	855
School	221
Family	103
Physician or nurse	4

NUMBER OF OTHER CASES OF DIFTHERIA IN THE HOUSE

None	1029
1	91
2	45
3	15
4	15

MEMBRANE (FIBRINOUS EXUDATE) PRESENT

Nares	68
Pharynx	349
Tonsils	758
Larynx	81

EXUDATE (SEROUS) PRESENT

Nares	68
Pharynx	290
Tonsils	616
Larynx	65
No membrane, no serous exudate, but redness	100
No inflammation of any kind	31

TEMPERATURE

98	148
99	218
100	247
101	300
102	223
103	142
104	26
105	9

CONSTITUTIONAL SYMPTOMS

Poor appetite	74
Sleepless	47
Cough	45
Headache	278
Weakness	166
Pain in neck	177

ANTITOXIN USED AT TIME SPECIMEN WAS SENT

Yes	440
No	901

RELEASE FROM QUARANTINE

A—Number of specimens sent to obtain release from quarantine:

1	489
2	352
3	76
4	36
5	11
6	12
7	6

B—Release from quarantine in number of days after beginning of disease:

1—14th day	334
15—21st day	385
22—28th day	201
29—35th day	23
36th etc.	4

FINANCIAL REPORT

Since the funds of the laboratory have been estimated by the biennium, I have chosen to present at this time, the financial report of the past two years which represents the report of the expenditures from the time when the laboratory was started until the present time.

The bill which created the laboratory went into effect as soon as the bill was printed in the Register and Leader, and the Iowa State Capitol, two Des Moines Papers. Its going into effect at that time made \$5,541.67 available for support fund, and \$1,000 available for equipment. You will remember also that the Board of Regents of the University gave an additional \$5,000 for equipment. The following represents a statement of warrants drawn from the Board of Health fund not including those taken from the University fund; first, a statement of warrants drawn on account of Bacteriological Laboratory fund; second,

a statement of warrants drawn on account of Apparatus fund of the State Board of Health. The copies of the various items in detail have been filed with the Secretary of the State Board of Health and the State auditor.

STATEMENT OF
WARRANTS DRAWN ON ACCOUNT OF BACTERIOLOGICAL LABORATORY FUND

FROM THE LABORATORY SUPPORT FUND

1904.			
July 26, No. 16655	—To Henry Albert, traveling expenses....	\$	91.05
July 28, No. 16682	—To Henry Albert, *.....		18.83
Aug. 11, No. 17175	—To A. M. Linn, Traveling expenses.....		82.58
Sept. 30, No. 18062	—To Henry Albert, Salary Aug.....		41.66
Sept. 30, No. 18063	—To Henry Albert, Salary Sept.....		41.66
Sept. 30, No. 18064	—To Gertrude Story, Salary Aug.....		15.00
Sept. 30, No. 18065	—To Gertrude Story, Salary Sept.....		15.00
Oct. 3, No. 18342	—To Paul Shekwana, Salary Sept.....		83.33
Nov. 3, No. 19182	—To Gertrude Story, Salary Oct.....		15.00
Nov. 5, No. 19236	—To Henry Albert, Salary Oct.....		41.66
Nov. 5, No. 19237	—To Paul Shekwana, Salary Oct.....		83.33
Nov. 3, No. 19180	—To Henry Albert, *.....		39.24
Nov. 17, No. 19501	—To Henry Albert, *.....		14.43
Nov. 18, No. 19537	—To U. S. Express Co.....		50.70
Dec. 10, No. 182	—To Paul Shekwana, Salary Nov.....		83.33
Dec. 10, No. 183	—To Henry Albert, Salary Nov.....		41.66
Dec. 10, No. 184	—To Gertrude Story, Salary Nov.....		15.00
1905.			
Jan. 7, No. 871	—To Gertrude Story, Salary Dec.....		15.00
Jan. 7, No. 872	—To Henry Albert, Salary Dec.....		41.66
Jan. 7, No. 873	—To Paul Shekwana, Salary Dec.....		83.33
Jan. 16, No. 1098	—To Henry Albert, *.....		52.15
Feb. 1, No. 1636	—To Henry Albert, *.....		11.03
Feb. 1, No. 1637	—To Henry Albert, *.....		11.63
Feb. 1, No. 1638	—To Gertrude Story, Salary Jan. '05.....		20.00
Feb. 1, No. 1639	—To Paul Shekwana, Salary Jan. '05.....		83.33
Feb. 1, No. 1640	—To Henry Albert, * Salary Jan.....		65.64
Feb. 1, No. 2080	—To Henry Albert, *.....		48.00
Mar. 6, No. 2472	—To Paul Shekwana, Salary Feb.....		83.33
Mar. 6, No. 2473	—To Henry Albert, Salary Feb.....		41.66
Mar. 6, No. 2474	—To Gertrude Story, Salary Feb.....		15.00
Mar. 6, No. 2505	—To Henry Albert, *.....		63.15
Apr. 11, No. 3358	—To Henry Albert, Salary Mar.....		41.66
Apr. 11, No. 3359	—To Paul Shekwana, Salary Mar.....		83.33
Apr. 11, No. 3360	—To Gertrude Story, Salary Mar.....		15.00
Apr. 14, No. 3439	—To Henry Albert, *.....		18.58
May 22, No. 4439	—To Henry Albert, Salary April.....		41.66
May 22, No. 4440	—To Paul Shekwana, Salary April.....		83.33

May 22, No. 4441	—To Anna Stach, Salary April.....	\$	15.00
June 6, No. 4962	—To Anna Stach, Salary May.....		15.00
June 6, No. 4963	—To Paul Shekwana, Salary May.....		83.33
June 6, No. 4964	—To Henry Albert, Salary May.....		41.66
June 6, No. 4965	—To Henry Albert, *.....		48.50
Aug. 17, No. 7068	—To Anna Stach, Salary July.....		15.00
Aug. 17, No. 7069	—To Fred Albert, Salary July.....		41.66
Aug. 17, No. 7070	—To Paul Shekwana, Salary July.....		83.33
July 5, No. 5798	—To Fred Albert, Salary June.....		41.66
July 5, No. 5799	—To Paul Shekwana, Salary June.....		83.33
July 5, No. 5800	—To Anna Stach, Salary June.....		15.00
Sept.	To Henry Albert, Salary Aug.....		41.66
Sept.	To Paul Shekwana, Salary Aug.....		83.33
Sept.	To Anna Stach, Salary Aug.....		15.00
Oct.	To Henry Albert, Salary Sept.....		41.66
Oct.	To Paul Shekwana, Salary Sept.....		83.33
Oct.	To Anna Stach, Salary Sept.....		15.00
Oct. 3,	To Henry Albert.....		4675
Oct. 10,	To Henry Albert.....		10.23
Oct. 31,	To Henry Albert, Salary Oct.....		83.33
Oct. 31,	To Paul Shekwana, Salary Oct.....		83.33
Oct. 31,	To Anna Stach, Salary Oct.....		15.00
Oct. 31,	To Henry Albert.....		19.99
Nov. 8,	To L. A. Qualife.....		40.00
Nov. 8,	To H. M. Decker.....		15.00
Nov. 11,	To Iowa Telephone Co.....		12.00
Nov. 1,	To Henry Albert.....		12.03
Nov. 18,	To Henry Albert.....		24.65
Dec. 1,	To Paul Shekwana, Salary Nov.....		83.33
Dec. 1,	To Henry Albert, Salary Nov.....		83.33
Dec. 1,	To Anna Stach, Salary Nov.....		15.00
Dec. 1,	To Henry Albert.....		25.59
Nov. 1,	To H. M. Decker.....		7.50
Dec. 1,	To L. A. Qualife.....		20.00
Dec. 1,	To E. Osnes.....		7.28
1906.			
Jan. 3,	To Henry Albert, Salary Dec.....		83.33
Jan. 3,	To Paul Shekwana.....		83.33
Jan. 3,	To H. M. Decker.....		7.50
Jan. 3,	To L. A. Qualife.....		20.00
Jan. 3,	To Anna Stach.....		75.00
Jan. 3,	To Henry Albert.....		34.05
Jan. 3,	To Henry Albert.....		27.63
Feb. 1,	To Henry Albert, Salary Jan.....		83.33
Feb. 1,	To Paul Shekwana, Salary Jan.....		83.33
Feb. 1,	To L. A. Qualife, Salary Jan.....		20.00
Feb. 1,	To H. M. Decker, Salary Jan.....		7.50
Feb. 1,	To Anna Stach, Salary Jan.....		15.00
Mar. 5,	To Henry Albert, Salary Feb.....		83.33

Mar. 5.	To Paul Shekwana, Salary Feb.	\$ 83.33
Mar. 5.	To L. A. Quaife, Salary Feb.	20.00
Mar. 5.	To H. M. Decker, Salary Feb.	7.50
Mar. 5.	To Anna Stach, Salary Feb.	15.00
Mar. 5.	To Henry Albert,	20.55
Mar. 5.	To Iowa Citizen Publishing Co.	3.00
Mar. 5.	To George Hummer Mercantile Co.	2.40
Apr. 2.	To Henry Albert, Salary Mar.	83.33
Apr. 2.	To Paul Shekwana, Salary Mar.	83.33
Apr. 2.	To L. A. Quaife, Salary Mar.	20.00
Apr. 2.	To H. M. Decker, Salary Mar.	7.50
Apr. 2.	To Anna Stach, Salary Mar.	15.00
Apr. 2.	To University Press Co.	25.56
Apr. 2.	To Henry Albert,	16.50
Apr. 2.	To Henry Albert,	9.65
May 5.	To Henry Albert, Salary April.	83.33
May 5.	To Paul Shekwana, Salary April.	83.33
May 5.	To L. A. Quaife, Salary April.	20.00
May 5.	To H. M. Decker, Salary April.	7.50
May 5.	To Anna Stach, Salary April.	15.00
May 5.	To Bell Telephone Co.	12.00
May 5.	To Henry Albert	23.45
May 5.	To Mahoney Dray Co.	2.80
June 5.	To Henry Albert, Salary May.	83.33
June 5.	To Paul Shekwana, Salary May.	83.33
June 5.	To L. A. Quaife, Salary May.	20.00
June 5.	To H. M. Decker, Salary May.	7.50
June 5.	To Anna Stach, Salary May.	15.00
June 5.	To L. M. Dutcher,	4.75
June 5.	To Park Davis & Co.	7.00
June 5.	To Henry Albert, Salary June.	83.33
June 20.	To Paul Shekwana, Salary June.	83.33
June 20.	To L. A. Quaife, Salary June.	20.00
June 20.	To H. M. Decker, Salary June.	7.50
June 20.	To Anna Stach, Salary June.	15.00
June 20.	To Henry Albert,	31.05
June 20.	To Iowa Citizen Pub. Co.,—Labels—	6.00
June 20.	To S. M. Gunn, Microscopic & Lantern slides	75.00
June 20.	To Paul Shekwana, expenses car inspection	2.50
June 20.	To Spedel Bros, laboratory gowns.	7.00
June 20.	To Mrs. H. D. Connell, laboratory work.	25.50
June 20.	To L. C. Larson, animals.	90.90
June 20.	To George Hummer Mer. Co.,—paper—	2.32
June 20.	To Bausch & Lomb Optical Co., supplies.	458.08
		\$ 5,609.50

STATEMENT OF WARRANTS DRAWN ON ACCOUNT OF APPARATUS FUND

1904.		
Oct. 12, No. 18572—To Illinois Glass Co.	\$ 223.63	
Nov. 3, No. 19181—To Henry Albert.	6.32	
Nov. 3, No. 19234—To Mahoney & Sons.	21.50	
Nov. 3, No. 19235—To Mahoney & Sons.	2.50	
1905.		
Feb. 28, No. 2091—To Henry Albert.	4.15	
Mar. 2, No. 2395—To U. S. Express Co.	143.95	
Mar. 6, No. 2471—To U. S. Express Co.	36.95	
June 1, No. 4824—To U. S. Express Co.	59.88	
Sept. 30, No. 18066—To Osgood & Blodgett Mfr Co.	37.50	
Oct. 12, No. 18573—To University Press Co.	100.00	
Oct. 12, No. 18574—To Park, Davis & Co.	1.20	
1906.		
June 20.	To W. S. Thomas.	7.85
Mar. 12.	To U. S. Express Co.	22.65
Apr. 9.	To U. S. Express Co.	13.30
June 1.	To Bramhall Deane & Co.	52.08
June 1.	To John Wiley & Sons.	3.83
1905.		
Oct. 23.	To University Press Co.	19.50
Nov. 18.	To U. S. Express Co.	60.10
Nov. 21.	To J. T. Ries.	7.38
Dec. 2.	To U. S. Express Co.	28.95
1906.		
Jan. 4.	To U. S. Express Co.	30.60
Jan. 4.	To University Press Co.	3.00
Jan. 4.	To E. Osnes.	9.45
Feb. 2.	To U. S. Express Co.	20.50
Feb. 2.	To C. Hurley, repair incubator.	26.40
Mar. 5.	To M. Gerber.	4.85
Mar. 5.	To Bausch & Lomb.	1.50
Apr. 2.	To Elmer & Amend.	11.31
Apr. 2.	To MacMillan Co.	2.52
Apr. 2.	To Elmer & Amend.	11.60
Apr. 2.	To W. P. Hohenschuh.	3.00
Apr. 2.	To Maresh Bros.	54.53
May 5.	To Bausch & Lomb.	83.70
May 9.	To U. S. Express Co.	17.10
June 1.	To U. S. Express Co.	23.86
June 1.	To W. S. Thomas.	7.85
June 1.	To U. S. Express Co.	17.35
June 1.	To Maresh Bros, for apparatus and kettles	32.01

\$ 1,199.37

The following table represents the number of examinations made in the laboratory every month during the year:

Date.	Diphtheria.		Typhoid Fever			Tuberculosis		Miscellaneous.		
	Pos.	Neg.	Pos.	Neg.	Q.	Pos.	Neg.	Pos.	Neg.	Q.
Oct. 1904.	23	23	14	4	1	17	19	6	3	
Nov. 1904.	53	85	7	24	1	16	23	2	2	
Dec. 1904.	77	125	3	20		36	65	1	6	
Jan. 1905.	91	155	12	20		45	100	4	4	
Feb. 1905.	27	119	9	18	1	43	100	4	4	
Mar. 1905.	38	85	6	22	6	66	128			10
Apr. 1905.	28	81	5	16	5	55	116			28
May 1905.	28	81	7	18	4	62	101	5	14	
June 1905.	59	69	7	15	6	59	86	4	5	
July 1905.	41	44	20	23	3	55	89	5	9	
Aug. 1905.	80	41	20	20	7	61	105	4	5	
Sept. 1905.	40	43	17	28	2	28	96	2	4	
Total.....	496	919	127	228	40	524	1007	46	81	10

CULTURE STATIONS

There are 677 Culture Stations in the State. Culture Stations are being established from time to time as conditions demand. The following is a list of the Culture Stations of the Laboratory, of the Special Agent and the Local Health Officer upon whose recommendation the Culture Station was established at that place:—

CITY	SPECIAL AGENT	HEALTH OFFICER
Abingdon	S. W. Head	David O. King
Ackley	J. M. Mix	C. W. Vroom
Adair	W. A. Sireann	A. J. Zook
Adel	H. B. Heston	W. E. Scott
Afton	L. M. Walker	E. M. Johnson
Agency	S. V. Sampson	J. F. Newell
Alasworth	Sands Bros.	H. B. Hamilton
Alton	S. R. Cobb	H. H. Cliley
Albert City	W. B. Gillman	B. B. Bridge
Albia	G. D. Miller	H. C. Eschbach
Albia	J. J. Whitacre	W. B. Mantle
Alburnett	C. E. Hense	P. G. Eilers
Alden	W. H. Lewis	W. H. Lewis
Algona	C. R. Sheets	F. T. Seeley
Alorton	J. B. Rankin	D. E. Williams
Allison	W. J. Vaupel	W. J. Vaupel
Alta	D. E. Hadden	G. Hadden
Alton	A. J. Shaul	T. V. Gleystein
Altona	L. O. Shaffer	C. C. Lang
Alvord	W. P. Page	S. E. Blair
Amama	C. F. Noe	C. F. Noe
Ames	G. Judisch	H. M. Templeton
Anamosa	P. Sigworth	F. B. Sigworth
Anita	W. P. Major	F. K. King
Anthon	B. Hart	W. L. Strlman
Applington	S. E. Austin	E. L. Blackmore
Arcadia	J. B. Feenstra	H. Lando
Aredale	G. A. Slaughter	C. F. Osborne
Arlington	W. Shingway	O. O. Ayer
Armstrong	J. C. Hassel	H. W. Canfield
Arthur	I. N. Beyer	W. Rendtorff
Ashton	J. H. Carmichael	A. E. Nelson
Atalissa	S. Chesbrough	S. Chesbrough
Atlantic	J. S. Goss	W. S. Mullins
Auburn	J. Kessler	H. L. Tobus
Audubon	J. E. Griffith	F. Rosenblatt

CITY	SPECIAL AGENT	HEALTH OFFICER
Aurelia	H. Strouse	S. W. Hobbs
Avoca	Priest & Lanostad	O. Salomon
Ayrshire	E. Maize	E. E. Morton
Bagley	J. W. Thompson	J. A. Pringle
Bancroft	Walters & Nemmers	C. McWalters
Barnum	W. Conley	J. C. Riordan
Bassett	Dr. Blowers	Dr. Blowers
Beavalia	W. R. Marsh	H. E. Woods
Battle Creek	V. W. Sylvester	C. E. Conn
Baxter	C. Torney	C. C. Graham
Bayard	J. Corbett	W. L. Thompson
Bedford	H. Rhodes	S. Clabaugh
Belle Plaine	Nichols & Herlyk	J. W. Williams
Belleveue	E. A. Hunsley	C. Davidson
Belmond	Kendrick & Schultz	F. A. Stevens
Bennett	T. B. Nyquist	H. R. Chapman
Benton	F. H. Landis	F. H. Landis
Berea	E. T. DeWitt	F. DeWitt
Birmingham	W. Beardsley	J. M. Randall
Blairtown	B. F. Paul	S. H. Watson
Blanchard	H. Elbert	E. Prall
Blockton	F. Wright	A. E. King
Bloomfield	Gibbons & McEachran	H. C. Young
Bloungs	H. P. Vander	W. I. Vandervier
Bondurant	H. Calkins	L. V. Porter
Bode	E. L. Watson	E. E. Walker
Boone	P. Elliott	J. C. Walker
Boyden	M. Brink	S. E. Gannon
Bradgate	W. G. Butler	D. E. Graben
Brayton	L. E. Reynolds	L. E. Reynolds
Brighton	W. G. Israel	W. S. Parks
Bristow	W. A. Richards	G. A. Anloby
Britt	R. V. Wood	A. J. Cole
Brooklyn	C. T. Hainsburg	A. H. Barker
Buckeye	E. S. Kahrs	C. S. Trimble
Buffalo	C. Zogg	L. J. Porttmann
Buffalo Center	H. F. Thompson	H. E. Eiel
Burlington	E. L. Naumga Drug Co.	Dr. Stutzman
"	Henry Dene Co.	"
"	Wm. O. Kaiser	"
Burt	Robinson Drug Co.	"
"	W. T. Peters	W. T. Peters
Callamus	W. H. Eaton	W. H. Eaton
Callander	G. W. Knuston	A. Arent
Cambridge	W. W. Lexovold	H. P. Hansen
Carbon	M. E. Jackson	W. F. Frazier
Carlisle	D. E. Dowd	W. E. Sherow
Carroll	Sturges & Thudemann	L. G. Patty
Carson	C. H. Ketterwell	W. F. Pierce
Cascade	J. L. Roche & Co.	W. W. May
Cassey	Jacobs Drug Co.	W. T. Duncan
Cedar Falls	C. H. Wise	H. C. Hiebert
Cedar Rapids	Emerson Drug Co.	"
"	J. F. Whillbarn	E. T. Lawler
Center Junction	J. M. Young	J. M. Young
Centerpoint	G. R. Dunbar	D. R. Yost
Centerville	A. Waller	C. P. Tiltman
Central City	Stoehr & Hadsel	Charles Fisher
Charlton	C. R. Kirk	T. Barnes
Charles City	R. Dodd	S. R. Hewett
Charlotte	P. H. Manion	P. H. Manion
Charter Oak	H. McWilliams	J. J. McWilliams
Chelsea	H. C. Condon	C. P. Condon
Cherokee	N. Mikloske	P. B. Roberts
Chester	J. D. Lyon	J. D. Lyon
Churdan	M. H. Beery & Co.	O. C. Lehr
Cincinnati	H. Powers	J. W. Sturdivant
Clarence	C. Parks	Dr. Smith
Clarinda	J. Anderson	J. W. Sellers
Clarion	Harisock-Barr & Co.	E. D. Tomkins
Clarksville	J. Ford	H. C. Smith
Clearfield	W. I. Frito	J. P. Maxwell
Clear Lake	Mr. White	A. B. Phillips
Cleghorn	T. T. Macomb	W. P. Roberts

CITY	SPECIAL AGENT	HEALTH OFFICER
Clermont	P. B. Berry & Co.	P. B. Berry
Clinton	M. B. John & Co.	C. F. Kellogg
"	Harry B. Campbell	"
"	D. B. Snyder	"
Clio	W. A. Brommer	D. B. Kelly
Coggon	L. G. Hall	A. J. Ryer
Coln	M. Gauss	A. H. King
Coltsburg	J. A. Bush	C. A. Tobie
Colfax	J. B. Sherbon	J. B. Sherbon
Collins	J. H. Meeker	H. W. Sanders
Colo	E. J. Carver	J. I. Hostetter
Columbus	J. F. Cochran	E. Whitlatch
Commerce	T. D. Hume	T. D. Hume
Conesville	J. F. Collin	H. H. English
Conrad	C. G. Fritzel	W. A. Kaufman
Conway	E. Ryerson	A. T. West
Coon Rapids	G. S. Childs	E. W. Downs
Correctionsville	W. M. Wright	W. P. McQuinty
Corydon	W. S. Sprout	G. Sollenbarger
Council Bluffs	Camp Bros	M. A. Thiley
"	Morgan & Dickey	"
"	J. W. Schott	"
Crawfordsville	G. F. Niblock	G. F. Niblock
Crescent	A. A. Robertson	A. A. Robertson
Cresco	Lomas & Mills	W. T. Daly
Creston	E. A. Aldrich	J. W. Reynolds
Cumberland	I. Gardiner	A. Weaver
Cushing	C. W. Noble	C. W. Noble
Dallas	N. Pettit	E. J. Butterfield
Dallas Center	R. H. Loucks	G. W. Marney
Danbury	H. C. Sanford	J. S. Gaumer
Danville	A. Elper	H. L. Hawden
Davenport	G. G. Lauffer	"
"	J. S. Weber	"
"	Ballard Drug & Dental Co.	"
"	E. A. Moetzel	"
"	West Day Drug Co.	"
Davis City	J. H. Robinson	J. W. Wallis
Dayton	Colo Drug Co.	H. E. Nelson
Decorah	Burnt & Pannan	A. J. Sweeney
Deep River	C. K. Cain	Drs. Crain & Crain
Defiance	W. W. Konkle	T. H. Baer
Delhi	L. Barnes	W. Cummings
Delmar	J. T. Scott	L. J. Scott
Delta	Burt & Mahannah	F. J. Javira
Dendron	C. C. Voelker	G. J. Bennett
Denver	Ph. A. Slumberger	Dr. Plumptre
Denmark	Geo. E. H. Howard	A. M. Linn
Des Moines	Same as Fort Madison.	"
"	McArthur Drug Co.	"
"	Owl Drug Co.	"
"	E. G. Barrett	"
"	E. E. Twining	"
"	W. A. Graham	"
"	A. Hammer	"
Desoto	W. L. Sackett	M. T. Brewer
Dewitt	J. B. Webb	M. Lyon
Dexter	J. G. Stanley & Son	M. G. Sloan
Diagonal	H. C. McCall	H. C. McCall
Dickens	D. L. Smith	R. P. Backstone
Donnellson	J. A. Larson	T. R. Washburn
Doon	J. A. Hoff	F. J. Breck
Dougherty	T. C. Ryan	H. H. Abegg
Dow City	J. E. Doser	W. C. Norman
Dows	F. L. Goodlander	A. L. Hoyt
Drakesville	A. L. Hoyt	T. B. Jennings
Dubuque	E. C. Arno	D. B. Michel
"	G. F. Thormann	"
"	F. W. Ruete	"
"	W. Ulmer	"
Dunkerton	E. W. Magee	F. M. Isom
Dunlap	T. Lohan	J. W. Lohan
Durant	V. W. Hynes	V. W. Hynes

CITY	SPECIAL AGENT	HEALTH OFFICER
Dyersville	E. Bruckner	R. H. Lubrman
Lyons	C. F. Douglass	E. A. Schenbrenner
Eagle Grove	H. Sorenson	C. H. Morse
Enterprise	Enterprise Drug Co.	L. V. Porter
Earlville	C. A. Kendall	C. B. Rogers
Eddyville	E. Stephenson	F. M. McCrea
Edgewood	F. D. Kriebs	E. S. Donaldson
Eldon	E. J. Moore	Dr. Sawyer
Eldora	Smith & Reed	E. O. Kooneman
Eldridge	C. T. Kemmerer	C. T. Kemmerer
Elgin	G. Stoehr	C. O. Fothergill
Elkader	W. Berker	W. A. White
Elkport	G. Kriebs	F. J. Kriebs
Elliot	C. B. Hathert	C. U. Baldwin
Elliston	D. D. Armitage	A. C. Armitage
Ellsworth	E. E. Peterson	D. G. Backlund
Elma	E. E. Oorfield	E. E. Oorfield
Emerson	E. G. Collins	E. A. Merritt
Emmetsburg	Harwood	F. Hunter
Elworth	E. J. Higgins	S. Frank
Essex	Wm. Quist	W. H. Moore
Etherville	S. H. Williams	W. E. Bradley
Exira	N. Dodging	J. Riley
Fairbank	W. M. Higbee	E. Molloy
Fairfax	E. Pickins	J. F. Divorak
Fairfield	S. Thoma	A. S. Hague
Fairley	A. Barclay	C. A. Kearney
Farmington	F. Kiek	W. J. Kirkpatrick
Farmhamville	J. C. Orsinger	S. J. Farlow
Farragut	A. F. Coleman	H. Coleman
Fayette	W. B. Richert	J. D. Parker
Fenton	F. J. Elger	F. W. Logan
Fertile	A. J. Peterson	J. R. Jones
Florida	W. W. Parker	W. W. Parker
Fonda	Domer & Moorl	T. G. Dower
Fontanelle	W. W. Stoll	P. McDermid
Forest City	P. O. Koto	P. H. Yeaterberg
Ft. Atkinson	Horton-Burns Drug Co.	C. E. Horton
Ft. Dodge	J. P. Hine	Dr. Bowen
Ft. Madison	J. H. Axt	G. P. Seal
Postor	J. R. Cross	J. R. Cross
Postoria	R. W. Minard	R. W. Minard
Franklin	J. P. Dixon	J. P. Dixon
Fredericksburg	P. E. Farrand	E. N. Johnston
Galesburg	E. T. Carmenter	P. Carmenter
Galva	C. H. Whitten	A. M. Bilby
Garden City	Schulz Drug Co.	"
Garden Grove	H. M. Postis	E. W. Doolittle
Gerner	Ziegl Bros	H. M. Hong
Garrison	I. F. Holden	H. A. Angus
Garwin	Harve Hill	M. M. Whitfill
Geneva	W. T. Overton	R. L. Sliedright
Germania	T. J. Ward	T. J. Ward
Gilbert Station	R. M. A. Collins	R. M. A. Collins
Gilmann	T. L. Gould	W. F. Stitt
Gilmore City	A. L. Belt	A. L. Belt
Gladbrook	E. Rheder	G. Meyer
Glenwood	Dr. P. Donelan	C. H. Witt
Gidden	R. Exbury	J. Doshier
Goldfield	A. McAcchorn	H. H. Hanna
Goodell	G. W. Butts	W. L. Gilbert
Gowrie	Dr. J. E. Vance	W. W. Lundrick
Graettinger	T. D. Collins	E. A. Burdick
Grand Junction	D. W. Lowery	O. W. Lowery
Grand Mount	D. D. Hweelington	M. S. Jordan
Grand View	D. J. Higley	D. J. Higley
Granger	R. Kilpatrick	C. G. Smith
Grant	G. T. Carr	Dr. Montgomery
Grassville	E. N. Thomas	E. R. Thom
Gravity	Hawley Drug Co.	L. F. Rold
Gray	C. E. Mertz	L. A. Beers
Greene	Coles Drug Co.	W. E. Patterson
Green Mountain	I. A. Levy	J. P. Strahl
Grimes	W. J. Stewart	A. L. Peacock

CITY	SPECIAL AGENT	HEALTH OFFICER
Grinnell	R. R. Rust & Co.	S. C. Buck
Grinsoid	P. L. Arrasmith	H. Brown
Grundy Center	Herberger & Ladage	M. H. Thelen
Guerney	G. Beveridge	G. Beveridge
Guss	C. B. Kimpson	E. E. McDonough
Guthrie Center	A. D. Lemon	E. L. Bower
Guttenberg	W. H. Hite	A. E. Ryer
Hamberg	D. W. Swigart	Wade Sperry
Hampton	C. Marshall	A. J. Hobson
Hancock	F. G. Smart	A. S. Stephens
Hardy	T. Townalick	J. J. Bowse
Harlan	G. M. Pedersen	J. Bisgard
Harpers Ferry	B. G. Bessler	R. G. Bessler
Harris	O. F. Lins	C. C. Cady
Hartley	A. B. McCready	C. Eger
Hartwick	B. H. Reed	J. S. Ormiston
Harvey	M. Elerick	A. Sandy
Hastings	T. H. Priest	W. R. Whitwall
Havelsack	J. B. Shelton	F. E. Hesthman
Hawarden	L. L. Harlan	F. J. McAllister
Hawkeye	C. J. McLaughlin	G. C. Fretschel
Henderson	C. E. Irwin	W. D. Craig
Hilton	Hilton Drug Co.	J. F. Gray
Hiram	H. A. Dinsmore	W. I. Robb
Holland	C. L. Connel	A. W. Harold
Holstein	J. F. Walker	G. H. Crane
Homeshead	F. W. Mills	F. E. Mills
Hopeville	G. I. Arncliffe	G. I. Arncliffe
Hopkinton	A. A. Gerhart	L. T. Cummings
Hudson	N. T. Joder	E. E. McMillar
Humboldt	C. H. Hubbard	W. H. Stokes
Hunston	Foltz Bros.	R. R. Arnold
Huxley	O. J. Severoid	J. C. Swatslander
Ida Grove	J. C. Loucks	J. E. Conn
Imogen	M. M. Harbort	L. L. Baker
Independence	D. W. Taber	J. H. McGrady
Indiana	D. W. Husted	G. H. Alden
Inwood	C. Aberton	A. Struble
Ionia	C. B. Moody	H. Hulbur
Ira	E. Carpenter	E. Carpenter
Irelin	S. H. Waters	W. E. Waters
Iowa Falls	Chas. Hibner	W. I. Morton
Janesville	W. P. Stauffer	C. S. Bradford
Jefferson	E. W. Foy	C. Enfield
Jesup	T. Freed	E. W. Haradon
Jewell	Cole Co.	P. R. Lewis
Jolley	J. R. Thompson	J. R. Thompson
Kalona	A. M. Wray	W. J. Jones
Kanawha	J. D. Torrence	W. W. Wyatt
Kellerton	G. W. Carman & Co.	A. L. Judd
Kellogg	D. B. Liesman	J. M. Havelly
Kennett	H. B. Graesser	H. B. Graesser
Keokuk	L. K. PeFever	A. B. Hughes
Keosauqua	F. H. Roberts	J. A. Craig
Kedra	R. C. Hamilton	J. P. Richardson
Kewick	V. L. Ferguson	H. H. Conroy
Keystone	J. R. Rielenburg	J. R. Rielenburg
Kingsley	Dr. Wilder	H. J. Wright
Kinross	F. E. Kerr	C. M. Boone
Kirkman	J. Gregerson	A. E. Sablin
Kiron	C. G. Walters	E. A. Burrows
Klemm	J. F. Harr & Co.	G. M. Harrison
Knoxville	M. W. Roden	O. M. Harrington
Lacona	S. A. Halston	G. E. Hatfield
Ladora	J. E. Bosley	G. L. Pray
Lake City	V. M. Cook	G. L. Pray
Lake Mills	P. H. Parker	E. C. Keeler
Lake Park	W. H. Henebeck	S. C. Scholz
Lake View	W. E. Jour	M. F. Keon
Lansboro	J. W. Gely	W. E. Hart
Lamont	J. Walker	C. E. Wright
Lamont	The Lamont Drug Store	G. W. Hoffman
Lansing	J. Ackerman	J. W. Davis

CITY	SPECIAL AGENT	HEALTH OFFICER
Laporte City	Blanchette & McElharn	J. C. Graham
Larabee	Adams & Co.	H. Adams
Latimer	J. P. Rallahan	J. H. VanVahis
Laurel	A. E. Moe	M. R. Smith
Laurens	C. G. Reed	J. H. Hovenden
Lawler	J. E. Landon	J. W. Lynch
Leclaire	H. T. Latrens	F. C. Skinner
Ledyard	O. L. Graves	W. H. Barr
Ledyard	E. M. Mills	E. M. Mills
Leighton	L. S. Walker	L. C. Howe
Lenars	Anton Sartori	G. H. Mannen
Lenox	N. D. Adams	E. W. Bennett
Leon	W. C. Stimple	F. A. Bowman
Lester	W. E. Bouslaugh	E. W. Bouslaugh
Lewis	G. Richardson	F. O. Brown
Lima Spring	Horton Barnes Drug Co.	P. O. Simons
Linsville	T. F. King	C. B. Calbreath
Little Sioux	Clark Ellis	R. A. Weston
Linn Grove	J. Roberts	C. I. Pense
Lisbon	S. Kittering	J. R. Gardner
Liscomb	W. Zimmerman	G. A. Merahon
Little Rock	W. B. Burton & Co.	E. W. Elliott
Livemore	C. H. Denaray	C. F. Mads
Logan	L. C. Wood & Co.	J. L. Witt
Lohrville	C. C. Carmichael	P. V. Hibbs
Loneock	J. E. Gaurer & Co.	H. H. Ray Jr
Loures	E. Harris & Co.	L. Day
Lorimer	A. J. Wilson	E. C. Ayers
Lost Nation	P. B. Skelly	W. F. Skelly
Lowden	L. C. Kelling	L. F. Kelling
Laverne	W. Wroto	P. V. Jame
Lynnville	Quire & Quire	A. F. Quire
McCallsburg	Frederick Heyl	D. G. Mills
McGregor	M. T. Kennedy	A. B. Clark
Macedonia	W. C. Miller	W. F. Pesore
Macksburg	C. A. Miller	C. A. Miller
Madrid	P. Cassel	C. A. Sturgeon
Magolia	J. D. Stuart	P. H. Hanson
Malcolm	J. E. Winchell	V. S. Wilcox
Maloy	M. A. Parr	R. B. Waring
Malvern	W. D. Wagon	T. P. Parsons
Manchester	Denton & Ward	H. M. Bradley
Manilla	Sutton Bros.	J. R. Graham
Manly	G. W. Dillon	C. W. Sanders
Manning	Scheldorf Bros.	A. W. Carlisle
Manson	W. Springer	H. M. Mullarky
Mapleton	Holcomb Drug Co.	H. H. Gillespie
Mapokota	C. A. McMoray	J. C. Carson
Marble Rock	W. C. Smith	C. H. O'Keefe
Marcus	A. George	C. H. Hostetter
Marengo	C. T. Lyon	Dr. Martindale
Marion	C. N. Owen	L. Saracant
Marne	C. H. McCles	C. H. McCles
Marshallow	McBride & Will Drug Co.	F. P. Lierle
Martelle	J. C. Weinland	C. E. Kainland
Martinsburg	A. A. Peters & Co.	M. F. Moore
Mason City	M. O. Waterbury	C. E. Dakin
Masena	P. B. Snelson	W. S. Snelson
Maurice	J. C. Benson	H. D. Oggel
Maxwell	French & Flinchinger	P. Joar
Maynard	Pasco E. Hanes	G. W. Hanes
Medapolis	H. L. Fish	R. S. Pennington
Menlo	Shaver & McMillan	S. Ziebler
Meersvay	J. C. Brown	P. B. Lodge
Miles	W. H. Cook	W. H. Cook
Milford	J. O. Stinson	L. C. Fuller
Milo	W. Wanch	P. F. Price
Milton	Carder Drug Co.	L. F. Summers
Mishburn	C. E. Resant	D. S. Grossman
Minden	M. F. Keon	C. Augustine
Missouri Valley	G. P. Shiley	J. L. Talmalea
Mitchell	H. B. Howers	M. Bachman
Mitchellville	W. P. Reinhard	C. E. Hibbs
Modale	E. W. Witte	E. W. Witte

CITY.	SPECIAL AGENT	HEALTH OFFICER.
Mondamin	T. Macfarlane	T. Macfarlane
Monroe	L. Lane	J. L. Taylor
Montezuma	J. H. Platt & Co.	G. W. Wilson
Montgomery	H. G. Taggart	A. L. Druet
Monticello	H. Tarks	F. Pulaston
Moorehead	N. P. Farrell & Co.	A. A. West
Moravia	J. W. Haldon & Bro.	W. R. Day
Mt. Airy	J. Horne	C. T. Loran
Mt. Hamill	L. F. Thompson	L. F. Thompson
Mt. Pleasant	J. H. Jericho & Co.	F. A. Washburn
Mt. Vernon	Bonnet & Hill	A. Crawford
Moville	C. E. Anderson	W. H. Dewey
Muscataine	Lyell Huppert	Dr. Fullam
	McLride & Cone	
Myatie	D. H. Forsyth	W. J. Fenton
Nashua	W. P. Raymond	P. E. Stuart
Neola	A. L. Purdy	F. H. Lavery
Nevada	O. V. Graves	J. W. Bailey
Newhall	A. L. Green	W. F. Clemshaw
New Hampton	J. S. Wilkins	J. F. Torney
New Liberty	W. P. Stoltenberg	W. P. Stoltenberg
New Hartford	R. E. Wick	J. G. Evans
New London	G. M. Van Ansdall	G. M. Van Ansdall
New Providence	Drs. Lowder & Lowder	W. Lowder
Newtown	A. L. Kennedy	C. Smed
New Virginia	E. L. Cowl	E. R. Lumbacker
Nichols	A. E. Duncan	J. J. Nolan
Nodaway	J. C. Muph	W. H. Wiley
Nome	Norman Taylor Drug Co.	J. J. Hefflin
Northboro	C. E. Kellogg	C. E. Kellogg
Northbranch	Luke Baker	A. P. Studly
North English	T. M. Foster	J. R. Cone
North Liberty	J. P. Vonstein	J. P. Vonstein
Northwood	Thomson & Brown	C. A. Hurd
Norway	C. W. Chubb	E. Stinson
Oakland	A. A. Lencoker	R. G. Smith
Oakherdan	C. A. Cook	W. E. Ely
Oakholt	W. E. Stanbury	A. Gromann
Oakholm	A. P. Wilson	J. T. Cole
Ogden	A. Anderson	C. A. Noland
Olds	The Palace Pharmacy	W. R. Brock
Olds	Grant Horton	L. E. McConaughy
Olvera	E. P. Schob	J. F. Batlin
Oranage City	Dawson & Lubbers	A. DeLanmasse
Orient	P. Klingery	A. S. Howers
Osage	Greenery & Weston	A. D. Penny
Oscarola	W. Vannatten	H. L. Holtenbeck
Oskaloosa	Parfach & Shurtz Drug Co.	L. Cole
Oswego	C. J. Mills	E. J. Fizes
Ottawa	Cook & Harps Drug Store	C. Cook
Ottumwa	P. Ford	W. B. LaForce
Oxford	C. Whitford	J. A. Peters
Oxford Junction	E. A. Gilmawson	J. E. Davies
Palmer	W. C. Burdell	S. J. Brown
Parkersburg	Palmer Drug Co.	B. A. Smille
Parnell	A. O. Stuart	A. O. Stuart
Paton	F. Crocker	T. J. Shnell
Paton	T. L. Palmer	R. J. Owen
Pavilina	W. J. New & Co.	E. Dudley
Pella	D. Stinson	H. H. Vinton
Perry	P. Dooley	S. W. Hinton
Pereia	W. Medall	J. W. Medall
Pierson	F. P. Nicolls	E. J. Raw
Pilot Mound	P. G. Bove	O. Gano
Plainfield	J. P. Wells	H. A. Beam
Plainfield	J. P. Wells	G. B. Cross
Pleasant Plain	N. W. Labouch	C. W. Bailey
Polkman	E. A. Chatterton	A. E. Chatterton
Potterville	H. Dana	E. R. Bell
Potterville	J. A. Warner	J. W. Starr
Port City	W. K. Pacha	H. Matier
Porter	M. P. Mullen	F. S. Taylor
Portsmouth	H. A. Sauer	V. J. Mayer
Postville	J. M. Thoma	W. H. Clasen

CITY	SPECIAL AGENT	HEALTH OFFICER
Prairie City	W. B. Chase	W. B. Chase
Prescott	A. E. Booth	H. E. Hoesenger
Preston	H. Jenkins	H. Jenkins
Pringhar	E. G. Rust	L. A. Bushby
Quasqueton	J. W. Ridinger	G. E. Salmeld
Quincy	L. S. Brewer	S. S. Brewer
Radcliffe	M. L. Halletstad	H. Peterson
Ralston	Frank Schroder	W. T. Crew
Randalls	O. S. Gray	O. S. Gray
Randolph	D. W. Thomas	W. Kerr
Redding	W. A. McClanahan	L. O. Fullerton
Redfield	C. A. Diddy	Dr. Moorman
Red Oak	G. M. Pitt	L. A. Thomas
Reinbeck	W. F. Junger	F. Conner
Rembrandt	J. C. Severon	A. P. Stewart
Rensen	G. F. Meiner	W. H. Heller
Renwick	H. Cole	H. P. Hill
Riceville	W. Roach	H. T. Walker
Richland	M. L. Thorne	Dr. Ewell
Ridgeway	A. W. Frann	J. C. Lewis
Ringsted	O. M. Bossingham	O. M. Bossingham
Riverside	S. F. Critz	G. Marsh
Rockford	W. G. Thomas & Co.	L. E. Klinefeller
Rock Rapids	W. J. Hannum	E. North
Rockwell	J. E. Pierson & Co.	H. D. Holman
Rockwell City	G. Peter	A. C. Norton
Rodney	H. M. Bard	E. Fisher
Roland	T. P. Hermanson	E. Rice
Rolle	Core Pharmacy	E. W. Nelson
Rome	L. H. Jericho	O. W. Castor
Rose Hill	J. J. Busby	H. E. Carver
Runnels	A. W. Switzer	C. W. Bufkin
Russell	A. J. Mettlin	H. H. Nelson
Ruthven	J. R. Large	G. Babin
Rutland	A. Arent	E. E. Welsh
Ryan	U. C. Klonus	W. Donnelly
Sabula	C. G. Eldredge	F. D. Ayres
Sac City	J. H. Price & Son	W. J. Findley
Sac City	L. A. Culmsee	L. A. Culmsee
St. Anthony	Drs. Allen & Allen	Drs. Allen & Allen
St. Benedict	T. Holm	Dr. Kenetic
St. Charles	J. Jennings	S. N. Sayer
Salem	R. H. Pierce	C. W. Pittman
Salix	G. H. Countermine	J. F. Taylor
Sandora	G. H. Koltzmann	E. B. Heitz
Schaller	Marten & Lewis	F. H. McCray
Schleswig	W. H. Schultz	W. H. Schultz
Scranton	F. E. Foster	J. W. Pressnell
Sergeant Bluffs	H. O. Grey	O. F. Wilson
Sharpburg	A. E. Jeap	A. E. Jeap
Shelby	F. H. Allen	F. H. Allen
Sheldon	J. R. DeJacob & Co.	W. R. Brock
Shellsburg	J. Richardson	W. H. Smith
Shenandoah	J. L. Welch	G. M. Lucky
Siam	T. C. Jackson	W. H. Dunning
Sibley	W. B. Stevens	H. Nell
Sigourney	G. M. Namor	G. E. Banford
Sidney	A. Y. Penn	S. O. Peedee
Silver City	G. E. Leith	G. G. McCue
Sioux City	Oscar Huff Co.	J. J. Ross
"	Gus Schilling	"
"	H. A. Baker	"
"	S. H. Moore	"
Sioux Rapids	W. A. Lundvall	E. E. Smith
State	A. E. Gano	E. A. Rawson
Sloan	G. D. Montross	E. D. Frear
Smithland	E. Wendel	C. Rice
Smithler	C. Dunce	E. C. Ranger
Solon	A. E. Hofer	E. W. Harding
Somers	E. F. Richey	E. H. Little
South English	F. Euler	C. L. Held
Spillville	O. A. Rorstad & Co.	E. E. Hunter
Spillville	J. H. Hang	C. D. Horton

CITY	SPECIAL AGENT	HEALTH OFFICER
Spirit Lake	Dexheimer & McGrew	C. S. Schultz
Springville	C. Douma	H. A. Lindsay
Stanley	Dr. H. A. Lindsey	W. Gearhart
Stanton	G. W. Jirass	H. Beyer
Stark Center	R. W. Place	C. W. Hine
Stanwood	Grant Hoon	C. W. Baker
State Center	W. Newman & Co.	T. Eagle
Steamboat Rock	C. Reed	J. W. Caldwell
Stockport	E. C. Hall	D. L. Morris
Storm Lake	W. C. Skiff	A. W. Stevens
Story City	H. Gaudrup	H. Horren
Stratford	P. A. Johnson	A. E. Rogers
Stuart	Lon Smith	J. A. Bail
Sully	Frank Wray	J. B. Carpenter
Summitville	J. H. Coulter	L. H. Coulter
Sumner	L. A. Farrand	R. H. Stafford
Superior	G. L. Atkins	B. S. Louthart
Swaledale	L. E. Hugues	F. A. Cogswell
Sween City	Feet & Co.	C. W. Mattison
Taber	C. T. Lawrence	S. C. McKilrick
Terrill	W. H. Gill & Co.	A. H. Schooley
Thompson	C. F. Fletcher	G. M. Lee
Thornburg	Hamilton & Son	C. W. Hamilton
Thornton	Ray Seney	R. F. Weston
Thurman	J. L. Rice	W. H. Fletcher
Timley	T. P. Asbury	L. R. Hindsdill
Tipton	J. L. Kallam	A. A. Grims
Tionka	A. Falkenhalnes	A. W. Packard
Tracy	L. E. Park	L. E. Park
Traver	A. C. Sievers	J. A. Pinkerton
Trilpott	G. A. Shores	H. C. Jungblut
Truro	Hutchinson & Maber	J. A. Hutchinson
Underwood	W. F. Cash	W. O. Wyland
Union	W. R. Halden Drug Store	E. P. Hunt
Unionville	L. R. Sidman & Co.	T. J. Case
Urbana	Mr. Diagan	
Vail	Glyn Bros	J. M. Glyn
Vancleve	E. A. Cantonwine	E. A. Cantonwine
Vanhorn	P. H. Bell	E. H. Payne
Vanwert	M. Phelps	M. Phelps
Victor	S. W. Phillips	S. W. Phillips
Villisca	J. C. Cooper	J. C. Cooper
Vincent	G. S. Talon	C. A. Wilson
Walcott	J. R. Adams	M. Mendith
Walker	E. T. Kegel	E. T. Kegel
Wallingford	Swan & Murphy	L. H. Sarchett
Wall Lake	J. M. Wolden	C. Q. Quammen
Wapello	C. D. Wordmans	L. H. Jones
Walnut	H. A. Platt	E. S. Grimes
Washington	E. C. Thompson	P. F. Hanna
Washta	E. E. Lemmon	H. C. Hull
Waterloo	U. C. Rogers	Dr. Whitehead
Waterville	D. M. Burger	G. J. Mack
Wayne	B. J. Billon	B. J. Billon
Wanermer	R. K. Thompson	C. McMahon
Wankoo	The Economy Drug Co.	J. W. Smith
Waverly	A. I. Grinn	D. Stock
Wayland	W. West	L. L. Chaffer
Webb	J. Pierce	G. M. Jones
Webster City	W. T. Nov	T. H. Johnson
Weldon	G. W. Teed	C. W. Rummel
Wellman	Mrs. J. F. Snyder	E. Mitchell
Wellshurg	W. I. Watters	W. P. Gardner
West Bend	W. S. Chinn	S. Chinn
West Branch	P. P. Cuplin	A. H. Bishop
West Burlington	R. Gill	J. L. Bailey
West Chester	H. T. June	J. J. Kelly
West Liberty	B. M. Winner	E. J. Caldwell
West Nile	F. E. Tabler	E. Ady
West Union	P. Sievers Drug Store	C. L. Patterson
What Cheer	F. W. Schneider	E. A. Ainsworth
Wheeland	Alexander & Suk	C. D. Harlan
Whiting	J. A. Famble	A. W. Cook
	J. J. Thomas	J. N. Holt

CITY	SPECIAL AGENT	HEALTH OFFICER
Whittemore	A. E. Lein	W. H. Holmen
Whitten	L. P. Butler	C. A. Willett
Williams	Schults Bros	D. A. Robertson
Williamsburg	W. G. Fletcher	A. C. Moon
Wilton Junction	R. Farmer	A. R. Leith
Winfield	J. M. Lindly	J. W. Hanna
Winterset	Smith Drug Store	R. R. Davison
Winthrop	E. E. Collins	G. R. Thompson
Wlotka	C. L. Morris	M. L. Struts
Woden	C. Cunningham	N. D. Wray
Woolstock	J. C. Sulek	J. C. Smith
Wyoming	E. M. Babcock	B. H. Chamberlain
Yale	Stotts & Son	A. M. Lakin
Yarmouth	J. P. Mathias	J. P. Mathias
Yorktown	C. C. Parrott	H. W. Scales
Zealand	G. Chitt	J. A. Brown

LEGISLATION CONCERNING THE LABORATORY

The Thirty-First General Assembly considered two bills affecting the organism and work of the laboratory, first, a bill increasing the appropriation, and second, a bill regarding a sanitary water survey of the state. The first bill was passed with no opposition in either Senate or House. According to that bill there is now an annual appropriation of \$1,000.00 for apparatus and \$3,500.00 for salary and general expenses. The other bill, sanitary water survey bill introduced in the House by Representative Leech of Cedar County. It reads as follows:

A BILL FOR AN ACT TO DETERMINE THE SANITARY AND OTHER CONDITIONS AND THE NATURE OF THE NATURAL WATER SUPPLIES OF THE STATE OF IOWA BY JOINT ACTION OF THE UNITED STATES GEOLOGICAL SURVEY AND THE STATE BOARD OF HEALTH.

Be it enacted by the General Assembly of the State of Iowa:

SECTION 1. The state board of health is hereby authorized to act with the United States Geological Survey in determining the sanitary and other conditions and nature of the natural water supplies of the State of Iowa,—such water survey to have for its objects:

1st. To determine the nature and condition of the unpolluted natural water supplies of the State.

2d. To determine to what extent the natural waters are being contaminated by sewerage from cities.

3d. To determine to what extent the natural waters are being polluted by industrial wastes, such as come from glucose factories, creameries and such other sources which produce pollution and in what way these wastes might be utilized for beneficial purposes.

4th. To investigate water-borne diseases and assist in determining the best source of water supplies.

SECTION 2. There is hereby appropriated for the purpose of carrying out the provisions of the act, the sum of Three Thousand Dollars (\$3,000.00) provided that an equal sum can be obtained by and through the department of the United States Geological Survey for this work.

SECTION 3. The state board of health is hereby empowered and instructed to make such rules and regulations in conjunction with the United States Geological Department as may be necessary to carry into effect the provisions of this act.

The bill was first introduced in the House and was recommended for indefinite postponement by the public health committee. I have written to Mr. M. O. Leighton the representative of the United States Geological Survey who presented the matter to this Board at its January meeting, informing him that we regretted that this Legislature did not take any action in this matter but hoped that at some subsequent time our State Legislature would see the wisdom of the act and make adequate preparations for carrying it out. I said also that I hoped that when such a time came that we might again call upon the United States Geological Survey for cooperation.

In answer Mr. Leighton replied that he regretted that we could not undertake the survey at this time and said that whenever the State was ready to undertake such work that he would try to make the arrangements on the part of the United States Government.

PERSONNEL OR THE LABORATORY

The following represents the list of appointments and salaries of the laboratory during the year (1904-1905):

Henry Albert, Director	\$ 500.00
Paul Shekwana, 1st Asst. Bacteriologist.....	1,000.00
Anna Stach, Clerk and Stenographer.....	180.00

During the years 1905-1906 the personnel was as follows:

Henry Albert, Director.....	\$ 875.00
Paul Shekwana, 1st Asst. Bacteriologist.....	1,000.00
Anna Stach, Clerk and Stenographer.....	180.00
H. M. Decker, 2d Asst Bacteriologist.....	75.00
L. A. Qualife, Laboratory assistant.....	200.00

The laboratory is located in rooms number 305, 313-314 of the new laboratory building of the State University. The laboratory is well equipped, with the apparatus necessary for bacteriological examinations.

During the past two years the laboratory has been confined principally to routine bacteriological work. In the interest of the public health of the state its scope of activity should be broadened by such work as a water survey of the state, sanitary examinations of railway coaches and public and private buildings possibly the establishment of a serum institute for the manufacture of diphtheria antitoxin, etc., and such other work as may from time to time present itself, so that it will become a hygienic laboratory in the true sense of the term. The carrying out of such plans will necessitate larger appropriations for the maintenance of the laboratory of the Board of Health.

XV

THE POSSIBLE FUTURE OF SEWAGE DISPOSAL*

BY BURTON J. ASHLEY, C. E., Consulting Civil Engineer, Chicago.

The discovery and application of a satisfactory remedy for the ill-conditioned sanitary service for suburban districts of cities, or for the betterment of ill-advised methods of sewage disposal adopted by owners of the rapidly increasing number of country mansions and estates, has been, up to the present time largely and in some localities wholly wanting. A few eminently capable sanitary engineers have already succeeded more or less satisfactorily in disposing of sewage in localities where there were no sewers but the means employed have been, as a rule, too expensive for their adoption by persons of moderate means. These methods, largely effective though they have been, have never become generally adopted nor widely popular.

Mankind for centuries past has recognized, and still recognizes instinctively the powerful agency of the atmosphere and soil in dissolving and absorbing filth. The recognition is so universal that the act of casting the wastes of humanity to the winds and to the earth in the most heedless and haphazard way, regardless of the dire results which an over-application of filth to earth is sure to create, is a resultant act, equally as instinctive with the careless or uninformed.

It is true and therefore undeniable that these natural agents are exceedingly powerful in the purification of the organic wastes created by living, and there can be no apology for using them as such in only a rational and intelligent way, but the average citizen is not possessed of the knowledge requisite to permit him to call these elements to his aid understandingly; while on the contrary, either the scientist, the professional or the amateur, is usually well acquainted with the potent forces of Nature to purify filth and is capable of calling these forces to his aid while aiming to effect the safety and convenience of humanity.

Certain oriental nations, by force of coercive circumstances, have given the subject of sanitation much study and experiment during the century just past and the farther they progressed, the more were the elements of Nature resorted to as means to this end.

While the septic tank is not entirely out of the realm of experiment, its principles are so well understood as to make it at present a highly, if not the most potent factor in the sanitation of cities; and the cities in this and other countries using them are to be numbered by hundreds instead of by scores as counted half a decade ago.

*From Engineering World-June 20, '06, by permission.

One principle in sanitation in the past has never been lost sight of, namely: the removal of filth from the premises where it is created, as quickly after its creation as possible. In water carriage systems, this prerequisite requires the fresh sewage to be carried almost directly and immediately to the sewer. Owing to the adhesive quality of fresh sewage occasioned by the greasy matter contained therein, the possibilities of the clogging of the smaller mains is greatly enhanced. Where the sewage is plentiful, the gradients rapid and the sewers small, this danger is greatly diminished, but the average sewer extensions do not possess all these desirable requisites, and therefore follows the necessity of some means of flushing; flushing or cleaning out the stoppages by laborers and wagons, which is expensive to carry on, or flushing by means of the flush tank which is more or less expensive to install, and far less troublesome.

The practice still follows in the installment of septic tanks as a means of sewage disposal is to carry the sewage as quickly as possible to some common ground which is usually situated remotely, and there, in collected quantities to submit it to the now well understood biological processes. Carrying this sewage to such remote treated and purified requires expensive sewer systems and the question is: Can these expensive systems either be abandoned or at least be delayed in their establishment by a considerable lapse of years? In the adoption of any particular means for the sanitation of towns, cities, or even private estates and country mansions should be the ambition to secure the greatest good for the greatest number with the means provided for the purpose. Granting that this is always done, there are vast areas of suburban habitation that by reason of combined circumstances receive no benefit while sewers are being built for the benefit of other portions of the city, and at the same time city authorities provide no alternative for the relief of these deserving and expectant citizens. Not even are the methods of dry conservancy often required to be followed to the extent necessary to create greater cleanness, nor to preserve it. The citizens are permitted to attend to the sanitation of their individual premises in their own way un molested until some one guilty of sanitary carelessness causes the outbreak of enteric fevers or zymotic disease which stirs the authorities to become suddenly active only after the damage is done. Inattention by the ordinary citizen, as well as by the authorities, to the simplest of the laws of sanitation is largely due to the conscious recognition of the omnivorous quality of the soil to absorb filth, but the town official as well as the ordinary citizen more often than otherwise becomes blind to the fact that the capacity of mother earth to purify every and anything may be overdone and hence these flagrant violations of sanitary laws.

Humanity as civilization advances sees the modern residential comforts and conveniences enjoyed by others more fortunately situated, and is not slow to clamor to the authorities for such improvements as will permit introduction of modern sanitary conveniences in the homes.

It wants sewers, water service and the like, but fate, at least for the time, is usually against those so remotely situated from the centers of urban population.

Can anything be done to relieve and serve this neglected portion of humanity? Yes.

Little if anything has been done in an effective way toward experimenting with methods or of affording some economical treatment of house wastes in small units in such a way as to permit the suburban householder to obtain use of these desired residential conveniences at low cost. A few sanitary engineers have been called upon to carry on certain lines of experiments on a small scale, but always with an eye single to the possible adoption of the scheme in an enlarged way, and at no time with a view to the end of relieving the needs of the suburbanite or country householder.

Many of the new residences built in suburban districts are equipped with modern plumbing when built, in anticipation of the introduction into the neighborhood at some remote future time, of water and sewer service so much desired immediately by the owners. The prompt installation of such residential conveniences can not well be omitted when residences are being constructed, if they are to be put in at all, from the fact that to put them in afterward would entail possibly a prohibitive cost, as well as the objectionable destruction and rebuilding of parts of the interior of the house.

When built at the time the residence is constructed the cost therefor is practically a loss of just so many dollars with the interest thereon until such time as the municipality puts in the services in question, and until the house services are connected thereto and ready to use.

It is to the end of suggesting in a general way a method for the relief of these suburbanites that the writer is aiming and to give incidentally, such plan of immediate relief to the suburban householder that he may be permitted to have all the city residential conveniences, sewers or no sewers.

A residential septic tank can be made to operate with just as much effectiveness as a large one and its effluent may be given back into the soil as readily as the soil absorbs rain, and just as safely; providing always that certain requisite physical conditions exist at each individual property situation such as area, porosity of the soil and amount of gradient, etc. It has been done successfully, both in an experimental and practical way for years and there is one instance of the adoption of this plan by a new city now containing 5,000 people, and which has been in successful use for four years.

The methods of subirrigation that have in the past proved successful with unsepticed sewage, becomes doubly effective when giving treated house waste fluids back to earth. The garden, the lawn or the kitchen yard of most suburban and country premises are capable of absorbing all the liquids produced by a residential septic tank with perfect completeness and satisfaction, so long as Nature's forces are employed understandingly.

In some cases where underground drains are available instead of resorting to subirrigation, it may be convenient to turn the effluent from the residential septic tank into such drain; or it may be convenient to turn it into some nearby stream, and in either case by doing so, avoid some of the expense of constructing a suitable subirrigation scheme of disposal. Even though the effluent is not subjected to further purification than what is accomplished in the tank itself, its introduction into a stream of water is attended as a rule without odor or much, if any danger, providing the tank is made to meet the conditions perfectly under which it is to operate.

One must remember that there is nothing harmless in the presence of odor from a sewer, since its purpose seems to be only for heralding the intensity of bacterial activity from whence it emanates, and is wholly incapable of carrying disease-producing microbes. The tanks themselves emit but a very slight odor as well as the effluent since the contents in the tank are capped with a mat and the effluent has passed beyond the period of intense bacterial action.

The disposal of effluent by subirrigation is measured by the porosity of the soil. The immunity from danger by the contamination of well waters through soil absorption of the largely purified liquid lies in the absence of earth crevices, worm holes, crawfish holes, and the like, or by putting the active elements in the tank in direct communication with the veins affording the water supply or with the wells themselves; but when one stops to consider the absorbing capacity of the soil as compared with the number of gallons of water converted into sewage and cast out per diem and this method of treatment and disposal of such wastes, this objection is very largely, if not wholly and satisfactorily met.

The danger to health lies not in the purified liquid that *has passed* through the various stages of putrefaction, but in the contact with the bacterial life *while passing* through the septic process.

The writer's well for ten years was within 15 ft. of a subirrigation drain from his residential septic tank and the water therein for the entire time was uncontaminated by its proximity. The reason for this would seem to be that, regarding the earth as a filter only, saying nothing of its ability to absorb, there is needed but a few feet in the thickness of it to render the septicised effluent absolutely odorless, colorless, tasteless and harmless. Now take into consideration the absorbing quality of the soil to take back into itself the original elements of nature that

came from it; it can be seen the possible water contamination from such source is very remote, if due attention is paid to the design and arrangement of the sanitary appliances in question.

As to the matter of cost of installing a residential septic tank and attendant arrangements, we answer: it need be but little in excess of what is usually required in equipping the premises with catch-basin and its outlet to the street sewer, and therefore should preclude almost no one from building this available convenience in order to have the use of modern residential conveniences in the house, sewers or no sewers, providing the necessary physical conditions heretofore mentioned exist in such a way as to be available.

Municipalities should court such or similar remedies and arrangements for the better service and sanitation of suburban districts for the sake of affording the desired relief of their importuning and deserving populace, since the whole proposition is infinitely to be desired above the slovenly method forced on the average suburbanite, namely, of casting the solid and fluid wastes of the household out upon the ground to fester in the sun, to be the feasting ground for the migratory fly which is likely to bring a part of the filth on its uncanny feet and deposit it on the chinaware or on the food on the dining table, and herein lies a real danger. By the adoption of these methods, the health officer will have fewer places of collected filth to condemn and to order removed; will experience less friction in securing sanitary conditions sought, and the healthfulness of the neighborhood will be enhanced by a degree that from the standpoint of saving human lives from violent zymotic disease can not be estimated.

While we would not be so bold as to argue that the residential septic tank when built would forever set aside the necessity of building sewer systems, yet we are at this time and by reason of many years of personal experience, ready to say that their introduction and use in smaller towns and in suburban districts would be the means of delaying the necessity of their construction for many years and yet give to the deserving householder the modern conveniences of city life as well as insure a greater degree of safety from enteric diseases referred to, and the entire arrangement being entirely underground, practically occupies no space to speak of.

But suppose we view this method of sanitation from the standpoint of a future introduction of sewers in the neighborhood, the effluent from these previously constructed tanks can easily be diverted into sewers with the effect of eliminating entirely the possibility of stoppage of the sewers by reason of its contained solids. In turn much of the necessity for flushing is avoided with its attendant reduction of cost of this expensive flushing or "rodding out".

And again, if the physical conditions surrounding the borders of the municipality should point toward the necessary installation of some form

of a municipal purification plant at the time when the introduction of sewers should occur, then it is not unreasonable to believe that the septicised effluent would, after its travel and aerification through the sewers, be so sufficiently purified by the time it reached the main sewer outlet, as to need no further treatment, and with the attendant result of saving the expense of building a purification plant, or of requiring only the building of at least nothing more than common filter beds.

XVI

PRACTICAL DISINFECTION

The following from a revised circular just issued by the Illinois State Board of Health is so compact and practical that with the permission of the Secretary, Dr. James A. Egan, I am pleased to reprint it. Attention is particularly called to the formaldehyde and potassium permanganate method so highly commended by the State Boards of Health generally. The readers of the Iowa Health Bulletin will recollect the warm endorsement given this method by the director of our Bacteriological Laboratory, Professor Henry Albert. We have not room for the entire paper but the excerpts presented will give a very good resume of the subject of practical and efficient disinfection to date. Speaking of the formaldehyde and potassium permanganate method Dr. Egan in a private note says, "I feel that it is the method—one that can be depended upon at all times and in all places,"—; and Dr. Albert says, "As Dr. Egan states I certainly believe that it is the method of disinfection."

PRACTICAL DISINFECTION

With the Results of Experimental Work Done in the Laboratory of the Illinois State Board of Health, in Formaldehyde Disinfection

GENERAL CONSIDERATIONS

The object of disinfection in the sick room is the destruction of infectious material attached to clothing, carpets, draperies, furniture or surfaces of the room, or deposited as dust upon the window ledges, in crevices, cracks, and other more or less inaccessible parts of the room. If the room has been properly cleaned and ventilated while still occupied by the sick person, and especially if it was stripped of carpets and unnecessary furniture at the onset of the attack, the difficulties of disinfection will be greatly reduced.

The work of disinfection should begin with the beginning of the treatment and should continue during the whole course of the disease. All articles of bed clothing and of body clothing should be disinfected as soon as they are removed from the bed or from the patient.

The liberal use of liquid disinfectants composed of chloride of lime, carbolic acid, or corrosive sublimate is strongly recommended in the sick room, but there should be no attempt to disinfect the room by any vapors or gases when occupied by the patient. This can not be accomplished. Fresh air, combined with absolute cleanliness, is the disinfectant most needed in the sick room.

During the entire illness the privy should be thoroughly disinfected with Standard Disinfection No. 1 (see page) four or five gallons of which should be thrown into the vault every day. Instead of the solution, chloride of lime in powder can be used. All woodwork in the vault should be soaked with the solution or covered with powdered lime. Water closets and sinks should be disinfected daily by pouring a quart or more of the solution of chloride of lime or carbolic acid into the pipes. The pipes should be freely flushed in order to avoid injury.

As unsanitary surroundings and uncleanness will tend to retard the recovery of the patient, every effort should be made to keep the house, cellar, outhouses and yard clean. The cellar should be freed of all rubbish and decaying matter and the walls whitewashed. All rubbish and decaying matter should be burned. Quicklime, Standard Disinfectant No. 4 (see page) can be well used to whitewash exposed surfaces and to disinfect sinks, drains, decaying matter too wet to be burned, pools of water, etc. Attempts should be made to draw off all pools of water.

In the disinfection of houses which have been occupied by those suffering from contagious or dangerously communicable diseases, much can be accomplished by the liberal use of liquid disinfectants, by thoroughly washing all woodwork and exposed surfaces, and by the burning of mattresses and pillows, by the removal of wall paper after saturation with disinfectants, and by treating carpets, hangings and other fabrics and exposing them in the fresh air and to sunlight.

The ideal disinfection would be one which would have no destructive effect upon the contents of the room, which would have such penetrating power as to be effective upon all infectious materials however inaccessible they might be and which could be applied with a minimum of labor. Such a disinfectant has never been found. Gases are decidedly limited as to penetrating power and are suited only for comparatively superficial disinfection. Liquid disinfectants are unavailable for many uses. It is consequently essential that we adopt both the aerial and the liquid disinfectants, and that we give such attention to every detail that no article and no part of the room escape being subjected to the suitable disinfecting agent in the most advantageous way.

AERIAL DISINFECTION

The most effective part of house disinfection, however, is accomplished by the liberal use of large quantities of disinfecting and germicidal gases, which impregnate the air, saturate the softer fabrics, and invade the most inaccessible and remote parts of the room. For this aerial disinfection the fumes of burning sulphur were formerly accepted by all health officers and sanitarians, but in more recent years formaldehyde gas has been used and exploited and has acquired a high degree of popularity.

Whatever the agent used for aerial disinfection with fumes of gases the following certain general rules are essential to success, and may be laid down for adoption both by those who adhere to sulphur as the disinfecting agent and by those who prefer and use formaldehyde gas.

(a) Have all windows and doors (except doors of egress) tightly closed. Securely paste strips of paper over keyholes, over all cracks, above, beneath and at sides of windows and doors, over stove holes, and all openings in walls, ceilings and floor. If the opening be large, paste several thicknesses of paper over it. Carefully stop up the fireplace, if there be one. There must be no opening through which gas can escape.

(b) All articles in the room that can not be washed should be spread out on chairs or racks. Clothing, bed covers, etc., should be spread on lines stretched across the room. Mattresses should be opened and set on edge. Window shades and curtains should be spread out at full length. If there is a trunk or chest in the room, open it but let nothing stay in it. Open the pillows so that sulphur or formaldehyde fumes can reach the feathers. Do not pile articles together.

(c) After the aerial disinfection is completed and the room opened, take out all articles and place them in the sunshine. Carpets should be well beaten and exposed to the sun.

(d) All wood surfaces in the room should then be thoroughly washed with Standard Disinfectant No. 3. (see page .) Wash well all out of the way places, window ledges, mouldings, etc. Floors particularly should receive careful attention and the solution should wet the dust and dirt in the cracks. If the walls are papered, soak the paper with the solution and have it removed.

(e) After washing, ventilate the rooms, if possible for several hours, then scrub all woodwork with soap and hot water.

(f) It is safer to burn mattresses and pillows.

(g) It is likewise safer to burn all books, toys and articles of little value which have been handled by the patient. Burn what you cannot boil or thoroughly wash. Books *which have not been in the room with the patient may be saved*. Lay them on edge of a table with leaves open, in room while sulphur fumes or formaldehyde gases are being generated.

It must be borne in mind that thoroughness of application is most essential, whatever method of disinfection may be adopted. Carelessness in the slightest detail may be productive of the gravest danger to those whose confidence has been inspired by the assurances of safety.

Although the patient suffering from contagious disease may have been confined to one room, it must not be forgotten that the avenues for the transmission of infective material to other parts of the house are never entirely shut off so long as there is any communication between the sick room and other rooms. Even the sheet, saturated with liquid disinfectants, which experience has taught us to hang over the open door of

the sickroom, may not serve as a barrier to all infectious material, especially if the nurse, the physician and members of the family pass frequently from the sickroom to other parts of the house. Hence, after cases of particularly contagious nature, not only the sickroom but all rooms contiguous to it should be thoroughly disinfected.

SULPHUR DISINFECTION

Disinfection by the burning of sulphur has been successfully practiced for many years. As stated by Surgeon General Sternberg, United States Army, "the experience of sanitarians is in favor of its use in yellow fever, small-pox, scarlet fever, diphtheria and other diseases in which there is reason to believe that the infectious material does not contain spores". This method of disinfection has also been endorsed recently by the United States Marine Hospital Service, after numerous experiments, during which the efficacy of sulphur disinfection, in the presence of moisture, was conclusively proven.

The results obtained by the Illinois State Board of Health, in the several experiments made, have been directly in line with those of other investigators. The burning of sulphur in the presence of moisture has been found an effective method of gaseous disinfection, and one upon which entire dependence can be placed at all times in disinfection after diseases due to micro-organisms not containing spores.

After the preparation of the room, as described, reliable and cheap disinfection may be secured by the following method of the use of sulphur.

(1) Use three pounds of powdered sulphur for every 1,000 cubic feet in the room. A room ten feet long, ten feet wide and ten feet high has 1,000 cubic feet. For a large closet use two pounds of sulphur.

(2) Burn the sulphur in an iron pot or deep pan. Let the pot or pan stand in a larger vessel containing water, which vessel should be placed on a table, not on the floor. For example, take a common wash tub, lay in it three or four bricks, pour in boiling water to the level of tops of bricks, put the pot or pan containing the required amount of sulphur on the bricks, place the wash tub and contents on a table. The disinfecting "apparatus" is then in working order.

(3) Moisten the sulphur with alcohol and ignite. When the sulphur begins to burn, leave the room, close the door of egress, and carefully paste strips of paper over the keyhole and all openings above, beneath and at sides of door. Keep the room closed for ten hours at least, twenty-four if possible.

Sulphur candles may be used instead of crude sulphur, but care must be taken to use sufficient candles. The average candle on the market contains one pound of sulphur. Three of these will be required in the disinfection of a small room 10x10x10. Do not use a less number, no matter what directions may accompany the candle. The water-jacketed candle is preferable. Partly fill tin around candle with water and place candles in a pan on the table, not on the floor. Let at least one-half pint of water be evaporated with each candle. Evaporate more if practicable. In the absence of moisture, the fumes of sulphur have no disinfecting power.

There is, however, one serious objection to the use of sulphur, and this must be fully understood. The fumes of sulphur (sulphurous acid) have a destructive action on the fabrics of wool, silk, cotton and linen, on tapestries and draperies, and exercise an injurious influence on brass, copper, steel and gilt work. Colored fabrics are frequently changed in appearance and the strength impaired. Fabrics, however, can be effectually disinfected by hanging them on a line exposed to the sun and wind for several days. Curtains and all articles of cotton or linen, boiling or soaking them in Standard Disinfectant No. 3, for several hours, and portable articles of brass, copper, steel and gilt work by washing with a strong solution of carbolic acid (Standard Disinfectant No. 1). Colored fabrics which have been in a room during disinfection should be immediately exposed to the sun and wind. Uncolored fabrics which will not be injured by moisture should be at once soaked in water. This action will prevent further injurious action of the sulphuric acid.

Sulphur will be found a thoroughly reliable gaseous disinfectant of considerable penetrating power, if it is intelligently employed. To obtain satisfactory results, the following essentials of successful disinfection, established by repeated experiments, must be observed: (a) The infected room, or rooms, must be thoroughly closed, every crack and crevice sealed. (b) Sufficient sulphur must be used. (c) There must be moisture in the room. (d) The time of exposure must be sufficient, ten hours the minimum.

In the disinfection of stores, halls, school houses and apartments or dwellings, in which there are no articles to be injuriously affected by the gas, sulphur is an ideal disinfectant. Its mode of application is simple (the simpler the mode of application the better), it is cheap, the material is accessible everywhere, and, finally, the most important or all the action will invariably found effective when the sulphur is properly used.

FORMALDEHYDE DISINFECTION

On account of the destructive properties of sulphur, efforts have been made to find a satisfactory substitute for this agent, one of equal germicidal power, which will not damage the contents of the room. If dependence could be placed on the published results of innumerable experiments made with formaldehyde, there would be no necessity for further search for the much desired substitute. Formaldehyde has been lauded as the most powerful sterilizer and germicide known; as a gaseous disinfectant far superior in efficiency to sulphur—one seemingly without limitations, effective at all times. The results obtained by careful observers in experiments made, not in laboratories, but in dwelling houses, shops and railroad cars, in which the disease is often found, do not substantiate the extravagant claims made for formaldehyde.

Formaldehyde (otherwise known as methyl aldehyde, formalcaldehyde and "formalin") exists in several forms, but is principally known as a gas. Its germicidal properties were not recognized until 1886, and were not put to use until 1890. The formaldehyde gas is the vapor of wood alcohol which has undergone a chemical change. The gas is produced by passing

the vapor of wood alcohol over platinum or platinized carbon in an incandescent state. Many portable apparatus for the production of formaldehyde gas directly from wood alcohol have been devised during the past ten years. The writer made a series of experiments in 1896-7, while connected with the Chicago Health Department, with the lamps then on the market. The tests were conducted in the most painstaking and careful manner, but in every instance the results were unsatisfactory. It was found that the lamps did not give off sufficient formaldehyde; that the alcohol was generated too slowly, and that large quantities of alcohol passed through the lamp unchanged. But few bacteria were killed by the gas evolved. There was consequently no disinfection. Not one of these lamps so highly endorsed in 1896 as ideal apparatus for the production of formaldehyde gas is now offered for sale. Experiments were made at the same time under the best possible conditions with the generator in which the fluid formaldehyde was boiled and vaporized. Disinfection failed in nearly all these experiments.

In 1898 the State Board of Health commenced experiments for the purpose of confirming or disproving the many claims made for formaldehyde by sanitary authorities at home and abroad, and incidentally for the purpose of finding a practical method of disinfection with this agent. These experiments were made under the direction of Professor T. J. Burrill, of the University of Illinois, and were continued at intervals until 1902. The results of the experiments are as indicated below.

The aqueous solution of formaldehyde gas, known as formaldehyde and "formalin", is a 40 per cent solution of the gas formaldehyde in water. It is claimed that many of the commercial preparations do not contain 40 per cent of formaldehyde. Several processes have been devised for the liberation of formaldehyde gas from its watery solution. The solution when exposed to the air gives off a considerable quantity of the gas, especially when sprayed on large surfaces. If the solution be sprayed on blankets or sheets or articles of clothing hung in the room or on the walls, the liberation of the gas will be so rapid as to compel the operator to leave the room. These facts have given rise to the belief that exposure of the gas in this manner will be sufficient to cause disinfection. The results, however, do not confirm this. There is much uncertainty as to the amount of gas which is evolved, and the behavior of the gas is at times capricious.

It has been determined by the United States Public Health Service after a series of extended experiments conducted by Past Assistant Surgeon M. J. Rosenau, that formaldehyde sprinkled on blankets and sheets has practically no disinfecting power in a closed box, excepting on the spot where the solution falls; this after a twenty-four hour exposure.

The amount of gas given off from the aqueous solution of formaldehyde at ordinary temperatures is exceedingly small. After the solution has been applied to exposed surfaces, the liquid becomes concentrated, and as found years ago by Surgeon J. J. Kinyoun of the United States Public Health Service, the greater proportion of the formaldehyde gas is converted into a yellowish white amorphous substance known as trioxymethylene. In this state it gives off but a slight amount of formaldehyde.

The evaporation of the solution of formaldehyde by the means of heat in an ordinary kettle is one of the simplest methods of disinfection with formaldehyde, and the results have proven effective. This method was indorsed by the writer in 1896. This is termed the Breslau method. Many health authorities have testified to its efficiency during the past eight years. To quote from the monthly report of the Chicago Health Department of January, 1898, in which this process is described at length and heartily endorsed: "A six hours' exposure under these conditions has given better results in the sterilization of cultures than has been obtained by any other method, and the other requirements—of simplicity and portability of apparatus, rapid evolution of the disinfecting agent and brief duration of exposure, together with reasonable cost of disinfection—are very nearly met."

A very simple apparatus for disinfection by this method was devised by the Health Department of St Louis in 1898. This consists of a copper kettle for the disinfectant, a tripod, and a copper vessel containing mineral wood for the alcohol. When the apparatus is placed in order the kettle is partly filled with hot water and the alcohol in the vessel beneath is ignited. As soon as the water boils there is poured into the kettle a quantity of the 40 per cent solution of formaldehyde, forty ounces being sufficient for the disinfection of 2,000 cubic feet of air space. In order to produce sufficient moisture, there is used in addition a similar apparatus in which water alone is boiled. The State Board of Health conducted many experiments with this apparatus, and the results have been generally satisfactory, and it is evident that the apparatus, when properly used, can, under favorable conditions, be relied upon to produce a proper amount of formaldehyde gas of the highest efficiency. After repeated tests made at intervals from 1899 to 1901, the Board feels justified in endorsing this method of disinfection with formaldehyde, with a proper apparatus.

To obtain proper results with this or any other apparatus it is absolutely necessary that the best formaldehyde or formalin be obtained. Much of the formaldehyde sold in the United States under different names cannot be relied upon. To be effective formaldehyde must contain not less than 38 per cent of strength. There is also much difference in the quality of wood alcohol found on the market. Alcohol 95 per cent proof must be used in this apparatus.

The best imported formaldehyde (formalin) was used in all the experiments conducted by the Illinois State Board of Health.

In disinfection with formaldehyde the same precautions relative to the sealing of the room should be taken as in disinfection with sulphur. It must be borne in mind also that the gas of formaldehyde, unlike that of sulphur, has but feeble penetrating power. There is no doubt, however, that the gas of formaldehyde will penetrate wherever infection has been carried by the surrounding atmosphere.

The State Board of Health conducted a number of experiments during the years 1899-1902 to test the efficiency of the so-called "sheet method" of disinfection, which consists of suspending sheets in the infected room, and spraying them with a solution of formaldehyde, using about six

ounces of the forty per cent. solution to each thousand cubic feet of air space. The results with this method have not been satisfactory. At times under favorable conditions the method proved effective, while again under almost identical conditions, it was found worthless, even when the amounts of formaldehyde on the areas of sheet surface were increased. At temperatures below 60° F. the results were invariably unsatisfactory.

To insure good results with this method it is absolutely necessary that the sheets be sprayed evenly in small drops over the entire surface, care being taken not to go over the same surface twice. Even the most enthusiastic advocates of the "sheet method" admit that the results will be unfavorable unless this precaution be observed. Formaldehyde is exceedingly irritating to the respiratory passages and to the eyes, so that it becomes a test of human endurance to remain in a room for the time necessary to properly spread sufficient solution to disinfect a very small space, while in a room of ordinary dimensions, which would require a number of sheets, the proper spreading of the solution by one man becomes a matter of utter impossibility.*

The ordinary disinfecter working under conditions so decidedly unpleasant will, in the majority of instances, slight his work, so that even if the sheet method were much more efficient than it is, the results of its practical application would seldom be satisfactory.

These conclusions have been reached by different State Boards of Health throughout the country, which have made personal investigations into the efficacy of this mode of disinfection.

Rosenau, of the United States Public Health Service, says, that the "sheet method" has distinct limitations and unless all necessary conditions are carefully observed, is very untrustworthy. The gas is given off very slowly and in very uncertain quantity, diffuses poorly in dead spaces and is entirely inapplicable to large enclosures. Even when conducted with the utmost care, the method is limited to rooms not exceeding 2,000 cubic feet.

In view of the fact that it is practically impossible for a disinfecter to properly spray the sheets, over a sufficient area to have effect in rooms of more than small dimensions; in view of the fact that there will be no disinfection unless the sheets be properly sprayed; in view of the fact that the method is utterly worthless at even reasonably low temperatures, and further in view of the unreliability of the method, indicated in the numerous failures to kill bacteria, even of feeble resisting powers, when technique seemed perfect and conditions favorable, the Illinois State Board of Health can not recommend its use to physicians or health authorities. "An effective method of disinfection must have no exceptions; it must invariably kill."

*LABORATORY INVESTIGATIONS. * * * Spraying a sheet with formaldehyde while the operator is standing in front of the sheet is a procedure claimed to be possible only by those who have never tried it, and describe it from imagination. * * After ten ounces had been sprayed further operation was rendered impossible by the unbearable, irritating vapor of the formaldehyde; * * Disinfection not obtained in experiments conducted;—*Bulletin of the Pathological and Bacteriological Laboratory of the Delaware State Board of Health.*

The most common method of obtaining formaldehyde gas from the watery solution at the present time is by means of apparatus designed to regenerate the gas by boiling the solution under pressure. Many generators operating on this principle are to be found on the market. Several of these are complicated machines requiring skill to properly operate. As some of the generators require constant attention, it has been found necessary to place them outside of the apartment being disinfected and to pass the gas into the room by means of a tube run through a keyhole. The diffusion of the gas produced in this way is slow, particularly in large areas, tending to its concentration at a few points and to the formation of paraform. This method of disinfection cannot be recommended. To insure a perfect disinfection with formaldehyde it is necessary that the gas be liberated quickly and in large volume.

Formaldehyde "candles" composed of paraform are now offered to health authorities as a means of disinfection. No dependence whatever should be placed on these candles.

THE METHOD RECOMMENDED

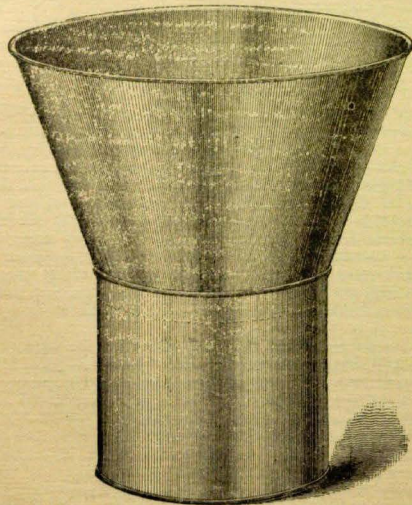
While the results obtained with some of the methods of formaldehyde disinfection formerly suggested have been generally satisfactory, failures were at times experienced when the conditions were apparently ideal, while under unfavorable conditions of temperature and humidity, in effective disinfection was of frequent occurrence. For this reason, while placing before the physicians and health officers of the state the best methods of formaldehyde disinfection, the State Board of Health has continued to advocate sulphur for aerial disinfection as the only agency which had demonstrated beyond question its efficiency and reliability at all times.

Aside from the uncertainty of results of the methods of formaldehyde disinfection offered for use, the apparatus has often been complicated in operation, unnecessarily expensive and dangerous as to destruction of property by fire.

An exceedingly simple method of generating the gas by pouring formaldehyde solution over the crystals of potassium permanganate in an open vessel, has been more recently suggested and gave promise of overcoming the objections which have stood in the way of the more general adoption of formaldehyde as a disinfecting agent. This method primarily offered the advantages of absolute simplicity in operation, requiring no special apparatus and no fire. In addition to this, exhaustive experimental work has demonstrated that, in practical disinfection, the method is unusually efficient, the effectiveness seeming to depend less upon the conditions of humidity and temperature than that of any other method.

The only apparatus required is a large open vessel, protected by some non conductive material to preserve the heat within. An ordinary milk pail, set into a pulp or wooden bucket will answer every purpose, although a special container, devised for physicians and health officers, will be found of considerable advantage. This container of generator consists of a simply constructed tin can with broad flaring top. Its full height is 15½ inches, the height of the flaring or funnel-shaped top being about 8 inches.

The lower or round section is ten inches in diameter, while the funnel top is 17½ inches in diameter at the top. This container is made of a good quality of tin, is supplied with a double bottom with a layer of asbestos between the layers of tin, and is entirely covered on the outside with asbestos paper. The asbestos paper and double bottom serve to effectively retain the heat which is generated by the vigorous chemical reaction occurring within the generator, and which is essential to the complete production and liberation of the gas. The special retainer can be made by any tinner of ordinary intelligence, and costs but a few dollars.



(Designed by the Maine State Board of Health.)

This method of aerial disinfection was first suggested in 1902-3, but it was given no publicity until 1904, when it was described by Dr. G. A. Johnson, of Sioux City, Iowa, in a paper read before the Sioux Valley Medical Association. Even then it attracted very little attention and was not subjected to systematic tests until late in 1904, when numerous experiments were made by the Maine State Board of Health.

The test-bacteria used in the experiments of the Maine board were diphtheria, typhoid, staphylococcus albus and aureus, coli communis,

pyocyaneus, tetrageus, streptococci, anthrax, subtilis, and mixed cultures mostly from swabs from the throats of patients thought to have diphtheria. The time of exposure was at first 16 hours, but this was gradually reduced to 3 hours with no lessening efficiency.

Of the 1,529 test objects exposed in 279 experiments, only twenty-seven showed a growth after incubation for at least 48 hours. Of these twenty-seven unsuccessful results, twenty-one were with the exceedingly resistant hay bacillus (*B. subtilis*). None of the bacilli of diphtheria, typhoid fever or other ordinary pathogenic germs survived the exposure to formaldehyde.

While placing great dependence on the results obtained by the Maine State Board of Health, the Illinois State Board of Health decided to pursue the policy adhered to since 1898, to make a systematic test of all methods of disinfection recommended before endorsing or condemning the methods.

During the summer and autumn of 1905 exhaustive experimental investigations were carried on with this method of disinfection in the laboratories of the State Board of Health at Springfield. An ordinary office room, containing 1,050 cubic feet of air space, was secured, situated conveniently to the laboratory. The door was carefully sealed with strips of gummed paper and access to the room was gained through an outer window. This window was not protected by paper strips, but set closely in its frame.

Twenty-four (24) hour bouillon cultures of various forms of bacteria were prepared. Strips of milk paper (½ in. x 2 in.) were saturated with these cultures. The slips were saturated in pairs, one slip being exposed to the fumes of the gas in the room, the other placed in a sterile envelope, sealed, labeled and kept in the laboratory to be used as a control. After the exposure of the first slip to the fumes of the gas generated by pouring the 40 per cent. formaldehyde solution over the permanganate of potassium in the usual manner, it was returned to the laboratory, both slips placed each in a tube of sterile bouillon, incubated at 37° C. for 48 hours, and later examined and compared.

On account of the variable results obtained by other methods of formaldehyde disinfection, depending largely upon the temperature and atmospheric conditions, days were selected for experimental work which varied greatly in temperature, humidity, cloudiness and other climatic conditions, and these conditions were made a part of the laboratory records.

Specimens were exposed for a period of 6 hours and, between experiments, the room was left open that it might be entirely freed of any traces of formaldehyde gas.

The results of experiments of the Illinois State Board of Health are shown in the tables on pages 19 and 20.

It will be noted in the tables of laboratory tests that the bacterial growth was entirely destroyed when one quart (32oz.) of formaldehyde was used to the 1,000 cubic feet of air space, and that equally satisfactory results were obtained with one pint (16 oz.) of formaldehyde. It may be consequently be stated that, under ordinary conditions of house

disinfection, the room being well sealed, a pint (16 oz.) of formaldehyde solution with 6½ oz. of potassium permanganate will be ample for 1,000 cubic feet of air space. With these amounts bacterial cultures, enclosed in from one to four layers of 4½ oz. flannel, were destroyed, these cultures including the bacillus subtilis (hay bacillus) known to be especially resistant to formaldehyde gas. It is not yet determined how small quantities of formaldehyde and permanganate of potassium will produce satisfactory results, but it is the part of wisdom not to economize in materials if there is the slightest danger of reducing the germicidal power. Even with the largest quantities named, a quart of formaldehyde to 13½ oz. of potassium permanganate, the cost is small.

It must be noted in this connection that the Maine State Board of Health adopted in its experiments the proportion of 6½ oz. of potassium permanganate to 32 oz. of formaldehyde for each 1,000 cubic feet of air space, and in a recent circular still recommends these amounts. However, as stated above, it has been the experience of the Illinois State Board of Health that under proper conditions, (at temperatures above 60° F.) one pint (16 oz.) of formaldehyde (the 40% solution) with 6½ oz. of potassium permanganate will be sufficient for the disinfection of 1,000 cubic feet of room space.

The results obtained with this method, in experiments conducted by the Illinois State Board of Health, under varying atmospheric conditions and with a rather wide range of temperature, indicate that there has been finally found a method of formaldehyde disinfection which will prove effective under reasonable conditions, at temperatures ordinarily found in the living or sleeping rooms, while the simplicity, the small expense of apparatus (in fact, its successful operation without apparatus of any kind, if necessary) and the moderate cost of operation serve to commend it. In the work of the State Board of Health the best quality of imported formaldehyde (formalin) was employed, and Merck's potassium permanganate, but even with the highest grade of materials the cost is small.

It must be borne in mind that the quantities of potassium permanganate and formaldehyde set forth above, should be used only when the temperature of the room to be disinfected is 60° F. or higher. The quantities to be used at lower temperatures are stated on page 27.

In this method of disinfection the following rules should be observed: The room should be sealed and prepared in the manner described on page 7.

The permanganate (6½ oz. for each 1,000 cubic feet of room space) should be first put in the apparatus or generator.

The formaldehyde solution (16 oz. for each 1,000 cubic feet of room space) should be then poured on the permanganate.

The permanganate must go in first.

As the formaldehyde gas is promptly liberated by the vigorous chemical reaction of the formalin and the potassic salt, and rises from the container in an immense volume, it is essential that all preparations

be made in advance, and that the operator leave the room at once on the combination of the two chemicals. The door or window of exit should be promptly closed and sealed, and the room left closed for six hours.

The room should be thoroughly cleaned after disinfection. All out-of-the-way places, window ledges, mouldings, etc., should be washed with Standard disinfectant No. 3. (See page 28.) The floors of the sick room should receive careful attention and the solution should wet the dust and dirt in the cracks.

The Generator—A few words as to the generator or apparatus required in this method of disinfecting. Whenever practicable the apparatus described on page 16, should be employed. The State Board of Health recommends that health officers keep a number of these on hand ready for immediate use.

When this apparatus cannot be obtained, use can be made of a milk pail. It is necessary that the top of the apparatus flare out like a funnel, so a milk pail should be selected. The pail can be set in a pulp or wooden bucket, if it fits snugly. If not it would be better to tightly wrap the sides and cover the bottom with two layers of asbestos paper, or if this cannot be got, with layers of blanket. It is absolutely necessary that all possible heat be retained in the generator, hence the necessity for a covering.

Capacity of Generator—Care must be taken not to put too much of the formaldehyde solution in the generator. Unless this precaution be observed, the solution will boil over and be wasted, besides causing a possible damage where it falls.

The following are the maximum quantities of the chemicals which can be safely used in the containers recommended by the State Board of Health:

Ten or 12 quart milk pail—	Formaldehyde, 16 oz.
	Permanganate, 6 ½ oz.
Fourteen quart milk pail—	Formaldehyde, 24 oz.
	Permanganate, 10 oz.
Apparatus on page 16—	Formaldehyde, 32 oz.
	Permanganate, 13 ½ oz.

FORMALDEHYDE AND POTASSIUM PERMANGANATE METHOD OF DISINFECTION

RESULTS AT LOW TEMPERATURES

As stated in the first edition of this circular, which was issued at the conclusion of the experiments in practical disinfection undertaken in 1905, it had been the experience of the State Board of Health that formaldehyde, however generated, often failed to accomplish satisfactory disinfection if used at a temperature below 60° F. This had been the personal experience of the secretary in 1896-1897, when he tested

the Robinson, Moffatt, Kuy-Schrer and Hollister lamps and the Trillat and the Sanitary Construction Company's autoclaves, constituting all forms of apparatus on the market at that time. In these earlier experiments some of the test organisms were killed when the room temperature was sufficiently high, but there was uniform growth of cultures when the temperature was below 60° F. It then appeared that, as with chlorine, the germicidal power of formaldehyde was increased by high temperature and was materially reduced by cold.

These early results were confirmed in the exhaustive tests made by the State Board of Health from 1898 to 1902, and it was then apparent that the action of the gas was modified not only by temperature and humidity, but by some other factors not fully understood.

While the experimental work of the State Board of Health of 1898-1902 led to the establishment of a method of formaldehyde disinfection which was satisfactory under ordinary conditions (see page —), many of the problems of aerial disinfection with formaldehyde remained unsolved. Neither the question of proper temperature nor of proper humidity could be satisfactorily settled, and as the majority of investigators adhered to the belief that disinfection with formaldehyde was impracticable at low temperature, the Illinois State Board of Health* deemed it the part of wisdom to advise the use of sulphur at any temperature below 60° F.

It might be appropriately stated here, that in the 279 experiments conducted by the Maine State Board of Health, the temperature varied from 67° F. to 80° F.

It would appear in the light of the results of the experiments undertaken in 1906 by the Illinois State Board of Health, that successful disinfection with formaldehyde is not so much a question of either temperature or humidity as one of the proper method of the generation of the gas. The results of the most recent experiments are tabulated on page —, and these show that as satisfactory results were obtained at a temperature of 20° below the freezing point as at midsummer heat; and on seemingly unfavorable days as on those when perfect disinfection might be looked for.

These facts were clearly demonstrated in the first fifteen of the recent experiments, (Experiments Nos. 1 to — page —) in which the ordinary bacterial tests were carried out with the utmost accuracy by two thoroughly competent bacteriologists, who personally superintended every detail of the work, from the preparation of the cultures to the final laboratory examination, including the preparation of the test-room and the generation of the formaldehyde gas. The final tests (Experiments 1-5, page —), show results that are even more convincing and gratifying, as in these experiments the gas was put to the severest disinfecting tests suggested from any quarter.

For the purposes of experimental disinfection, an ordinary office room having a capacity of 3,500 cubic feet was secured. This room contained two large windows and one door, and these, fitting rather snugly, were not sealed in any of the tests. In the first fifteen experiments, strips

of bibulous (milk) paper saturated with twenty-four hour bouillon cultures were used, and exposed at various heights in different parts of the room. These slips were kept in the room for six hours during the liberation of the formaldehyde gas and were then taken to the laboratory in tubes of sterile bouillon. These tubes, together with tubes inoculated with control culture slips, which were used in every instance, were then placed in the incubator for a period of forty-eight hours. It may be noted that bacteria of the most resistant character were used and further, that cultures made from the control slips invariably showed profuse and healthy bacterial growths.

The almost entirely uniform results of these experiments, consisting of 80 culture tests, taken with the 290 culture tests made in 1905, indicate conclusively that we now have in the potassium permanganate-formaldehyde method of disinfection, one which is easily applied, which is of almost nominal expense, and one upon which we may place dependence at all times and under all conditions.

That the method should be subjected to the severest tests however, an effort was made to ascertain those conditions which, in the opinion of competent observers, were liable to lead to failure or to unsatisfactory results in practical disinfection, and the final tests shown on page — were made under these conditions. Various writers had questioned the power of formaldehyde to penetrate cloth, hangings or drapings; others had doubted the disinfecting powers of formaldehyde on articles in the lower-most parts of the room, especially when covered with carpet or matting. Dr. Hibbert Winslow Hill, of the Minnesota State Board of Health Laboratories had cited (*) as sources of error in testing gaseous disinfectants, the following points: (a) That freshly dried bacterial cultures are more highly resistant than moist specimens or those dried a week or more. (b) That freshly dried specimens (24, 48, 72 and 96 hours), particularly, if dried on hard material are especially resistant.

It will be noted that in the final group of experiments this method of disinfection was subjected to the severest tests under most unfavorable conditions, but in spite of this the results differed little if at all.

The paper slips were placed under carpets and others wrapped in four or five layers of flannel, and while the results in these tests were all negative they were such as to indicate that formaldehyde gas, properly generated, has greater penetrating power than formerly believed.

*The Journal of Infectious Diseases, Sup. No. 2, February, 1906, p 210. from the former tests. Hard-wood butchers' skewers were used in all of the final tests as well as milk paper slips and the cultures on these skewers and slips were dried 24, 48, 72 and 96 hours. The results were eminently satisfactory. The results with the freshly dried specimens, dried on hard material, were remarkable when we consider that the exceedingly resistant bacilli (*B. anthracis* and *B. subtilis*) failed to survive.

The only absolute failures in disinfection were in those tests in which culture slips were placed between the leaves of books, and, in such instances bacterial destruction could not reasonably be looked for.

These results certainly corroborate the previous findings of the State Board of Health.

Quantities of Chemicals—In view of the difficulties heretofore attendant upon efforts made to secure satisfactory disinfection at low temperatures, it was thought advisable to use in all cases the maximum amount of formaldehyde employed in previous experiments. (See page —. Through an error of calculation, however, made after the completion of the second test the amounts were diminished, but, as will be noted the results were unchanged. Whether success would have been attained had the amounts used been further decreased it is impossible to say. However, a further decrease is not necessitated for reasons of economy nor can it be recommended. The quantities of formaldehyde and potassium permanganate to be used at varying temperatures are set forth on page —.

"The true principle of disinfection is to attack the specific poisons of disease at their seats of origin as far as these are accessible to us."—*Notter-Horrocks*.

"It is a maxim universally agreed upon in agriculture, that nothing must be done too late; and again, that everything must be done at its proper season, while there is a third precept which reminds us that opportunities lost can never be regained."—*Pliny*

"Cleanliness is an important adjunct to the work of disinfection.

"Cleanliness accomplishes another important purpose as far as infection is concerned; it removes the organic matter on which and in which the bacteria find favorable conditions for prolonging life and virulence."—*Rosenau*.

"Disinfectants, or germicides, are agents which bring about the destruction of bacteria in general and, more particularly, of those that act as the exciting causes of disease. While they are all to be classed as antiseptics, the latter, as a class are by no means necessarily disinfectants, since many of them act simply to delay or prevent the action of fermentative agents, without exerting any destructive influence upon them. Cold, for example, is a most efficient antiseptic; but while it may inhibit growth and activity of micro-organisms, it does not necessarily deprive them of vitality."—*Harrington*.

FINAL RECOMMENDATIONS

The Illinois State Board of Health now recommends formaldehyde as an aerial disinfectant, when used in combination with potassium permanganate, in the manner described in this circular.

The following quantities of chemicals should be used for each 1,000 cubic feet of air space:

Temperature above 60° F.—Formaldehyde (40%), 16 ounces.

Potassium permanganate 6½ ounces.

Temperature below 60° F.—Formaldehyde (40%) 24 ounces.

Potassium permanganate 10 ounces.

The following suggestions are important and may prevent failure in the application of this method of disinfection.

1. Good formaldehyde is essential to success. Reliable formaldehyde or formalin is not very expensive; poor formaldehyde is dear at any price. (See remarks on pages — and —.) Get the best!

2. The permanganate of potassium must be in powdered form, or in long needle shaped crystals. If the large octahedral crystals are purchased, they must be powdered before use. Get the best!

3. The retention of the heat caused by the reaction of the combined chemicals is necessary to the generation of a large volume of gas. Hence it is necessary that the metal container or generator be covered with asbestos, or with a non-conductive outer vessel.

4. As the union between the chemicals causes much frothing and effervescence, large vessels are necessary to prevent the solution from running over. The amounts of the chemicals set forth on page — should never be exceeded in vessels of the size mentioned.

5. The formaldehyde solution must be poured upon the potassium permanganate. The potassium permanganate must not be dropped into the formaldehyde.

6. The room should be sealed so as to prevent the escape of gas.

7. Clothing, bedding, etc., must be treated as described on page 7.

8. It is always well to wash the wood surfaces of the room, as described on page —. It is absolutely necessary to do so when such surfaces have been soiled by the sputum or any other discharges of the patient.

9. It is not practicable to disinfect books with formaldehyde.

The following are simple, cheap and most reliable Disinfectants:

STANDARD DISINFECTANT NO. 1

Four per cent. Solution of Chloride of Lime

Dissolve Chloride of Lime of the best quality, in water, in proportions of six ounces of lime to one gallon of water.

This is one of the strongest disinfectants known. Discharges from the bowels of a patient suffering from a contagious or infectious disease, should be received in a vessel containing this solution, and allowed to stand for an hour or more before being thrown into the vault or water closet. Discharges from the throat or lungs should be received in a vessel containing this solution.

Chloride of lime in powder may be used freely in privy vaults, cess pools, drains, sinks, etc.

Instead of the solution of chloride of lime, carbolic acid may be used for the same purposes, in a strength of $6\frac{1}{2}$ ounces to the gallon of water. This makes a five per cent solution of carbolic acid.

Milk of Lime (Quicklime)

Slack a quart of freshly-burnt lime (in small pieces) with three fourths of a quart of water—or, to be exact, 60 parts of water by weight with 100 of lime. A dry powder of slack lime (hydrate of lime) results. Make milk of lime not long before it is to be used by mixing one part of this dry hydrate of lime with eight parts (by weight) of water.

Air slacked lime is worthless. The dry hydrate may be preserved some time if it is enclosed in an airtight container. Milk of lime should be freshly prepared, but may be kept a few days if it is closely stoppered.

Quicklime is one of the cheapest of disinfectants. This solution can take the place of chloride of lime, if desired. It should be used freely, in quantity equal in amount to the material to be disinfected. It can be used to whitewash exposed surfaces, to disinfect excreta in the sick room or on the surface of the ground, in sinks, drains, stagnant pools.

NOTES CONCERNING INSECTICIDES

A few words here regarding the agents which can be depended upon to destroy vermin will certainly not be out of place.

Some authorities have recommended formaldehyde as an insecticide. Those who have personally experimented with this agent know that it cannot be depended upon to even kill mosquitoes in a room. Formaldehyde gas is but a feeble insecticide at best. It is never efficacious except when the gas is generated quickly and in large volume. Even then the results may be disappointing.

Formaldehyde has ordinarily but little penetrating power. Usually the gas will not reach the folds of bedding and clothing, and out-of-the-way places in which vermin are prone to hide.

As to sulphur, which is not only a reliable disinfectant, but also a powerful and reliable insecticide, the following remarks of Surgeon M. J. Rosenau, Director Hygienic Laboratory U. S. Public Health Service, will be interesting:

"Sulphur dioxide is unexcelled as an insecticide. Very dilute atmospheres of the gas will quickly kill mosquitoes. It is quite as efficacious for this purpose when dry as when moist, whereas the dry gas has practically no power against bacteria. Contrary to formaldehyde it has surprising powers of penetration through clothing and fabrics, killing the mosquitoes, even when hidden under four layers of toweling, in one hour's time—and with very dilute proportions.

"This substance, which has so long been disparaged as a disinfectant because it fails to kill spores, must now be considered as holding the first rank in disinfection against yellow fever, malaria, filariasis, and other insect-borne diseases."

XVI.

JUDICIAL OPINIONS AND COURT DECISIONS

IN THE SUPREME COURT OF THE STATE OF IOWA

State of Iowa, vs. J. C. Wilhite, appellant.

Appeal from the district court of Webster County.

J. H. Richard, Judge.

The indictment charged that the accused did wilfully and unlawfully practice medicine and then and there did publicly profess to cure and heal the diseases and ailments to which the flesh is heir by means of a certain system, a more particular description of the peculiar and mysterious workings of which are to this Grand Jury unknown; that said J. C. Wilhite then and there did advertise in the Fort Dodge Messenger that by said system he could cure and heal tuberculosis and cause the same to be cured and did advertise in said paper that he is a Doctor of Neurology and Ophthalmology with an office at No. 526 1-2 Central Avenue in Fort Dodge, Iowa, with office hours from 9 to 12 and 1:30 to 4:00, that said Wilhite did then and there maintain such office and had placed near the entrance to such place an advertisement sign containing the words, "Dr. Wilhite, Neurologist", and by means of such advertisement did solicit persons to meet him at his office to participate in the beneficent results arising from treatment under his said system; that said J. C. Wilhite did then and there undertake to cure and heal diseases and ailments and that said J. C. Wilhite then and there did not have a certificate nor a license from the proper authorities so to practice, nor did he file with the county recorder of Webster county, Iowa, any such certificate to practice and has never applied therefor. The defendant was convicted and appeals.

Mitchell & Hackler for appellant

Chas. W. Mullan, Att'y Gen., B. J. Price, County Att'y, for the state.

Ladd, J.—Before the trial defendant objected to the indictment on three grounds: (1) for that it did not charge any offense under the laws of this state, (2) it was so indefinite as not to inform the accused of the charge against him and (3) it attempted to charge several distinct and separate offenses. Though inartistically drawn it is not open to any of these criticisms. It specifically alleges that the defendant practiced medicine, then averred his acts which constituted so doing and that this was without a certificate from the proper authorities. It may be that the acts were set out with more particularity than was essential but at the most this amounted to no more than pleading evidence. Section 2550 of the code provides that "Any person who * * * shall practice medicine, surgery or obstetrics in this state without first having obtained and filed for record a certificate from the State Board of Medical Examiners shall be punished. Section 2579 of the code declares that "any person shall be

held as practicing medicine, surgery or obstetrics, or to be a physician, within the meaning of this chapter, who shall publicly profess to be a physician, surgeon or obstetrician, and assume the duties, or who shall make a practice of prescribing or of prescribing and furnishing medicine for the sick, or who shall publicly profess to cure or heal": Here follow certain exceptions not involved in this case.

The evident object of the plea was to allege acts of the accused which would bring him within the definition of the section last quoted. To accomplish this the indictment alleged: (1) that he publicly professed to cure and heal by means of a system unknown to the grand jury; (2) that he advertised so to do in a certain newspaper; (3) that he maintained an office with the sign of a doctor for this purpose and (4) that he actually undertook to cure and heal. These acts are not charged as separate offenses but as contemporaneous acts which considered together constituted the practice of medicine. The indictment as it alleged but the one offense and pointed out the person accused was sufficient. See 5290 Code.

II.—Dr. Kime testified that "Dunglison's Medical Dictionary, Revised edition" is accepted by the medical profession as authority in the definition of words and thereupon the definitions of "Anatomy", "Neurology", "Ophthalmology", "Pathology" and "Physiology" contained therein were introduced in evidence, over defendant's objection. Even though the court might have taken judicial notice of the meaning of these words it was not error to receive a standard medical dictionary in evidence as an aid to the memory and understanding of the court. *Cook vs. State*, 20 So. (Ala.) 360. See *Nix vs. Hedden*, 149 U. S. 304; 37 L. Ed. 745. *State vs. Main*, 69 Conn. 123; 61 Am. St. 30; 36 L. T. A. 623; *Note to Lanfear vs. Mestier*, 89 Am. D. 603. *Bixby vs. R'y Co.*, 105 Iowa 293, and like cases are not in point. They hold that medical works, treating of the symptoms and cure of disease, are not admissible, nor that standard authorities may not be received as proof of the meaning of medical terms.

III.—The considerations now urged by counsel against the constitutionality of the statutes were pressed upon the court's attention when *State vs. Heath*, 125 Iowa 585 was decided. See also *State vs. Bair*, 112 Iowa 466. We are not inclined to reconsider the conclusions reached in these decisions.

IV.—Complaint is made of the 6th paragraph of the charge. It has the support of *State vs. Heath*, supra, and *State vs. Edmunds*, 127 Iowa 333. Instructions must be construed with reference to the evidence introduced and when this is done no valid objection appears to that given. The evidence established the defendant's guilt. True he modestly ascribed to nature the healing of all diseases and merely claimed to discover and remove the causes so as to give nature a chance. To accomplish this he proposed to "stop the leaks in the nervous system and repair the damages done, by methodical rest and dietetics". In a long creed criticising

the treatment of disease by physicians generally published in a local paper he announced himself "the master mechanic of the human body" and added: "The system I practice is taught in but one school in the world and I am a graduate of that school." And proceeded:

If your organs are not all working properly call on a master mechanic who will remove the cause. If there is a leak of power he stops it. If there is a pressure on some of the shaftings (or nerves) causing a hot box (or pain) he removes it. If the right fuel has not been used, he orders the right kind and if the fireman does not know how to fire he teaches him or her the business.

And after quoting a letter said to have been received from a patient said:

I do not claim to be a specialist on tuberculosis any more than a great many, (in fact almost all) so-called diseases that the medical men and other specialists have not been able to do much for in the way of curing, this system gives a permanent cure. We prefer those who have tried other systems. In that way we prove the system I practice is the best because we get good results. We do not care much what your troubles are if you want to get well and stay well.

Dr. J. C. Whitlitz, 523 1-2 Central Avenue,
Fort Dodge, Iowa.

This was a public profession to cure and heal. *State vs. Heath*, supra. Publishing his card as "Doctor of Neurology and Ophthalmology" was also a public profession that he was a physician and this with the assumption of duties as such, by advising patients how to take care for themselves so that nature might affect a cure constituted practicing medicine within the meaning of the statute.

See *O'Neil vs. State* 3 L. R. A. (N. S.) 762 and note.

V.—Appellant complains that if he be adjudged guilty there are others equally so and many are enumerated who, as counsel seems to think, must come beneath the ban of the law. It will be time enough to determine each case when it reaches us and should some escape it may afford the accused some consolation to reflect that also at the fall of the tower of Babel those who escaped were quite as great sinners as the eighteen who were crushed beneath its walls. At any rate the zeal of the prosecutor was not misdirected in the case at bar. The "doctor" left the farm in 1902 and after studying at the "Northern Illinois College of Ophthalmology and Otology" two months was awarded the degree of "doctor of optics". He then pursued a correspondence course in the same school during the summers of 1902 and 1903 and became entitled to a "master diploma" upon the payment of \$10.00. Thereafter he took a "regular course" of three months at the "McCormick Neurological College" and became a "doctor of Neurology" March 1, 1905. Aside from this he has read several articles in the magazines and a couple of works on the eye. No argument is required to demonstrate that his preparation was utterly inadequate, and that his pretensions savored of the charlatan and impostor. Even though familiar with his alleged "system" he could not have been reasonably proficient in those subjects essential to the appreciation of physical conditions to be effected by treatment. The design of the

law is not to render any mode of treatment whatsoever unlawful but that every one before he shall undertake to prevent, cure or alleviate diseases and pain as an occupation shall have some knowledge of the nature of disease, its origin, its anatomical and physiological features, its causative relations and of the preparation and action of drugs. Experience has shown that this is necessary for the protection of the people against fraud and empiricism. No one is thereby deprived of the opportunity to exploit his "system". All that is exacted is that before undertaking to do so by applying it to the functions of life he shall be possessed of that degree of knowledge and skill required by the statute of all and evidenced by a certificate from the proper officers of the state. The judgment is affirmed.

POWER OF HEALTH BOARDS TO DESTROY INFECTED BOOKS

Des Moines, March 29, 1904.

DR. J. F. KENNEDY,

Secretary State Board of Health.

DEAR SIR:—

I enclose you a letter from Mr. Fred Reynolds, which will explain itself. I have no doubt of the power of the board of health to destroy school books which are so infected as to be likely to spread contagious diseases. The power to destroy such books exists the same as the power to destroy any other infected property, and should be done by the local board of health, and the cost of replacing such books should be borne by the township.

I have said to Mr. Reynolds that his letter is referred to you and that you will write him upon the subject.

Yours very truly,

CHAS. W. MULLAN.

COMPENSATION OR REGISTRARS OF CITIES OF TEN THOUSAND OR MORE INHABITANTS

SIR:—

Replying to your favor, enclosing letter of Strong & Whitney of Sioux City, in which my opinion is asked as to the compensation to which the registrar of vital statistics in cities exceeding ten thousand in population, is entitled, I beg to say:

Section 2 of chapter 100 of the acts of the Thirtieth General Assembly provides:

"Local registrars of vital statistics shall be the health officers of cities and the clerks of townships."

Under this provision of the statute the health officer or every city in the state is made the local registrar of vital statistics.

Section 6 of the act, which provides for the compensation which such local registrars are entitled to receive, contains this provision:

"Provided further, that city registrars of cities having ten thousand population or more by the last U. S. census, shall receive no special compensation, other than that included in their salaries, for acting as registrars under this act."

The thought which appears to have been in the minds of the legislators in enacting this provision is that the health officers in cities having a population exceeding ten thousand, would receive, from the cities in which they are appointed, a salary sufficient to compensate them for the duties imposed by chapter 100 of the acts of the Thirtieth General Assembly; and that they should receive no other compensation for that work than the salary so fixed by the local authorities.

Respectfully submitted,

CHAS. W. MULLAN.

Attorney-General of Iowa.

January 24, 1905.

DR. J. F. KENNEDY,

Secretary State Board of Health.

WHO ARE REGISTRARS OF VITAL STATISTICS?

Des Moines, August 4, 1904.

DR. J. F. KENNEDY,

Secretary State Board of Health.

DEAR SIR:—

I am in receipt of your favor of the 3d instant asking for an interpretation of section 2 of chapter 100 of the Laws of the Thirtieth General Assembly. In reply will say that the provisions of this section appear to be plain in their meaning. It provides that the local registrars of vital statistics shall be the health officers of cities, and the clerks of townships. The construction which must be placed upon this language is that the health officer of each city shall be the registrar of vital statistics within that city, and the clerk of each township shall be the registrar of vital statistics within the territory of that township outside of incorporated cities. The language is susceptible of no other construction.

I am,

Yours very truly,

CHAS. W. MULLAN.

THE LEGAL DUTIES OF BOARDS OF HEALTH*

BY CHARLES W. MULLAN, ATTORNEY GENERAL.

The topic upon which I have been requested to make an address is The Legal Duties of Boards of Health of the State. An address upon this subject must of necessity be brief, as no general rule or set of general rules can be laid down which shall be applicable to each individual case.

The action of each board of health in the state must rest upon the facts involved in the particular case as to which it is called to act. While this is true, yet every member of each board of health within the state must constantly have in mind the fact that he is appointed to the place which he holds for the purpose of protecting the health of the general public.

The powers of boards of health are conferred by statute and the powers which may be legally exercised are those expressly conferred, and such other incidental powers as are necessary to the complete exercise of those expressly given.

Section 2508 of the code provides that the state board of health shall have charge of and general supervision over the interests of the health and life of the citizens of the state; matters pertaining to quarantine; registration of marriages, births and deaths; authority to make such rules and regulations and sanitary investigations as it from time to time may find necessary for the preservation and improvement of the public health, which, when made, shall be enforced by local boards of health and peace officers of the state.

This statute confers almost unlimited, and perhaps in a degree, arbitrary powers upon the state board of health.

The rules and regulations which it is authorized to make are limited only in that they must be reasonable, and the reasonableness of such rules and regulations depends in a large degree upon the facts involved, and the actions necessary to protect and promote the public health. The power which may be exercised by boards of health is, of course, a part of the police power of the state, and this power, which is now so firmly settled as an important branch of the laws of this country, is of comparatively recent origin. There is no trace in the books before the early part of the century just closed of the use of the expression "police power" as substantially equivalent to the power of legislation; but that power is now recognized by all of the various courts of this country and England as one of the important powers belonging to the people of each sovereign state, and which cannot be bargained or trafficked away by themselves or their representatives in the state legislatures.

*Read before the Conference of the Iowa Association of Health Officers and the State Board of Health at Waterloo, July 10th, 1905.

This power has been so aptly defined in a recent case by Judge Harlan of the supreme court of the United States, that I quote from his opinion:

"The police power includes all measures for the protection of the life, the health, the property and the welfare of the inhabitants, and for the promotion of good order and public morals. It covers the suppression of nuisances, whether injurious to the public health, or to the public morals, like gambling houses and lottery tickets. This power being necessary to the maintenance of the authority of local government and to the safety and welfare of the people, is inalienable. As was said by Chief Justice Waite, referring to earlier decisions to the same effect 'No legislation can bargain away the public health or the public morals. The people themselves cannot do it, much less their servants. The supervision of both of these subjects of governmental power is continuing in its nature and they are to be dealt with as the special exigencies of the moment may require. Government is organized with a view to their preservation and cannot divest itself of the power to provide for them. For this purpose the largest legislative discretion is allowed, and the discretion cannot be parted with any more than the power itself. The police power extends not only to things intrinsically dangerous to public health, such as infected rags or diseased meat, but to things which, when used in a lawful manner, are subjects of property and commerce, and yet may be used so as to be injurious or dangerous to the life, the health or the morals of the people. Gunpowder, for instance, is a subject of commerce and of lawful use, yet, because of its explosive and dangerous quality, all admit that the state may regulate its keeping and sale.

"All rights are held subject to the police power of the State. Whatever differences of opinion may exist as to the extent and boundaries of the police power, and however difficult it may be to render a satisfactory definition of it, there seems to be no doubt that it does extend to the protection of the lives, health and property of the citizens, and to the preservation of good order and the public morals, and the legislature cannot, by any contract, divest itself of the power to provide for these objects. They belong emphatically to that class of objects which demand the application of the maxim, *salus populi suprema lex*; and they are to be attained and provided for by such appropriate means as the legislative discretion may devise. That discretion can no more be bargained away than the power itself."

In this state, acting within the scope of its legal authority, the legislature has conferred upon the state board of health the right to make such rules and regulations as from time to time it may find necessary for the preservation and improvement of the public health; and has made it the duty of the local boards of health and of the peace officers of the state to enforce such rules and regulations. It is just as much the duty of the local boards of health and of the peace officers of the state to enforce the rules and regulations of the state board of health as it is to perform any other duty pertaining to the offices which they hold. And the members of such local boards of health and the peace

officers of the state should be held to just as strict an accountability in the enforcement of such rules and regulations as they are in regard to any of the other duties of their respective offices.

In addition to the statute referred to, the twenty-ninth general assembly enacted a law which provides that if any local board of health shall refuse to enforce the rules and regulations of the state board of health, the state board may enforce its rules and regulations within the territorial jurisdiction of such local board; and for that purpose the state board shall have and may exercise all of the powers given by the statute to local boards of health.

The act further provides that the peace and police officers of the state, when called upon by the state board of health to enforce its rules that all expenses incurred by the state board of health in determining whether its rules and regulations are enforced by a local board, and and regulations, shall execute the orders of such board. It also provides in enforcing the same when the local board has refused or neglected to do so, shall be paid in the same manner as is provided for the payment of the expenses of enforcing such rules and regulations by the local boards of health.

The high importance of the enforcement of all the rules and regulations of the state board of health may be gathered from these statutory enactments which are emphatically mandatory in their character.

We now turn more directly to the duties of the local boards of health and of the local health officers, because upon them depends in a high degree, the health and comfort of the local communities. They constitute a part of the community in which they hold office; they are in touch with the local surroundings and conditions. If the sanitary conditions of the city or town in which they live are bad, they have knowledge of that fact. If an epidemic of a contagious disease threatens, they are at once informed of it. If adulterated food or diseased meat is offered for sale, they are or should be informed of such fact. If a nuisance exists which is detrimental to the health of the community, they are not ignorant of its existence.

The power to act in all such cases, and in others not specified, is not only conferred upon the local boards of health by the statute, but the law makes it their duty to take prompt and decided action.

Section 2568 of the code imposes upon such boards the duty of making such regulations as are necessary for the protection of the public health respecting nuisances, sources of filth, causes of sickness, rabid animals and quarantine, not in conflict with any regulation of the state board of health; and to proclaim and establish quarantine against all infectious or contagious diseases dangerous to public health, and maintain and remove the same as may be required by the regulations of the state board of health.

The statute also imposes upon them the duty of making an examination of any cellar, room, tenement, building or place occupied as a dwelling or otherwise, for the purpose of ascertaining whether the same is by reason of the number of occupants, uncleanness, or other cause, unfit for the purposes for which it is used; and if they find that it is,

they may require it to be put in proper condition by the occupants, or may require them to remove or quit the premises within a reasonable time, and if the persons occupying such premises neglect or refuse to comply with the order of the board, it may cause the premises to be properly cleaned at the expense of the owner, or may forcibly remove the occupants and close the premises.

These powers with the power to make and enforce such regulations as are deemed necessary for the protection of the public health, may be and undoubtedly are sometimes thought to be arbitrary powers so exercised by the local board of health, but it is the history and experience of all legislation upon the subject, that every board of health and every health officer must of necessity be clothed with powers which may be at times arbitrarily exercised.

There is something peculiar in the character of men and woman generally, which resents any attempt upon the part of another person, whether he holds an official position or not, to better their condition. This thought recalls an incident related by a noted English author of the attempt of the owner and operator of a great factory in England to ameliorate and better the condition of his workmen. He discovered that the lungs of the saw grinders who were using dry stones, were affected by the dust which came from the stones upon which they were at work. In order to relieve them of this danger, he provided fans by which the dust was blown in an opposite direction. His action was declared to be an innovation upon the time honored method of grinding saws in the factories of England, and the workmen refused to proceed with their work unless the fans were removed, and when the owner persisted in maintaining the fans at the grind stones, the workmen walked out of the factory.

The local boards of health and health officers necessarily meet and have to contend with this peculiarity of human nature. Their work, therefore, must be to a large degree educational in its character. The ignorant must be taught the necessity of sanitation and of quarantine against the spread of contagious diseases, and the obstinate must be taught by a rigid enforcement of the law that the public health is a matter of first consideration to the community. The responsibilities which at times devolve upon the local boards of health and upon the health officers, are so serious as to test their judgment, integrity and courage to the utmost. When these tests come, they must be met with a fortitude and firmness that shall command the respect and obedience of those against whom the enforcement of the rules and regulations adopted for the preservation of the public health, is necessary; and frequent association and conference of the members of the respective boards of health and of the health officers of adjacent cities and towns will give them confidence which will direct their judgment and enable them to act with firmness and decision.

The fear of expense should never stand in the way of the enforcement of measures which are necessary to the public health. Penuriousness has no place in the code of the local boards of health. If action is demanded, it should be thorough and to the end that the disease or source of danger which called it forth, should be absolutely eradicated and stamped out. The question of expense is of no importance compared with the question of the public health. Every contagious disease should be confined to the smallest possible number of people and to the smallest possible area of territory. A quarantine should be one in fact as well as in name. As illustrating this general principle I quote from the opinion of the United States supreme court in a case recently appealed from California:

"The purpose of quarantine and health laws and regulations with respect to contagious and infectious diseases, is directed primarily to preventing the spread of such diseases among the inhabitants of localities. * * * In this respect these laws and regulations are under the police power of the state and may be enforced by quarantine, and health officers in the exercise of a large discretion as circumstances may require. The object of all such rules and regulations is to confine the disease to the smallest possible number of people; and hence, when a vessel in a harbor, a car on a railroad, or a house on land is found occupied by persons afflicted with such a disease, the vessel, the car, or the house, as the case may be, is cut off from all communication with the inhabitants of adjoining houses or contiguous territory, that the spread of disease may be arrested at once and confined to the smallest possible territory."

I am aware that the vexed question as to who should pay the expense of establishing a quarantine, and that which necessarily follows from its establishment, has frequently arisen under the provisions of our statute; and as law officer of the state, I have many times been called upon to determine by whom such expenses should be paid.

The recent act of the thirty-first general assembly has, however, wisely and I think permanently, settled all such vexatious questions.

Chapter 111 of the acts of the last general assembly provides that all expenses incurred in establishing, maintaining or raising a quarantine, including disinfection of the building, also expenses incurred by the local board of health in providing needful assistance, nurses, medical attendance and supplies, shall be paid by the county in which the expenses are incurred, and that the board of supervisors of that county shall, at the time it levies the general taxes, levy upon the property of the city, town or township from which such expenses were certified, a sufficient tax to reimburse the county to the extent of one-third the amount paid by it.

This appears to me to be a wise and just provision of the statute. The quarantine against a contagious or infectious disease is for the benefit of the general public, and while the locality in which such

disease is first discovered, should perhaps pay a penalty for the unsanitary condition which produced or invited such disease, the larger part of such expense should be borne by the political division of the state in which the expenses became necessary.

It was Franklin who wrote the maxim that "Public health is public wealth". This maxim is as true today as when uttered by Franklin, and it now finds a higher significance in the ascertained relationship of sound and vigorous health to the social and moral interests of individuals, families and nations.

Health is wealth and much more. It is the mental and physical progress of the human race. A sound and healthy mind cannot long exist without a sound and healthy body, and neither can exist in the highest type of perfection except under the influence of the best sanitary conditions.

The responsibility, therefore, of the progress of the people of the state, of their ability to accumulate wealth by labor, mental or physical, and of the acquisition of sound, healthy minds and bodies, characteristics which may be transmitted to their posterity, rests in a very large degree upon the boards of health, state and local.

In view of this responsibility, there should be hesitancy as to the full performance of the duties which the members of such boards have undertaken as public officers to perform. Every act done and every step taken should be with a realization of the truth of the maxim *Salus populi suprema est lex*.

TUBERCULOSIS IN THE SCHOOLS

HON. CHARLES W. MULLAN,

Attorney General.

DEAR SIR:

At the regular meeting of the State Board of Health held January 15 and 16, 1906, our circular No. 3, relating to contagious diseases in the public and private schools of Iowa was amended by inserting after rule 5 on page 3 the following:

Rule 6. Whenever any principal or superintendent of any school, or any county superintendent in any county, or any health officer in the state of Iowa shall have reason to believe that any superintendent, principal, teacher, pupil or employee in any school, public or private in this state, is affected with tuberculosis, he shall so inform the health officer, whose duty it shall be to procure or cause to be procured by the family physician, a sample of the sputum or other discharge of such supposed infected person and to forward the same to the Laboratory of the State Board of Health at Iowa City, for examination.

Should such examination in the Laboratory reveal the presence of this tubercular bacilli any such superintendent, principal, teacher, pupil or employee, shall be excluded from the school until such time as the Laboratory examination, made without expense, shall fail to reveal the presence of the tubercular bacilli.

I was requested by the Board to lay this rule before you and to ask you if such action is authorized by the statute and can be enforced as provided by section 2572 of the Code.

An early reply will very greatly oblige as the Board is anxious to have me announce it in the Bulletin at as early a date as possible.

I am, Very respectfully,
J. F. KENNEDY.

Des Moines, February 19, 1906.

DR. J. F. KENNEDY,
Secretary State Board of Health.

DEAR SIR:

I am in receipt of your favor of the 25th ultimo, asking me whether rule 6, adopted by the state board of health, can be enforced under the provisions of section 2572 of the code. In answer will say that, if tuberculosis is contagious, as I assume it is, I think it is within the power of the state board of health, under section 2565 of the code, to adopt the rule, and that the same can be enforced under the provisions of section 2572 as amended.

I am, Yours very truly,
CHAS. W. MULLAN.

LIABILITY OF COUNTY AND LOCAL BOARDS OF HEALTH FOR QUARANTINE ESTABLISHED UPON A MISTAKEN DIAGNOSIS

IN THE SUPREME COURT OF IOWA

FILED JULY 11, 1906

J. T. BECKS, *Appellant.*

vs.

DICKINSON COUNTY, IOWA, *et al.*

W. B. QUARTON, *Judge.*

The plaintiff and his family were quarantined thirty days by the local board of health of one of the townships in Dickinson County because of a supposed case of small pox in the family. There was in fact no contagious disease in the family and the plaintiff brings this suit to recover of the county and of the individual members of the local board of health of the township, damages which he alleges he has suffered on account of the quarantine. A demurrer to the petition and its amendment was sustained and a judgment rendered for the defendants. The plaintiff appeals.

J. W. COREY, *For Appellant.*
FRANCIS AND OWEN, *For Appellees.*

SHERWIN, *Judge*—

It is the settled law of this state, as well as the general rule, that municipal corporations are not liable for the negligence of their officers or agents in executing health regulations adopted for the purpose of preventing the spread of contagious diseases. In so far as a municipality undertakes the duty of making and enforcing quarantine regulations and other laws for the promotion of the public health, it is performing governmental functions, and its officers are not agents for whose action or inaction it is liable unless such liability is imposed by its charter, or by the laws of the state under which it exists:

McFadden vs. Town of Jewell, 119 Iowa 321;

Easterly vs. Town of Irwin, 99 Iowa, 694;

Ogg vs. The City of Lansing, 35 Iowa, 495;

Peckard vs. Volta, 94 Iowa, 277;

Calwell vs. The City of Boone, 51 Iowa, 687;

1 Tiedman State and Federal Control of Persons and Property, 122.

Furthermore, it is probably true that the officers in question were not strictly municipal officers or agents so as to render the county liable for their acts in any event. They became health officers by virtue of the statute which fixed the tenure of office also. While such officers are elected in townships, they are elected in obedience to the statute, to perform a public service not peculiarly local or corporate, * * but as state officers with such powers and duties as the statute confers upon them.

2 Dillon's Municipal Corporations, Sections 974, 975, 977.

When quarantined, the plaintiff and his family lived on a farm in one township and rented and worked a farm in another, and he alleges in his petition that because of his detention he was unable to care for the crops on the farm so rented, and unable to procure others to do so; that he suffered a total loss of the crop thereon for which he seeks recovery. In addition to his claim that the county is liable generally for the alleged negligence of the local board of health, the appellant contends that at the time of the quarantine the local officers promised that the county would provide him the necessary help for taking care of his crops and that because of such promise and further, because the statute makes the county liable in the first instance for the care of infected and quarantined persons, it is liable for the value of his crops. Section 2568 of the Code creates local boards of health and makes it the duty of such boards to make such regulations as are necessary for the protection of the public health, and to proclaim and establish quarantine against all infectious or contagious diseases dangerous to the public, and Section 2570 of the Supplement provides for the care of infected persons and for the payment of the expenses

incurred on account thereof. The statute neither expressly or by implication provides for anything more, and we are not at liberty to read into it an enlarged liability. It is also very clear that the members of the local board of health had no power to create a liability not imposed by law, even if they had acted under the direction of the board of supervisors. The liability that may be incurred by such boards is fixed by law and beyond this neither can go.

See Dillon *supra*.

The remaining question is whether the members of the local board of health are individually liable for the loss of the plaintiff's crops. The statute makes it the duty of health officers to quarantine against "all infectious or contagious diseases dangerous to the public" and it cannot well be questioned that the defendants were acting within the scope of their duty as such officers, and that in establishing the quarantine they were acting in a quasi judicial character. They were vested with the power to determine whether an infectious or contagious disease existed in the appellant's family, and if found to exist their duty under the statute required them to take the proper steps to prevent its spread, and had they neglected to do so they would have been culpable in a high degree. They were therefore acting judicially, and it is the general rule that officers so acting are not liable for injuries which may result from such acts performed in the honest exercise of their judgment, however erroneous or mistaken the action may be, provided there be no malice or wrong motive present.

Raymond vs. Fish, 51 Conn., 80;

Lowe vs. Conroy, 97 N. W. Rep. 942. (Wis.);

See also *Packard vs. Volts*, *supra*.

In some cases an exception to this general rule has been recognized and the individual officers have been held liable because of the maxim that where there is a wrong there is a remedy. See *Lowe vs. Conroy*, *supra*, and cases cited therein, and *McCord vs. High*, 24 Iowa, 335, where Judge Dillon in a concurring opinion recognizes and applies the rule. We are of opinion, however, that where the public health is involved, this rule should not be applied, notwithstanding the fact, that courts of great ability have so held. It is the modern tendency of judicial opinion to hold that the public health is the highest law of the land and "whenever a police regulation is reasonably demonstrated to be a promoter of public health all constitutionally guaranteed rights must give way to be sacrificed without compensation to the owner."

2 Tiedman on State and Federal Control, Sec. 169.

Nor does this doctrine necessarily conflict with the maxim to which we have referred. As we have already said, this board of health was a creation of the statute and its paramount duty was to protect the public health; its duty, then, was to the public and not to any individual member thereof, except to act honestly and without design to

injure him. If a health officer fails to do his duty no individual may complain, for the duty is public and the officer is not charged with any individual duty to any particular person.

Cooley on Torts, 382.

It there be no liability for an omission of public duty, it would seem to follow without question that an erroneous performance should not subject the officer to personal liability. It may, it is true, cause an injury to the individual, but it is not a wrong because the officers owe the individual no duty beyond what we have already stated.

Cooley on Torts, 379, 380.

In Volume 5 of his work on negligence, Judge Thompson says, "so a board of health may establish quarantine regulations and thereby cut off the entire trade of one section of the country with another. This measure may break up the business of a particular person and drive him into insolvency and yet he would have no action for damages against the members of the board although it might turn out that the regulation was in point of fact wholly unnecessary." It is "damnum absque injuria."

Burden vs. Nashua, 17 N. H. 477;

See also Sec. 6376.

This rule should not be so extended as to protect health officers who act without the scope of their authority or who act with gross negligence amounting to malice. In *Packard vs. Volts*, *supra*, the action was against the county and two of its supervisors individually for diverting and damming water to the damage of the plaintiff: It was alleged that the individual members of the board acted maliciously and in wanton disregard of the plaintiff's rights. We held that neither the county nor the individuals were liable notwithstanding the charge of malice against the latter; that they were acting under the direction of the board and that there could be no liability on their part as agents of the county because of the non-liability of their principal. The principle is applicable here, and we need not go to the length therein stated to find support for our conclusion. In *McCord vs. High*, heretofore referred to, the question of the public health was not involved, and we do not consider the opinion of Judge Dillon controlling in this case. It is unfortunate that any individual should suffer loss because of a mistake as to the existence of a dangerous contagious disease, and yet the welfare of the public is of such paramount importance that a rule should not be established which will have the necessary effect of increasing the public danger. If health officers, acting in perfect good faith and as their judgment dictates are held liable for a mistake in judgment, the effect upon the public health cannot be doubted. For instance, many competent physicians have never been brought into actual contact with small pox, and many mistakes have been made in diagnosing diseases which

later proved to be highly contagious. Whole communities have been exposed and suffered because of mistakes in judgment and over caution for the liberty of the individual. If civil liability is to be imposed because of a quarantine which is later proved unnecessary, the danger to the public will be greatly enhanced, and the effectiveness of the statute greatly impaired. We do not feel like announcing such a rule, nor do we believe justice to the individual requires it. The judgment is therefore affirmed.

Laws Relating to the Public Health and Safety

Compiled from the Code, and from the Acts of Subsequent
General Assemblies

XVIII

STATE BOARD OF HEALTH

CHAPTER 16, TITLE XII, CODE SUPPLEMENT.

SECTION 2564. The state board of health shall consist of the attorney-general and the state veterinary surgeon, who shall be members by virtue of their offices, one civil engineer and seven physicians, to be appointed by the governor, each to serve for a term of seven years and until his successor is appointed; vacancies to be filled by the governor for the unexpired term. But no one of the seven physicians hereafter appointed shall be an officer or member of the faculty of any medical school, and the governor shall have the power to remove any member of said board for good cause shown. It shall meet semi-annually in January and July, and at such other times as it may decide upon, such meetings to be held at the seat of government; suitable rooms (office supplies and furniture, except postage and stationery*) therefor to be provided by the custodian of the capitol. At the meeting held in July, a president from their number, and a secretary who shall be a physician not of their number, shall be elected, and the latter have an office in the capitol. For the purposes contemplated in this section the state shall be divided into health districts, numbered and consisting of the counties named as follows:

DISTRICT No. 1.—Allamakee, Butler, Bremer, Black Hawk, Buchanan, Chickasaw, Clayton, Delaware, Fayette, Floyd, Grundy, Howard, Mitchell, Winnebago.

DISTRICT No. 2.—Benton, Cedar, Clinton, Dubuque, Iowa, Jones, Jackson, Johnson, Linn, Muscatine and Scott.

DISTRICT No. 3.—Appanoose, Davis, Des Moines, Henry, Jefferson, Keokuk, Louisa, Lee, Mahaska, Monroe, Wapello, Washington, Van Buren.

DISTRICT No. 4.—Cerro Gordo, Calhoun, Emmet, Franklin, Hancock, Humboldt, Hamilton, Hardin, Kossuth, Palo Alto, Pocahontas, Webster, Winnebago, Worth, Wright.

DISTRICT No. 5.—Buena Vista, Cherokee, Clay, Dickinson, Ida, Lyon, Osceola, O'Brien, Plymouth, Sioux, Sac, Woodbury.

DISTRICT No. 6.—Audubon, Adair, Cass, Crawford, Carroll, Greene, Guthrie, Harrison, Monona, Pettawattamie and Shelby.

DISTRICT No. 7.—Boone, Dallas, Jasper, Marshall, Madison, Marion, Polk, Story, Tama, Poweshiek and Warren.

DISTRICT No. 8.—Adams, Clarke, Decatur, Fremont, Lucas, Mills, Montgomery, Page, Ringgold, Taylor, Union and Wayne.

When vacancies occur in the State Board of Health, it shall be the duty of the governor to appoint to membership on the board physicians residing in the various health districts until seven such districts are represented on the board. After which time the annual appointment shall be made from the physicians residing in the district not represented on the board the preceding year.

Sec. 2565. The board shall have charge of and general supervision over the interests of health and life of the citizens of the state; matters pertaining to quarantine, registration of marriages, births and deaths; authority to make such rules and regulations and sanitary investigations as it from time to time may find necessary for the preservation and improvement of the public health which when made shall be enforced by local boards of health and peace officers of the state. It shall prepare and furnish, through its secretary, to the clerks of the several counties such forms for the record of marriages as it may determine upon, and by its secretary make biennial reports to the governor, which shall include so much of its proceedings, such information concerning vital statistics, such knowledge respecting diseases, and such instructions upon the subject of hygiene, as may be thought useful for dissemination among the people, with such suggestions as to further legislation as may be thought advisable.

*Sec. 2568. The mayor and council of each town or city, or the trustees of any township, shall constitute a local board of health within the limits of such towns, cities or townships of which they are officers. The town, city, or township clerk shall be clerk of the local board, which board shall appoint a competent physician as its health officer, who shall hold office during its pleasure. It shall regulate all fees and charges of persons employed by it in the execution of health laws and its own regulations and those of the state board of health; have charge of all cemeteries dedicated to public use not controlled by other trustees or incorporated bodies, and the burial of the dead; make such regulations as are necessary for the protection of the public health respecting nuisances, sources of filth, causes of sickness, rabid animals and quarantine, not in conflict with any regulations of the State Board of Health, which shall also apply to boats or vessels in harbors or ports within their jurisdiction; to proclaim and establish quarantine against all infectious or contagious diseases dangerous to the public, and maintain and remove the same, as may be required by regulations of the State Board; may, when satisfied upon due examination that any cellar, room, tenement building, or place occupied as a dwelling or otherwise has become, or is by reason of the number of occupants, uncleanness or other cause, unfit for such purpose, or a cause of nuisance or sickness to the occupants or the public, issue a notice in writing to such occupants, or any of them, requiring the premises to be put in proper condition as to cleanliness, or requiring the occupants to remove or quit such premises within a reasonable time to be fixed; and, if the persons so notified or either of them, neglect or refuse to comply therewith, may by order cause the premises to be properly cleaned at the expense of the owner or owners, or may forcibly remove the

*Sections 2566 and 2567 were repealed by the 31st General Assembly.

occupants and close the premises, and peace and police officers shall execute such orders, which premises so closed shall not be again occupied as a dwelling place without written permission of the board. The quarantine authorized by this section in case of infectious or contagious diseases may be declared or terminated by the mayor of any city or town, or the township clerk outside of such city or town, in cases required by regulations of the State Board of Health, upon written notice given by any practicing physician of the existence of such disease, or termination of the cause for quarantine, as the case may be.

Sec. 2569. The local board may with its physician when of the opinion it is necessary for the prevention of the lives or health of the inhabitants, enter a building, vessel or place for the purpose of examining into, preventing, removing or destroying any nuisance, source of filth or cause of sickness, and in case its members or physician shall be refused such entry, make complaint through any member under oath to any magistrate of the county, whether a member of the board or not, stating the facts so far as known, and the magistrate shall thereupon issue his warrant, directed to any peace officer of the county, commanding him between the hours of sunrise and sunset, accompanied by two or more members of the board, to prevent, remove or destroy such nuisance, source of filth or cause of sickness, which shall be executed by the officer under the direction of such members of the board, and it may order the owner of any property, building or place to remove at his own expense within twenty-four hours, or such other time as may be fixed by it, after notice has been served upon such owner, occupant or other person in charge thereof, any nuisance, source of filth or cause of sickness found thereon, and if such person fails or neglects to comply with the order and make such removal, it may cause the same to be done at the expense of the owner or occupant.

*Sec. 2570. When any person shall be sick or infected with smallpox or other infectious or contagious disease dangerous to the public health, whether a resident or otherwise, the local board of health shall make such provisions as are best calculated to protect the inhabitants therefrom, and may remove such person to a separate house, or to a pest house or detention or other hospital, and shall provide needful assistance, nurses, medical attendance and supplies. If in the judgment of said board such person can not be removed, then he shall be cared for at the place where he resides in the same manner as above provided. In case of the removal of more than one person to the same house, or to any pest house, or detention or other hospital, said board shall provide needful assistance, nurses, medical supplies and attendance necessary for their proper care. All bills for expenses incurred in carrying out provisions of this section, and in establishing, maintaining, or raising a quarantine, including disinfection and the building and furnishing of any pest house, detention or other hospital, shall be filed with the clerk of the local board of health, which board shall examine the same and act thereon at its next regular meeting after the same have been filed with the clerk and shall certify the amount allowed by it thereon to the county

*As enacted by the 31st General Assembly. Section 2566 and 2567 were repealed by the 31st General Assembly.

auditor, and the board of county supervisors shall act upon said bills as thus certified at its first regular meeting thereafter. The local board of health shall allow an amount on such bills as shall be reasonable, and the certificate of the local board of health shall be prima facie evidence of the correctness of said bills, but the board of supervisors may revise the amounts so allowed and fix the same.

The expenses paid under the provisions of this section shall in no case exceed the reasonable value of the property furnished or services rendered and the county shall not advance such expenses until the same shall have been audited and allowed by the board of supervisors; and the said board of supervisors, shall, at the time it levies the general taxes, levy on the property of the city, town or township, from which such expenses were certified, a sufficient tax to reimburse the county to the extent of one-third of the amount paid by it under the provisions of this act.

It is further provided that nothing herein contained shall be construed to prevent any person quarantined, as herein provided, from employing at his own expense, the physician or nurse of his choice. The forcible removal of sick or infected persons, as herein provided, shall be effected by an application made to any civil magistrate, in the manner provided for the removal and abatement of nuisances, who shall issue the warrant as directed in such cases, to remove such person or persons to the place designated by the local board of health, or to take possession of the condemned or infected houses or lodgings, and such officer shall receive a reasonable compensation for such services to be determined and allowed by said board.

Sec. 2571. Local boards of health shall meet for the transaction of business on the first Mondays of April and October in each year, and at such other times as may seem necessary. They shall give notice of all regulations adopted, by publication thereof in some newspaper printed and circulated in the town, city or township, or, if there is none, by posting a copy thereof in five public places therein, and through their physician or clerk shall make general report to the state board at least once a year, and special reports when it may demand them, of its proceedings and such other facts as may be required, on blanks furnished by and in accordance with instructions from it. All expenses incurred in the enforcement of the provisions of this chapter, when not otherwise provided, shall be paid by the town, city or township; in either case all claims to be presented and audited as other demands. In the case of townships, the trustees shall certify the amount required to pay such expenses to the board of supervisors of the county, and it shall advance the same, and, at the time it levies the general taxes, shall levy on the property of such township a sufficient tax to reimburse the county, which, when collected, shall be paid to and belong to the county.

Sec. 2572.—Local boards of health shall obey and enforce the rules and regulations of the State Board; and peace and police officers within their respective jurisdictions, when called upon to do so by the local boards, shall execute the orders of such board. If any local board of health shall refuse or neglect to enforce the rules and regulations of

the State Board of Health, the State Board of Health may enforce its rules and regulations within the territorial jurisdiction of such local board, and for that purpose shall have and may exercise all the powers given by statute to local boards of health; and the peace and police officers of the state, when called upon by the State Board of Health to enforce its rules and regulations, shall execute the orders of such board. All expenses incurred by the State Board of Health in determining whether its rules and regulations are enforced by a local board of health, and in enforcing the same when a local board has refused or neglected to do so, shall be paid in the same manner as is now provided for the payment of the expenses of enforcing such rules and regulations by local boards of health.

Sec. 2573. Any person being notified to remove any nuisance, source of filth, or cause of sickness, as in this chapter provided, who fails, neglects or refuses to do so after the time fixed in such notice, or knowingly fails, neglects or refuses to comply with and obey any order, rule or regulation of the state or local board of health, or any provision of this chapter, after notice thereof has been given as herein provided, shall forfeit and pay the sum of twenty dollars for each day he refuses such obedience, or for each day he knowingly fails, neglects or refuses to obey such rule or regulation, or knowingly violates any provision of this chapter, to be recovered in an action in the name of the clerk of the board, and, when collected, to be paid to the clerk of the town, city or township, as the case may be, and for its benefit; and in addition thereto, any one so offending, or knowingly exposing another to infection from any contagious disease, or knowingly subjecting another to the danger of contracting such disease from a child or other irresponsible person, shall be liable for all damages resulting therefrom, and guilty of a misdemeanor.

Sec. 2574. The Secretary of the State Board of Health shall receive such salary as the Board shall fix, not to exceed twelve hundred dollars yearly, payable upon the certificate of the president to the state auditor, who shall issue his warrant for the amount due upon the state treasurer. Each member of the Board shall receive only actual traveling and other necessary expenses incurred in the performance of his duties, such expenses to be itemized, verified, certified audited and a warrant drawn therefor in the same manner as the Secretary's salary.

*Sec. 2575-a. That when a controversy arises between municipalities or between boards of health thereof, respecting the location of pest houses or hospitals for the treatment of infectious or contagious diseases, such matter shall be referred to the president of the State Board of Health, who shall forthwith appoint a committee of three (3) members thereof, which committee shall upon two days' notice to the parties interested, investigate the matter and make such order in the premises as the facts warrant, and such order shall be final.

*Sec. 2575-b. The health officers of the municipality which is allowed to maintain a pest house or hospital for patients affected by infectious

*As amended by the 28th General Assembly.

or contagious diseases outside the limits of said municipality, shall have exclusive jurisdiction and control of such pest house or hospital for the enforcement of all sanitary and health regulations.

Sec. 2576. The sum of five thousand dollars, or so much thereof as may be necessary, is annually appropriated to pay the salary of the Secretary, expenses of the board, contingent expenses of the Secretary's office, and all costs of printing; all such contingent and miscellaneous expenses to be itemized, verified, certified, audited and paid as other expenses of the board.

REMOVAL OF PERSONS SICK WITH INFECTIOUS DISEASES

CHAPTER 99—ACT. 30TH GENERAL ASSEMBLY

Section 1. That no person known to be infected, or sick with any contagious disease dangerous to the public health shall move or be removed from one city, town or township to another city, town or township, except as hereinafter provided and by written permission of the local board of health of the city, town or township to which such person is to be removed.

Sec. 2. If any person known to be infected or sick with smallpox or other contagious disease dangerous to the public health shall with the knowledge or consent of any member of the local board of health of the city, town or township in which he resides, be removed from said city, town or township to another city, town or township, either with or without the permission of the local board of such city, town or township to which he is removed, all expense of quarantine or care of such person incurred by the city, town or township to which he is removed shall be paid by the city, town or township from which such person was so removed, in the manner provided in section two thousand five hundred and seventy-a (2570-a) of the Supplement to the Code. If said person be so removed to another county, said expenses shall in the first instance be paid by such county and recovered from the county from which said person has been removed.

Sec. 3. When it is determined by any physician or health officer that any person is sick with smallpox or any other contagious disease dangerous to the public health while in any city, town or township other than the one in which he resides, provided the distance be not to exceed fifteen (15) miles from his place of residence, then and in that event if the person so diseased elect to be moved to the city, town or township in which he resides, he may be so removed by private conveyance along the least frequented highways under escort of a health officer to his abode immediately on determining that he is so diseased; and every such vehicle shall carry as a signal of warning, conspicuously displayed, a yellow flag not less than two feet square. All expenses of removal, care and quarantine of such person shall be paid by the city, town or township to which he is removed and shall be paid in the manner provided in section 2 of this chapter.

Sec. 4. Any person who shall move, or any physician or any member of the local board of health who shall cause or assist any person known to be infected or sick with smallpox or any contagious disease dangerous to the public health to be removed from one city, town or township to another city, town or township, contrary to the provisions of this act or of any regulation of the State Board of Health, shall be guilty of a misdemeanor, and be punished by a fine not exceeding one hundred dollars (\$100) or imprisonment not exceeding thirty (30) days, or both, at the discretion of the court.

Approved April 13th, A. D. 1904.

CHAPTER 120—31st GENERAL ASSEMBLY

STATE SANITARIUM FOR THE TREATMENT OF TUBERCULOSIS

Be It Enacted by the General Assembly of the State of Iowa:

Section 1. There is hereby established a state sanitarium for the care and treatment of persons afflicted with incipient pulmonary tuberculosis which shall be called the State Sanitarium for the treatment of tuberculosis.

Sec. 2. The officers and employees of said sanitarium shall consist of a Superintendent and such other officers and employees to be appointed as the board of control of state institutions shall deem necessary for the proper operation of said institution, including examining physicians.

Said Superintendent shall be a well educated physician with an experience of at least five years in actual practice of medicine.

Said Superintendent shall be appointed by the board of control of state institutions for the term of four years and shall receive such salary as the said board may fix, not exceeding two thousand five hundred dollars (\$2,500.00) per annum.

Sec. 3. The board of control of state institutions shall have the same power and control over said institutions as is now given it with reference to the several institutions mentioned in chapter one hundred eighteen (118) of the acts of the Twenty-seventh General Assembly and all amendments thereto, and said acts and amendments shall apply to and govern said Sanitarium in every respect in so far as they are not in conflict with the provisions of this act.

Sec. 4. There is hereby appropriated fifty thousand dollars (\$50,000.00) for the purpose of carrying out the provisions of this act to be expended by the board of control, as herein provided for.

Sec. 5. As soon as practicable after the passage and publication of this act, and when the funds are available therefor, said board of control shall proceed to purchase the necessary land for said Sanitarium, and erect, furnish and equip the needed buildings.

In locating said Sanitarium, it shall take into consideration climate, healthfulness, water supply, drainage, quality of soil, facility of access,

timber protection to buildings and a suitable building site. (Said site shall contain not less than 160 acres or whatever may be deemed necessary by the board of control.)

The buildings shall be planned to accommodate at least one hundred patients and necessary officers and employees.

Sec. 6. When said Sanitarium buildings are erected, furnished, equipped and ready for use, said board of control shall notify the Governor of the fact, who shall thereupon issue his proclamation of the opening of said Sanitarium.

Sec. 7. In addition to the duties which may now be imposed by law, the superintendent shall oversee and secure the individual treatment and professional care of each and every patient residing in the sanitarium.

He shall prescribe rules subject to the approval of the board of control and not inconsistent with the statutes for the application, examination, reception and government of patients and their discharge, and shall keep a full record of their condition and prospects.

He shall endeavor to stimulate the organization and assist in the establishment of hospital, dispensaries, in various counties or large centres of population, for the treatment of patients with advanced tuberculosis.

He shall reside at the institution.

Sec. 8. No patients shall be received except those afflicted with pulmonary tuberculosis in the incipient stage, and who show a reasonable probability of satisfactory improvement by treatment in the sanitarium.

Any person wishing to become a patient in the institution shall first make application and if it shall appear to the superintendent from the answers to the questions therein that the applicant has been and is a bona fide resident of this State and is in all other respects entitled under the law to admission, said application shall be sent by the Superintendent to the examining physician living nearest to the residence of the applicant, and said applicant directed to report to said examining physician for an examination.

Said examining physician shall examine said applicant fully with a view of ascertaining whether he is afflicted with incipient tuberculosis, and shall so far as possible fill out the blanks which may be furnished him for that purpose and shall mail the same to the Superintendent of the Sanitarium, who shall examine the same and if he finds that the applicant as shown by the answers, or by the examination of the examining physician, has been and is a bona fide resident of this State and is in all other respects under the law entitled to admission, he shall receive the applicant as a patient providing there is room, and if no room be then available, he shall enter the name on a book in the order in which the application is made, and the applicant shall be admitted in said order whenever there is room.

In case it shall appear from the application itself, or from the report of the examining physician, that the applicant does not come within the

provisions of the law, or in case the superintendent shall be in possession of reliable information which convinces him that the applicant is not entitled to the benefits of this act, he shall forthwith notify the applicant that he can not be admitted as a patient.

If, however, the superintendent after receiving the report of the examining physician, is in doubt as to whether it is a case of incipient pulmonary tuberculosis, he shall personally examine the applicant in case he presents himself at the institution for that purpose.

Sec. 9. The board of control of state institutions shall, on the recommendation of the superintendent, and on the approval of the said board appoint physicians in such localities in the State as they may deem proper, whose duty it shall be to examine all persons who apply to them, and who have previously made application to the superintendent to be admitted as patients in the sanitarium, provided, however that the applicant shall in each case pay said examining physician the sum of three (\$3.00) which shall be in full for such examination.

He shall carefully fill out the blanks in the examination paper and shall also give any additional information he may possess which may aid in determining the eligibility of the person so examined for admission as a patient in the institutions.

Said examining physicians shall be graduates of a medical college school in good standing under the laws of Iowa, and shall be selected, so far as practicable, because of his experience with the knowledge of pulmonary diseases.

Sec. 10. In case an applicant who has been authorized to be received as a patient in the sanitarium, is without means to pay for transportation and other necessary expenses to and from, including treatment at the institution, and such fact is duly certified to by the board of health of the city, or incorporated town, where the applicant resides, or by the majority of the township trustees in case the applicant resides outside of a city or incorporated town, and the superintendent is satisfied that such is the fact, then such expense shall be paid by the State out of any funds in the State treasury not otherwise appropriated after the same is certified by said superintendent and approved by the board of control.

Sec. 11. The board of control of state institutions shall fix the per capita monthly allowance which may be charged by the said institution for the care, treatment and maintenance of each patient therein which shall not exceed the sum of twenty dollars (\$20.00) per capita per month, which shall be certified by the superintendent to said board of control and paid out as provided in chapter one hundred eighteen (118) of the acts of the Twenty-seventh General Assembly.

Provided that the average number of patients in said sanitarium shall not exceed two hundred per month, it shall be credited by the auditor of state and the treasurer of state with the sum of four thousand dollars (\$4,000.00) per month which may be drawn as above provided.

Sec. 12. Said sanitarium shall be open for all patients, but all patients who are able to pay, shall be charged such rate monthly as the board

of control may fix, not exceeding the average actual per capita cost of care, treatment and maintenance. All sums so collected shall by the board of control, be covered into the State treasury.

Sec. 13. For the purpose of the maintenance of said sanitarium during the first month of its operation, the Superintendent thereof may estimate, in advance of said opening and on the basis of a population of two hundred patients at twenty dollars (20.00) per capita per month for the supplies to operate the sanitarium, to furnish and equip the same, and to purchase tools, animals, implements and other articles so far as then necessary, and to collect and disseminate information regarding tuberculosis, for the first month and the aggregate of said per capita shall be credited to said institution by the auditor of State and the treasurer of State and may be drawn against as provided in chapter one hundred eighteen (118) of the acts of the Twenty-seventh General Assembly.

REGISTRATION OF PHYSICIANS REGISTERED IN OTHER STATES

CHAPTER 102, 39TH GENERAL ASSEMBLY.

Be it enacted by the General Assembly of the State of Iowa:

Section 1. That the law as it appears in section two thousand five hundred eighty-two (2582) of the code supplement be, and the same is hereby amended by adding thereto the following:

"(a) A certificate of registration showing that an examination has been made by the proper board of any state, on which an average grade of not less than seventy-five (75) per cent was awarded, the holder thereof having been at the time of said examination the legal possessor of a diploma from a medical college in good standing in this state, may be accepted in lieu of an examination, as evidence of qualification. But in case the score of said examination was less than that prescribed by this state, the applicant may be required to submit to a supplemental examination in such subjects as have not been covered.

"(b) A certificate of registration or license, issued by the proper board of any state, may be accepted as evidence of qualification for registration in this state, provided the holder thereof was, at the time of such registration, the legal possessor of a diploma issued by a medical college in good standing in this state, and that the date thereof was prior to the legal requirement of the examination test in this state. The fee for such examination shall be fifty dollars."

Sec. 2. If, by the laws of any state or the rulings or decisions of the appropriate officers or boards thereof, any burden, obligation, requirement, disqualification or disability is put upon physicians registered in this state or holding diplomas from medical colleges in this state, which are in good standing therein, affecting the right of said physicians to be registered or admitted to practice in said state, then the same or like burdens, obligations, requirements, disqualification, or disability shall be put upon the registration in this state of physicians registered in said state, or holding diplomas from medical colleges situated therein.

Sec. 3. This act, being deemed of immediate importance, shall take effect and be in force from and after its publication in the Register and Leader and the Des Moines Daily Capital, newspapers published in Des Moines, Iowa.

Approved March 15, A. D. 1904.

MARRIAGES, DIVORCES, REGISTRATION OF BIRTHS AND DEATHS.

CHAPTER 109—31ST GENERAL ASSEMBLY.

II. F. 86

Be It Enacted by the General Assembly of the State of Iowa:

Section 1. That for the complete and proper registration of births and deaths for legal, sanitary and statistical purposes, the Secretary of the State Board of Health is hereby constituted State Registrar of Vital Statistics, and it shall be his duty to promulgate and enforce all necessary rules and regulations that may be required to carry out the purpose of this act.

Sec. 2. The undertaker or the person in charge of the funeral of any person dying in Iowa, shall cause a certificate of death to be filled out, with all personal particulars contained in the standard blanks adopted by the U. S. Census Bureau, and with a statement of cause of death by attending physician, or in his absence, by the health officer or coroner, and shall file it with the State Registrar on or before the 5th day of each month for the month preceding and no sexton or superintendent of a cemetery shall permit interment, and no railroad or other transportation company shall permit shipment of the body unaccompanied by such certificate of death.

Sec. 3. The State Registrar shall furnish blank certificates of death to physicians and undertakers, and all proper forms and instructions for the effectual execution of the law.

Sec. 4. It shall be the duty of the State Registrar to furnish to the Clerk of the District Court of each county on or before the first day of February of each year, certified transcripts of the certificates of death filed with him from the respective counties as well as similar transcripts of deaths to the U. S. Bureau at Washington, and to arrange by counties, bind and deposit in the State Historical Building at Des Moines the original certificates; and transcripts sent each county shall be bound at the expense of said county, and preserved for reference by the Clerk of the District Court.

Sec. 5. It shall be the duty of all assessors at the time of making assessment to obtain and report to the Clerk of the District Court upon blanks adopted by the State Registrar and furnished by the county auditor, such registration of births as occur within their respective districts for the year ending December 31st immediately preceding.

Sec. 6. The Clerk of the Court in each county shall keep a book in which shall be recorded all marriages and divorces occurring within the county, together with such data respecting the same as shall be required by the State Registrar, and shall report to said State Registrar on or before the first day of August in each year, such data respecting such marriages and divorces for the year ending June 30th immediately preceding, and the Clerk of the District Court of each county shall keep a book in which shall be recorded all births occurring within the county as shown by the returns filed in this (his) office by the assessor as provided the section preceding, and on or before the first day of August in each year shall furnish to the State Registrar a report of such births.

Sec. 7. There is hereby appropriated the sum of two thousand five hundred dollars (\$2,500.00) or so much thereof as may be necessary to pay the expenses of printing, postage, clerk hire, and such other expenses as may be required, including a sum not to exceed twenty-five dollars (\$25.00) a month to the State Registrar in addition to his salary as otherwise authorized. All bills to be itemized, certified to, and approved by the State Registrar.

Sec. 8. Any person acting as undertaker, sexton, agent of a transportation company, or either person, violating any of the provisions of this act shall be fined not less than ten dollars (\$10.00) and not more than one hundred dollars (\$100.00) or be imprisoned not more than sixty (60) days or be subject to both fine and imprisonment at the discretion of the court. It shall be the duty of the prosecuting attorney in each county upon complaint of the State Registrar to prosecute in such cases and the State Registrar shall endeavor to see that this act is uniformly and officially executed throughout this State.

Sec. 9. Sections twenty-five hundred sixty-six (2566) and twenty-five hundred sixty-seven (2567) of the Code, and chapter one hundred (100) of the laws of the Thirtieth (30) General Assembly and all other acts and parts of acts in conflict with this act are hereby repealed.

BACTERIOLOGICAL LABORATORY

CHAPTER 101, THIRTIETH GENERAL ASSEMBLY AS AMENDED BY THE THIRTY-FIRST GENERAL ASSEMBLY.

H. F. 455

Be it enacted by the General Assembly of the State of Iowa:

Section 1. Establishment. The bacteriological laboratory of the medical department of the state university at Iowa City, is hereby established as a permanent part of the medical department of the university work, and it shall in addition to its regular work perform all scientific analyses and tests, chemical, microscopical or other scientific investigation, which may be required by the state board of health, and it shall make prompt report of the results thereof, under such rules and regulations as the said state board of health may from time to time adopt.

Sec. 2. *Director—reports.* The professor of bacteriology of the medical department of the state university shall be the director of said laboratory and shall make or cause to be made all such analyses, tests and investigations as shall be required by the state board of health as provided in the preceding section, causing the same to be made without delay and giving such analyses, tests or investigations the preference of the point of time over all other work and shall make prompt report of the result thereof to the board of health or to such person or persons as the board of health may by rule or designation designate.

Sec. 3. *Appropriations—purposes.* There is hereby appropriated for the purpose of more perfectly equipping the present bacteriological laboratory at the state university and for the purpose of enabling it to

perform the duties hereby imposed, and to provide it with the necessary apparatus and assistants to render the same effective, the sum of one thousand dollars (\$1000) for apparatus and the further sum of three thousand five hundred dollars (\$3500) or so much thereof as may be necessary annually to be the additional salary of said director, the assistants, the expenses of said laboratory as may be necessary by this act, including postage, stationery and other contingent and miscellaneous expenses which may be incurred in the maintaining of said laboratory and perform the duties required therein by the provision of this act. The director shall receive such additional salary not exceeding twelve hundred dollars (\$1200) per year as the state board of health may fix. The appropriations hereby provided shall be expended in the manner provided in section two thousand five hundred and seventy-five (2575) of the code.

Sec. 4. *In effect.* This act, being deemed of immediate importance, shall take effect and be in force from and after the date of its publication in the Register and Leader and the Des Moines Daily Capital, newspapers published in the city of Des Moines, Iowa.

Approved April 12, A. D., 1904.

OF THE PRACTICE OF MEDICINE

CHAPTER 17, TITLE XII (CODE AND SUPPLEMENT AS AMENDED BY 31ST G. A.)

Section 2576, *Board of medical examiners—examinations—certificates.* The state board of medical examiners shall consist of the physicians of the state board of health, and the secretary of the board of health shall be secretary thereof. It shall hold regular meetings in January and July and special ones as may be necessary, due notice thereof being given, at which it shall discharge the duties contemplated by this chapter. All examinations shall be in writing, each candidate for examination in any school of medicine being given the same set of questions, covering anatomy, physiology, general chemistry, pathology, surgery and obstetrics. In materia medica, therapeutics and the principles and practice of medicine, a set of questions shall be used corresponding to the school of medicine which the applicant desires to practice. The examination papers, when concluded, shall be marked upon the scale of one hundred, each candidate for examination first to pay to the secretary of the board a fee of *ten dollars therefor. The average required to pass shall be fixed by the board prior to the examination. Each applicant shall, upon obtaining an order for examination, receive from the secretary a confidential number which he shall place upon his work when completed, so that the board, in passing thereon, shall not know by whom it was prepared. All matters connected therewith shall be filed with the secretary and preserved for five years as a part of the records of the Board,

*As amended by the Twenty-eighth General Assembly, chapter 89.

†As amended by the Thirty-first General Assembly, chapter 114.

during which time they shall be open to public inspection. If the examination is satisfactory to five members of the board, it shall issue its certificate, under its seal, signed by its president, secretary, and not less than three other members, who may, in the absence of the others, act as an examining board, and the different schools of medicine represented in the board of health shall be represented in said number. The certificate, while in force, confers upon the holder the right to practice medicine, surgery and obstetrics, and be conclusive evidence thereof. *(Graduates from legally authorized medical schools, which in the opinion of the board are of good standing, holding genuine diplomas therefrom, upon presentation of the same, accompanied by a fee of five dollars, and such proof as may be required touching the genuineness and ownership of the diploma and the character and standing of the school issuing it, shall be by the board granted certificates, signed as above provided, conferring the right to practice as under certificates issued upon examination). In all examinations made or proceedings had pursuant to the provisions of this chapter, any member of the board may administer oaths and take testimony in any manner authorized by law. Any one failing in his examination shall be entitled to a second one, within three months thereafter, without further fee. If any person shall by notice in writing apply to the secretary of the board for an examination or re-examination, and it falls or neglects for three months thereafter to give him the same, he may, notwithstanding any provision of this chapter, practice medicine until the next regular meeting of the board without the required certificate.

Sec. 2577. *Recording certificates.* Every certificate issued under this chapter shall show whether it was granted upon examination or diploma, and the school of medicine the holder practices under. He shall, before engaging in the practice of medicine, file the same for record in the office of the recorder of the county in which he resides, who shall record it in a book provided for that purpose, which record shall be open to public inspection, and for which service the recorder may charge a fee of fifty cents, to be paid by the certificate-holder. The same record must be made of the certificate in any county to which the holder may remove and in which he proposes to practice.

Sec. 2578. *Refusal of certificate—revocation.* The board of medical examiners may refuse to grant a certificate to any person otherwise qualified, who is not of good, moral character, and for like cause, or for incompetency, or habitual intoxication, or upon satisfactory evidence by affidavit or otherwise that a certificate had been granted upon false and fraudulent statements as to graduation or length of practice, may revoke a certificate by affirmative vote of at least five members of the board, which number shall include one or more members of the different schools of medicine represented in said board; nor shall the standing of a legally chartered medical college, from which a diploma may be presented, be questioned, save by a like vote. After the revocation of a certificate, the holder thereof shall not practice medicine, surgery or obstetrics in the State.

*Repealed by the Twenty-eight General Assembly, chapter 89.

Sec. 2579. *Who deemed practitioner.* Any person shall be held as practicing medicine, surgery or obstetrics, or to be a physician, within the meaning of this chapter, who shall publicly profess to be a physician, surgeon or obstetrician, and assume the duties, or who shall make a practice of prescribing or of prescribing and furnishing medicine for the sick, or who shall publicly profess to cure or heal; but it shall not be construed to prohibit students of medicine, surgery or obstetrics, who have not had less than two courses of lectures in a medical school of good standing, from prescribing under the supervision of preceptors, or gratuitous service in case of emergency, nor to prevent the advertising, selling or prescribing natural mineral waters flowing from wells or springs, nor shall it apply to surgeons of the United States army or navy, nor of the marine hospital service, nor to physicians or midwives who have obtained from the board of examiners a certificate permitting them to practice medicine, surgery or obstetrics without a diploma from a medical school or examination by the board, nor to physician, as defined herein, who have been in practice in this state for five consecutive years, three years of which time shall have been in one locality, nor to filling prescriptions by a registered pharmacist, nor to the advertising and sale of patent or proprietary medicines.

Sec. 2580. *Penalties.* Any person who shall present to the board of medical examiners a fraudulent or false diploma, or one of which he is not the rightful owner, for the purpose of procuring a certificate as herein provided, or shall file, or attempt to file, with the recorder of any county in the state the certificate of another as his own, or who shall falsely personate any one to whom a certificate has been granted by such board, or shall practice medicine, surgery or obstetrics in the state without having first obtained and filed for record the certificate herein required, and who is not embraced in any of the exceptions contained in this chapter, or who continues to practice medicine, surgery or obstetrics after the revocation of his certificate, is guilty of a misdemeanor, and, upon conviction thereof, shall be fined not less than three hundred dollars, nor more than five hundred dollars and costs of prosecution, and shall stand committed to the county jail until such fine is paid; and whoever shall file or attempt to file with the recorder of any county in the state the certificate of another with the name of the party to whom it was granted or issued erased, and the claimant's name inserted, or shall file or attempt to file with the board of medical examiners any false or forged affidavit of identification, shall be guilty of forgery.

Sec. 2581. *Itinerant Physician.* Every physician practicing medicine, surgery or obstetrics, or professing or attempting to treat, cure or heal diseases, ailments or injuries by any medicine, appliance or method, who by himself, agent or employer goes from place to place, or from house to house, or by circulars, letters of advertisements solicits persons to meet him for professional treatment at places other than his office at the place of his residence, shall be considered an itinerant physician; and any such itinerant physician shall, in addition to the certificate elsewhere provided for in this chapter, procured from the State board of medical examiners a license as an itinerant, for which he shall pay to the treasurer of state, for use of state of Iowa, the sum of two hundred and fifty dollars per

annum. Upon payment of this sum, the Secretary shall issue to the applicant therefor a license, to practice within the State, as an itinerant physician, for one year from the date thereof. The Board may, for satisfactory reasons, refuse to issue such license, or may cancel such license upon satisfactory evidence of incompetency or gross immorality. Any person practicing medicine as an itinerant physician, as herein defined, without having procured such license shall be guilty of a misdemeanor, and, upon conviction thereof, shall be fined not less than three hundred dollars nor more than five hundred dollars and costs, and shall be committed to the county jail until such fine is paid; *provided*, however, that nothing herein shall be construed to prevent any physician otherwise legally qualified from attending patients in any part of the State to whom he may be called in the regular course of business, or in consultation with other physicians.

SEC. 2582. *Examination and diploma required.* From and after January 1, 1899, all persons beginning the practice of medicine in the state of Iowa, must submit to an examination as set forth in this chapter, and, in addition thereto, shall present diplomas from medical colleges recognized as in good standing by the state board of medical examiners, and all persons receiving their diplomas subsequent to January 1, 1899, shall present evidence of having attended four full courses of study of not less than twenty-six weeks each, no two of which shall have been given in any one year.

(The state board of medical examiners shall examine the graduates of the medical departments of the state university of Iowa and of such other medical colleges in this State as are recognized by said board of medical examiners as being in good and legal standing at the annual medical commencement and at the location of said state university and other medical colleges respectively.)*

SEC. 2583. *Fees—Compensation.* Each member of the board of examiners shall receive, out of the fund created by the payment of fees by applicants for examination or certificates, the sum of eight dollars for each day, and necessary traveling expenses, for the time he is actually engaged in the discharge of his duties as a member of the board, and the secretary shall receive (a sum not to exceed twenty-five (\$25.00) dollars per month and) the necessary expenses incurred for services which cannot be performed at the capitol. (All printing, postage, and other contingent expenses necessarily incurred under the provisions of this chapter shall be paid from said fund.**) Any balance of said funds remaining shall be turned over to the state treasurer for the use of the school fund.

*As amended by the Twenty-eighth General Assembly, Chapter 89.

†As amended by Chapter 90, Twenty-eighth General Assembly.

**As amended by the Twenty-seventh General Assembly, Chapter 68.

RELATING TO OSTEOPATHY

CHAPTER 158 TWENTY-NINTH GENERAL ASSEMBLY

SECTION 1. Any person holding a diploma from a legally incorporated school of osteopathy recognized as of good standing by the Iowa Osteopathic Association, and wherein the course of study comprises a term of at least twenty (20) months, or four (4) terms of five (5) months each, in actual attendance at such school, and which shall include instruction in the following branches, to-wit: Anatomy, including dissection of a full lateral half of the cadaver, physiology, chemistry, histology, pathology, gynecology, obstetrics and theory of osteopathy, and two full terms of practice of Osteopathy, shall upon the presentation of such diploma to the state board of medical examiners and satisfying such board that he is the legal holder thereof, be granted by such board an examination on the branches herein named (except upon the theory and practice of osteopathy until such time as there may be appointed an osteopathic physician on the state board of health and of medical examiners). The fee for said examination, which shall accompany the application, shall be ten dollars (\$10) and the examination shall be conducted in the same manner, and at the same place and on the same date that physicians are examined as prescribed by section twenty-five hundred and seventy-six (2576) of the Code. The same general average shall be required as in cases of physicians; provided that osteopaths who are graduates of legally incorporated schools of osteopathy as above recognized and who are at the time of the passage of this act engaged in the practice of osteopathy in Iowa, shall be entitled to receive a certificate upon the payment of the prescribed fee without such examination. Upon passing a satisfactory examination as above prescribed the said board of medical examiners shall issue a certificate to the applicant therefor, signed by the president and secretary of said board, which certificate shall authorize the holder thereof to practice osteopathy in the state of Iowa. This certificate when issued shall be registered with the recorder of the county in which the holder thereof resides and for which he shall pay a fee of fifty cents (50 cents). And the holder thereof shall not be subject to the provisions of section two thousand five hundred eighty (2580) of the Code.

SEC. 2. The certificate provided for in the foregoing section shall not authorize the holder thereof to prescribe or use drugs in his practice, nor to perform major or operative surgery.

SEC. 3. The board of medical examiners may refuse to grant a certificate to any person otherwise qualified, who is not of good moral character. For like cause, or for incompetency, or habitual intoxication, or upon satisfactory evidence by affidavit or otherwise that a certificate had been granted upon false and fraudulent statements as to graduation or length of practice, the said board may revoke a certificate by an affirmative vote of at least five (5) members of the board, which number shall include one or more members of the different schools of medicine represented in said board. After the revocation of a certificate, the holder thereof shall not practice osteopathy, surgery, or obstetrics in the state.

SEC. 4. Any person who shall present to the board of medical examiners a fraudulent or false diploma, or one of which he is not the rightful owner, for the purpose of procuring a certificate as herein provided, or shall file, with the recorder of any county in the state the certificate of another as his own, or who shall falsely personate any one to whom a certificate has been granted by such board, or shall practice osteopathy, surgery or obstetrics in the state without having first obtained and filed for record the certificate herein required, and who is not embraced in any of the exceptions contained in this chapter, or who continues to practice osteopathy, surgery or obstetrics, after the revocation of his certificate, is guilty of a misdemeanor, and, upon conviction thereof, shall be fined not less than three hundred dollars (\$300), nor more than five hundred (\$500) and costs of prosecution, and shall be committed to the county jail until such fine is paid; and whoever shall file or attempt to file with the recorder of any county in the state the certificate of another with the name of the party to whom it was granted or issued, erased, and the claimant's name inserted, or shall file or attempt to file with the board of medical examiners any false or forged affidavit of identification, shall be guilty of forgery.

SEC. 5. Every person practicing osteopathy, or obstetrics, or professing to treat, cure or heal diseases, ailments or injury by any osteopathic appliance or method, who goes from place to place, or from house to house, or by circulars, letters or advertisements solicits persons to meet him for professional treatment at places other than his office at the place of his residence, shall be considered an itinerant osteopath; and such itinerant osteopath shall, in addition to the certificate elsewhere provided for in this chapter, procure from the state board of medical examiners a license as an itinerant, for which he shall pay to the treasurer of state, for the use of the state of Iowa, the sum of two hundred and fifty dollars (\$250) per annum. Upon payment of this sum, the secretary shall issue to the applicant therefor a license to practice within the state, as an itinerant osteopath, for one year from the date thereof. The board may, for satisfactory reasons, refuse to issue such license, or may cancel such license upon satisfactory evidence of incompetency or gross immorality.

SEC. 6. All acts and parts of acts in conflict herewith are hereby repealed.

Passed and approved April 8, 1902.

RELATING TO BODIES FOR MEDICAL PURPOSES

CHAPTER 129, LAWS TWENTY-EIGHTH GENERAL ASSEMBLY

Be it enacted by the General Assembly of the State of Iowa:

SECTION 1. *Repealed.* That section forty-nine hundred and forty-six (4946) of the Code be and the same is hereby repealed, and the following enacted as a substitute therefor.

SEC. 2. *Bodies for medical purposes—how distributed.* Every coroner, undertaker, superintendent, or managing officer of any public asylum, hospital, poor house, or penitentiary in this state, shall deliver the bodies of uninterred deceased persons in his charge suitable for scientific purposes with the consent of the friends or relatives, if known, and without such consent if not known, to medical colleges or schools within the state, for the purpose of scientific medical study, unless the deceased person expressed a desire during his last illness that his body should be buried or cremated; such bodies shall be equitably distributed among the medical colleges and schools in the state under such rules and regulations as may be adopted by the state board of health, and the number so distributed shall be in proportion to the number of students matriculated at each medical college or school. The expense of such distribution shall be paid by the medical college or school receiving the bodies. If there shall be more bodies than are required by the medical colleges or schools of the state, the same may be delivered to physicians in the state, under such rules and regulations as may be adopted by the state board of health.

SEC. 3. *Duties of various officers.* It shall be the duty of every such coroner, undertaker, superintendent, or managing officer of a public asylum, hospital, poor house or penitentiary, as soon as any such body shall come into his custody, or as soon as any person shall die, whose body, under the provisions hereof, should be delivered to a medical college or school, to at once notify the secretary of the state board of health by telegram of the fact, and to hold such body unburied for forty-eight hours thereafter, and to deliver the body to such medical college or school as the secretary of the state board of health may direct. If, however, such body is subsequently claimed by any relative or friend, it shall be at once, by the person or persons having the same in charge, or by the medical college or school to which it has been delivered, surrendered to such relative or friend for burial.

SEC. 4. *Body held subject to claim.* Every medical college or school, or person receiving the body of any deceased person under the provisions hereof, shall hold the same for a period of sixty days, subject to the claim of relatives or friends.

SEC. 5. *Penalties.* Any coroner, undertaker, superintendent or managing officer of any public asylum, hospital, poor house or penitentiary within this state into whose hands the body of a deceased person shall come, which should be delivered to a medical college or school under the provisions hereof, who shall wilfully neglect or refuse to notify the secretary of the state board of health of the existence of such body, or refuse to deliver the same to a medical college or school upon the direction of the secretary of the state board of health, as herein provided, shall be guilty of a misdemeanor, and upon conviction thereof be fined any sum not exceeding fifty dollars; and any person who shall receive or deliver any body or remains knowing that any of the provisions of this act have been violated, shall be imprisoned in the penitentiary not more than two years, or fined not exceeding twenty-five hundred dollars, or both.

Approved April 16, 1900.

INSPECTION AND USE OF PRODUCTS OF PETROLEUM

CHAPTER 83, LAWS TWENTY-EIGHTH GENERAL ASSEMBLY

SEC. 1. *Use of gasoline lamps.* That section two thousand five hundred and eight (2508) of the Code, as amended by chapter sixty-two of the acts Twenty-seventh General Assembly, be, and the same is hereby, amended by striking out the words, "the Wellsbach hydro-carbon incandescent lamp" in the twenty-third line thereof, and inserting in lieu thereof, the following: "Such lamps which, having been submitted to the state board of health and having been examined and tested by said board shall be found to be safe for the use of the public."

SEC. 2. *Duties of state board of health.* The state board of health shall examine the particular design, mechanism, and workmanship of such lamps as shall be presented to such board, and test said lamps, and, if it shall find any lamp to be safe, said board shall enter the findings of the board upon the records of the proceedings of said board. The board shall have power, in case it comes to the notice of the board that any lamp which it has heretofore approved as safe, because either of change of design, the use of unsuitable material, or poor workmanship in the construction of such lamps, or for any other cause, is unsafe as then manufactured, and dangerous to public safety, to cancel its approval of such lamp, and after such cancellation of the approval of said lamp it shall be unlawful to use the same, and no lamps manufactured or sold after such disapproval shall be used in burning the lighter products of petroleum for illuminating purposes.

USE OF GASOLENE, BENZINE, NAPHTHA AND OTHER EXPLOSIVES IN TENEMENTS

CHAPTER 130 LAWS TWENTY-EIGHTH GENERAL ASSEMBLY

SEC. 1. *Use of dangerous fluids forbidden.* That it shall be unlawful for any person to establish or operate any dye works, pantorium, or cleaning works, in which gasoline, benzine, naphtha, or other explosive or dangerous fluids are used for the purpose of cleaning or renovating wearing apparel or other fabrics, in any building any part of which is used as a residence or lodging house.

SEC. 2. *Penalty.* Any person convicted of violating the provisions of the foregoing section shall be fined in a sum not exceeding fifty (50) nor less than ten (10) dollars.

BOXING CONTESTS OR SPARRING EXHIBITIONS

CHAPTER 133, LAWS TWENTY-EIGHTH GENERAL ASSEMBLY

SECTION 1. *Penalty.* Whoever engages in any boxing contest or sparring exhibition with or without gloves for a prize, reward, or anything of value, at which an admission fee is charged or received, either directly or indirectly, and whoever knowingly aids, abets, or assists in any such boxing contest or sparring exhibition, and any owner or lessee of any ground, lot, building, hall, or structure of any kind knowingly permitting the same to be used for such boxing contest or sparring exhibition, shall be fined not exceeding three hundred dollars, or imprisonment in the county jail not exceeding ninety days.

MISCELLANEOUS—FROM THE CODE

MINERS—PROVISIONS FOR THEIR SAFETY

SEC. 2486. *Escape and air shafts.* The owner or person in charge of any mine operated by shaft, or one having a slope or drift opening in which five or more men are employed, shall construct and maintain at least two distinct openings for each seam of coal worked, which in shaft mines shall be separated by natural strata of not less than one hundred feet in breadth, and in slope or drift mines not less than fifty feet in breadth, through which ingress and egress at all times shall be unobstructed to the employees, and in slope or drift mines shall be provided with safe and available travelingways; all traveling ways and escapes to be kept free from water and falls of roof. All escape-shafts not provided with hoisting appliances as hereinafter provided shall have stairs at an angle of not more than sixty degrees in descent, kept in safe condition, with proper landings at easy and convenient distances apart. He shall provide all air-shafts where fans are used with working fans for ventilation, and those used for escapes with suitable appliances for hoisting underground workmen, at all times ready for use while the men are at labor, and no combustible material shall be allowed to be or remain between any escape-shaft and hoisting-shaft, save as it may be absolutely necessary in the operation of the mine. A furnace-shaft, if large enough, may be divided into an escape and a furnace-shaft, the partition to be of incombustible material for a distance of not less than fifteen feet from the bottom thereof, and so constructed throughout as to exclude the heated air and smoke from the side used as an escape-shaft. Where two or more mines are connected underground the several owners, by joint agreement, may use the hoisting-shaft or slope of the one as an escape for the other. In all cases where escape-shafts are constructed less than one hundred feet from the hoisting-shaft, there shall be built and maintained an underground traveling-way from the top of the escape-shaft, so as to furnish the proper protection from fire

for a distance of one hundred feet from such hoisting-shaft. No escape-shaft shall be located or constructed without first giving notice to the district inspector, who shall determine the distance it shall be from the main shaft, and without his consent it shall not be less than 300 feet, nor shall any building except the fan-house be placed nearer than 100 feet of the escape; but the provisions of this chapter relating to escape-ways shall not apply to mines where the same are lost or destroyed by reason of the drawing of pillars preparatory to the abandonment of the mine, and in such mine not more than twenty persons shall be employed at one time.

Sec. 2488. *Ventilation.* The owner or person in charge of any mine shall provide and maintain, whether the mine be operated by shaft, slope or drift, an amount of ventilation of not less than 100 cubic feet of air per minute for each person, nor less than 500 cubic feet of air per minute for each mule or horse employed therein, which shall be so circulated throughout the mines as to dilute, render harmless and expel all noxious and poisonous gases in all working parts of the same; to do this, artificial means by exhaust steam, forcing-fans, furnaces, or other contrivances of sufficient capacity and power, shall be kept in operation. If a furnace is used, it shall be so constructed, by lining the up-cast for a sufficient distance with incombustible material, that fire cannot be communicated to any part of the works. When the mine inspector shall find the air insufficient, or the men working under unsafe conditions, he shall at once give notice to the mine owner or his agent or person in charge, and, upon a failure to make the necessary changes within a reasonable time, to be fixed by him, he may order the men out, to remain out until the mine is put in proper condition.

Sec. 2489. *Safety appliances—competent engineers—boys not employed.* The owner or person in charge of any mine shall in all mines operated by shaft or slope, where the voice cannot be distinctly heard, provide and maintain a metal speaking tube or other means of communication, kept in complete order from the bottom or interior to the top or exterior, also a sufficient safety catch and proper cover overhead on all cages, and an adequate brake to all drums or other devices used for lowering or hoisting persons, an approved safety gate at the top of each shaft, springs at the top of each slope, and a trail attached to each train used therein. He shall not knowingly place in charge of any engine used in or about the operation of the mines any but experienced, competent and sober engineers, who shall not allow anyone but those designated for that purpose to handle or in any way interfere with it or any part of the machinery, nor shall more than ten persons be allowed to descend or ascend in any cage at one time, or such less number as may be fixed by the district mine inspector, nor anyone but the conductor on a loaded cage or car. He shall not allow a boy under twelve years of age to work in the mines, and, when in doubt regarding the age of one seeking employment, shall, before engaging him, obtain the affidavit of the applicant's parent or guardian in regard thereto. He shall at all times keep a sufficient supply of timber to be used as props, convenient and ready for use, and shall send such props down when required and deliver them to the places where needed.

TO PREVENT ACCIDENTS BY RAILWAYS

Sec. 2054. *Cattle-guards—crossings—signs.* Every corporation constructing or operating a railway shall make proper cattle-guards where the same enters or leaves any improved or fenced land, and construct at all points where such railway crosses any public road good, sufficient and safe crossings and cattle-guards, and shall erect at such points, at a sufficient elevation from such road as to admit of free passage of vehicles of every kind, a sign with large and distinct letters placed thereon, to give notice of the proximity of the railway, and warn persons of the necessity of looking out for trains. Any railway company neglecting or refusing to comply with the provisions of this section shall be liable for all damages sustained by reason of such refusal or neglect, and it shall only be necessary, in order to recover, for the injured party to prove such neglect or refusal.

Sec. 2060. *Interlocking switches.* When in any case two or more railroads cross each other at a common grade, or a railroad crosses a stream by swing or drawbridge, they may be equipped therewith an interlocking switch system, or other suitable safety device rendering it safe for engines or trains to pass thereover without stopping, and if such interlocking switch system, or other safety device shall have been approved by the railroad Commissioners, then the engines and trains of such railroad or railroads may pass over such crossings or bridge without stopping, the provisions of any other law to the contrary notwithstanding.

Sec. 2071. *Liability for negligence or wrongs of employees.* Every corporation operating a railway shall be liable for all damages sustained by any person, including employees of such corporation, in consequence of the neglect of the agents, or by any mismanagement of the engineers or other employees thereof, and in consequence of the wilful wrongs, whether of commission or omission, of such agents, engineers or other employees, when such wrongs are in any manner connected with the use and operation of any railway on or about which they shall be employed, and no contract which restricts such liability shall be legal or binding. Nor shall any contract of insurance, relief, benefit, or indemnity in case of injury or death, entered into prior to the injury between the person so injured and such corporation, or acceptance of any such insurance relief, benefit, or indemnity by the person injured, his widow, heirs, or legal representatives after the injury, from such corporation, person, or association, constitute any bar or defense to any cause of action brought under the provisions of this section, but nothing contained herein shall be construed to prevent or invalidate any settlement for damages between the parties subsequent to injuries received.

Sec. 2072. *Signals at road crossings.* A bell and a steam whistle shall be placed on each locomotive engine operated on any railway, which whistle shall be twice sharply sounded at least sixty rods before a road crossing is reached, and after the sounding of the whistle the bell shall be rung continuously until the crossing is passed; but at street crossings within the limits of cities or towns the sounding of the

whistle may be omitted, unless required by ordinance or resolution of the council thereof; and the company shall be liable for all damages which shall be sustained by any person by reason of such neglect. Any officer or employee of any railway company violating any of the provisions of this section shall be punished by a fine not exceeding one hundred dollars for each offense.

Sec. 2073. *Stopping at railway crossings.* All trains run upon any railroad in this state which intersects or crosses any other railroad upon the same level shall be brought to a full stop at a distance of not less than two hundred nor more than eight hundred feet from the point of intersection or crossing, before such intersection or crossing is passed, except as otherwise provided in this Chapter. Any engineer violating the provisions of this section shall forfeit one hundred (100) dollars for each offense, to be recovered in an action in the name of the State for the benefit of the school fund and the corporation on whose road such offense is committed shall forfeit the sum of two hundred (200) dollars for each offense, to be recovered in like manner.

Sec. 2074. *Contract or rule limiting liability.* No contract, receipt, rule or regulation shall exempt any railway corporation engaged in transporting persons or property from the liability of a common carrier, or carrier of passengers, which would exist had no contract, receipt, rule or regulation been made or entered into.

Sec. 2079. *Couplers on new or repaired cars.* No corporation, company or person operating any line of railroad within this state, or any car manufacturer or transportation company using or leasing cars therein, shall put in use any new car or any old one that has been to the shop for general repairs to one or both of its drawbars, that is not equipped with automatic couplers so constructed as to enable any person to couple or uncouple them without going between them.

Sec. 2080. *On all cars.* After January 1, 1898, no corporation, company or person, operating a railroad, or any transportation company using or leasing cars, shall have upon any railroad in this state any car that is not equipped with such safety automatic coupler.

Sec. 2081. *Driver brake on engines.* No corporation, company or person operating any line of railroad in the state shall use any locomotive engine upon any railroad or in any railroad yard in the state that is not equipped with a proper and efficient power brake, commonly called a "driver brake".

Sec. 2082. *Power brake on cars.* No corporation, company or person operating a line of railroad in the state shall run any train of cars that shall not have therein a sufficient number of cars with some kind of efficient automatic or power brake to enable the engineer to control the train without requiring brakemen to go between the ends or the top of the cars to use the hand brake.

Sec. 2083. *Penalty.* Any corporation, company or persons operating a railroad in this state and using a locomotive engine, or running a train of cars, or using any freight, way or other car contrary to the provisions of the four preceding sections, shall be guilty of a misdemeanor, and shall be subject to a fine of not less than five hundred

nor more than one thousand dollars for each and every offense; but such penalties shall not apply to companies hauling cars belonging to railroads other than those of this state which are engaged in interstate traffic. Any railway employee who may be injured by the running of such engine, train or car contrary to the provisions of said sections shall not be considered as waiving his right to recover damages by continuing in the employ of the corporation, company or person operating such engine, train or cars.

OPTUM SMOKING

Sec. 5003. Any person who shall keep and maintain any shop, house, room or other place to be resorted to by any other persons, in which opium or any of its preparations or compounds is sold or given away to be smoked or used in such place, or who allows opium or any of its preparations to be smoked in such shop, house, room or other place, and every person who resorts to such shop, house, room or other place for the purpose of smoking opium or its preparations and compounds, shall be deemed guilty of a misdemeanor and upon conviction thereof shall be fined not exceeding five hundred dollars, or imprisoned in the county jail not exceeding six months, or both. The state, upon the trial of any person indicted for keeping a place described in this section, may, for the purpose of establishing the character of the place so kept by the defendant, introduce evidence of the general reputation of such place so kept, and such evidence shall be competent for such purpose.

SELLING FIREARMS TO MINORS

Sec. 5004. No person shall knowingly sell, present or give any pistol, revolver or toy pistol to any minor. Any violation of this section shall be punished by a fine of not less than twenty-five nor more than one hundred dollars, or by imprisonment in the county jail not less than ten or more than thirty days.

SALE OF TOBACCO TO MINORS.

Sec. 5005. No person shall directly or indirectly, by himself or agent, sell, barter or give to any minor under sixteen years of age any cigar or tobacco in any form whatever, except upon the written order of his parent or guardian. Any violation of this section shall be punished by a fine of not less than five nor more than one hundred dollars, and the offender shall stand committed until fine and costs of prosecution are paid.

SALE OF CIGARETTES

Sec. 5006. No one, by himself, clerk, servant, employee or agent, shall, for himself or any person else, directly or indirectly, or upon any pretense, or by any device, manufacture, sell, exchange, barter, dispense, give in consideration of the purchase of any property, of any services, or in evasion hereof, or keep for sale, any cigarettes or cigarette paper or cigarette wrappers, or any paper made or prepared for the purpose

of making cigarettes, or for the purpose of being filled with tobacco for smoking; or own or keep, or be in any way concerned, engaged or employed in owning or keeping, any such cigarettes or cigarette paper or wrappers, with intent to violate any provision of this section; or authorize or permit the same to be done. Whoever is found guilty of violating any of the provisions of this section, for the first offense shall pay a fine of not less than twenty-five dollars nor more than fifty dollars and costs of prosecution, and stand committed to the county jail until such fine and costs are paid; for the second and each subsequent offense, he shall pay, upon conviction thereof, a fine of not less than one hundred dollars nor more than five hundred dollars and the costs of prosecution, or be imprisoned in county jail not to exceed six months: provided that the provisions hereof shall not apply to the sales of jobbers doing an interstate business with customers outside the state.

USE OF BARBED WIRE

SEC. 2817. Barbed wire shall not be used to enclose any school buildings or grounds, nor for any fence or other purpose within ten feet of any such grounds. Any person violating the provisions of this section shall be punished by fine not exceeding twenty-five dollars.

SEC. 2403. *Selling or giving (intoxicating liquors) to minor or intoxicated person or persons in the habit of becoming intoxicated.* No person by himself, agent or otherwise, shall in any manner procure for, or shall sell or give any intoxicating liquors to any minor for any purpose, except upon written order of his parent, guardian or family physician, give to or in any manner procure for, or sell the same to any intoxicated person or one in the habit of becoming intoxicated. Any person violating the provisions of this section shall forfeit and pay the sum of one hundred dollars, to be collected by action against him, or, if a permit holder, against him and the sureties on his bond. Such action may be brought by any citizen of the county. One-half of the amount collected shall go to the informer and one-half to the school fund of the county.

SEC. 2418. *Civil action for damages by wife, parent or child, etc.* Every wife, child, parent, guardian, employer or other person who shall be injured in person or property or means of support by any intoxicated person, or in consequence of the intoxication, habitual or otherwise, of any person, shall have a right of action in his or her own name against any person who shall, by selling or giving to another contrary to the provisions of this chapter any intoxicating liquors, cause the intoxication of such person, for all damages actually sustained, as well as exemplary damages; and a married woman shall have the same right to bring suits, prosecute, and control the same and the amount recovered, as if a single woman; and all damages recovered by a minor under this section shall be paid either to such minor or his parent, guardian or next friend, as the court shall direct, and all suits for damages under this section shall be by civil action in any court having jurisdiction thereof.

SEC. 4727. *Murder.* Whoever kills any human being with malice aforethought, either expressed or implied, is guilty of murder.

SEC. 4728. *First degree.* All murder which is perpetrated by means of poison, or lying in wait, or any other kind of wilful, deliberate and premeditated killing, or which is committed in the perpetration or attempt to perpetrate any arson, rape, robbery, mayhem or burglary, is murder in the first degree, and shall be punished with death, or imprisonment for life at hard labor in the penitentiary, as determined by the jury, or by the court if the defendant pleads guilty.

SEC. 4729. *Second degree.* Whoever commits murder otherwise than as set forth in the preceding section is guilty of murder in the second degree, and shall be punished by imprisonment in the penitentiary for life, or for a term of not less than ten years.

SEC. 4747. *Killing in duel.* Whoever fights a duel with deadly weapons, and inflicts a mortal wound on his antagonist, is guilty of murder in the first degree, and shall be punished accordingly.

SEC. 4748. *Duelling—challenge.* Any person who fights a duel with deadly weapons, or is present thereat as aid, second or surgeon, or advises, encourages or promotes the same, although no homicide ensue; and any person who challenges another to fight a duel, or sends or delivers any verbal or written message purporting or intended to be such challenge, although no duel ensue, shall be fined in a sum not exceeding one thousand dollars nor less than four hundred dollars and imprisoned in the penitentiary not more than three nor less than one year.

SEC. 4751. *Manslaughter.* Any person guilty of the crime of manslaughter shall be imprisoned in the penitentiary not exceeding eight years, and fined not exceeding one thousand dollars.

SEC. 4752. *Maiming or disfiguring.* If any person, with intent to maim or disfigure, or to maim the tongue; cut out or destroy an eye; cut, slit or tear off an ear; cut, bite, slit or mutilate the nose or lip; cut off or disable a limb or any member of another person, he shall be imprisoned in the penitentiary not more than five years, and fined not exceeding one thousand nor less than one hundred dollars.

SEC. 5036. *Engaging in prize fight.* Whoever engages as principal in any prize fight shall be fined not less than one hundred nor more than one thousand dollars, or be imprisoned in the penitentiary for a term of not more than one year, or both.

SEC. 5037. *Aiding or abetting.* Whoever aids or assists in any prize fight shall be fined not exceeding five hundred dollars, or imprisoned in the county jail for not more than one hundred and fifty days.

SEC. 5039. *Racing or fast driving on highways.* Any person who shall be guilty of racing or driving upon the public highway, in a manner likely to endanger the persons or lives of others, shall be guilty of a misdemeanor, and shall be fined not exceeding one hundred dollars, or be imprisoned in the county jail not exceeding thirty days.

SEC. 4768. *Assault with intent to murder.* If any person assault another with intent to commit murder, he shall be imprisoned in the penitentiary not exceeding ten years.

Sec. 4771. *With intent to inflict great bodily injury.* If any person assault another with intent to inflict a great bodily injury he shall be imprisoned in the county jail not exceeding one year, or be fined not exceeding five hundred dollars.

Sec. 4773. *Mingling poison with food, etc.* If any person mingle any poison with any food, drink or medicine, with intent to kill or injure any human being, or wilfully poison any spring, well, cistern or reservoir of water, he shall be imprisoned in the penitentiary not exceeding ten years, and be fined not exceeding one thousand dollars.

Sec. 4775. *Carrying concealed weapons.* If any person carry upon his person any concealed weapon, or shall wilfully draw and point a pistol, revolver or gun at another, he shall be guilty of a misdemeanor, and be fined not more than one hundred dollars, or imprisoned in the county jail not more than thirty days; but this section shall not apply to police officers and others persons whose duty it is to execute process or warrants, or make arrests.

Sec. 4776. *Burning inhabited dwelling in nighttime.* If any person wilfully or maliciously burn in the nighttime the inhabited building, boat or vessel of another, or wilfully and maliciously set fire to any other building, boat or vessel owned by himself or another, by burning whereof such inhabited building, boat or vessel is burnt in the nighttime, he shall be imprisoned in the penitentiary for life or any term of years.

Sec. 4759. *Attempt to produce miscarriage.* If any person, with intent to produce the miscarriage of any pregnant woman, wilfully administer to her any drug or substance whatever, or with such intent, use any instrument or other means whatever, unless such miscarriage shall be necessary to save her life, he shall be imprisoned in the penitentiary for a term not exceeding five years, and be fined in a sum not exceeding one thousand dollars.

Sec. 4766. *Exposing child.* If the father or mother of any child under the age of six years, or any person to whom such child has been entrusted or confided, expose such child in any highway, street, field, house or outhouse, or any other place, with intent wholly to abandon it, he or she, upon conviction thereof, shall be imprisoned in the penitentiary not exceeding five years.

Sec. 4796. *Death caused by dynamiting.* If any person wilfully deposits or throws in, under or about any dwellinghouse, building, boat, vessel or raft or other inhabited place, where its explosion will or is likely to destroy or injure the same, any dynamite, nitroglycerine, giant powder or other material, and by reason of the explosion thereof any person is killed, he shall be guilty of murder,

Sec. 4797. *Or injury to person.* If any person wilfully deposits or throws any dynamite, nitroglycerine or giant powder or other explosive material as provided in the preceding section, and by means of the explosion thereof any person is injured, he shall be guilty of an assault with intent to commit murder.

Sec. 4809. *Placing obstructions on railways.* If any person shall wilfully and maliciously place any obstruction on the track of any railroad in the state, or remove any rail therefrom, or in any other way injure such railroad, or do any thing thereto whereby the life of any person is or may be endangered, he shall be imprisoned in the penitentiary for life, or for any term not less than two years.

Sec. 4810. *Shooting or throwing at train.* If any person throw any stone or other substance whatever, or present or discharge any gun, pistol or other firearm at any railroad train, car or locomotive engine, he shall be guilty of a misdemeanor.

Sec. 4812. *Uncoupling locomotive or cars.* If any person shall wilfully and maliciously uncouple or detach the locomotive or tender or any of the cars of any railroad train, or in any manner aid, abet or procure the doing of the same, such person shall be imprisoned in the penitentiary not exceeding five years, or fined not exceeding one thousand dollars, or both, at the discretion of the court.

Sec. 4945. *Violating sepulchre.* If any person, without lawful authority, wilfully dig up, disinter, remove or carry away any human body, or the remains thereof, from its place of interment; or aid, assist, encourage, incite or procure the same to be done or attempted; * * * he shall be imprisoned in the penitentiary not more than two years, or be fined not exceeding twenty-five hundred dollars, or both.

Sec. 5025. *Boxing tumbling rods of threshing machines.* If any person run any threshing machine in this state without having two lengths of tumbling rods next to the machine together with the knuckles or joints and jacks of the tumbling rods safely boxed and secured while the machine is running, he shall be fined not less than ten nor more than fifty dollars for every day or part of day he shall violate this section.

Sec. 5026. *Steam boilers.* Any person owning or operating steam boilers in this state shall provide the same with steam gauge, safety-valve and water gauge, and keep the same in good order. Any person neglecting so to do shall be fined not less than fifty nor more than five hundred dollars.

Sec. 4999. *Seats for female employees.* All employers of females in any mercantile or manufacturing business or occupation shall provide and maintain suitable seats, when practicable, for the use of such female employees, at or beside the counter or work bench where employed, and permit the use thereof by such employees to such extent as the work engaged in may reasonably admit of. Any neglect or refusal to comply with the provisions of this section by any employer shall be punished by a fine not exceeding ten dollars.

Sec. 5078. *What deemed nuisances.* The erecting, continuing or using any building or other place for the exercise of any trade, employment or manufacture which, by occasioning noxious exhalations, offensive smells or other annoyances, becomes injurious and dangerous to the health, comfort or property of individuals or the public; the causing or suffering any offal, filth or noisome substance to be collected or to remain in any place to the prejudice of others; the obstructing or impeding without legal authority the passage of any navigable river,

harbor or collection of water; or the corrupting or rendering unwholesome or impure the water of any river, stream or pond, or unlawfully diverting the same from its natural course or state, to the injury or prejudice of others; and the obstructing or incumbering by fences, buildings or otherwise the public roads, private ways, streets, alleys, commons, landing places or burying-grounds, are nuisances.

SEC. 5079. *Manufacture of gunpowder.* If any person carry on the business of manufacturing gunpowder, or of mixing or grinding the composition therefor, in any building within eighty rods of any valuable building erected at the time when such business may be commenced, the building in which such business is thus carried on is a public nuisance.

SEC. 5081. *Penalty—abatement.* Whoever is convicted of erecting causing or continuing a public or common nuisance as provided in this chapter, (chapter 14, title xxiv), or at common law when the same has not been modified or repealed by statute, where no other punishment therefor is especially provided, shall be fined not exceeding one thousand dollars, and the court, with or without such fine, may order such nuisance abated, and issue a warrant as hereinafter provided.

SEC. 4976. *Sale of poison without label.* If any apothecary, druggist or other person deliver to another any arsenic, corrosive sublimate, prussic acid or other poisonous liquid or substance without having the word "poison" and the true name thereof written or printed upon a label attached to or affixed upon the vial, box or parcel containing the same, he shall be guilty of a misdemeanor.

SEC. 4977. *Spreading infectious disease.* If any person inoculate himself or any other person or suffer himself to be inoculated with the smallpox within the state, or come within the state with the intent to cause the prevalence or spread of this infectious disease, he shall be imprisoned in the penitentiary not more than three years, or be fined not exceeding one thousand dollars and imprisoned in the county jail not exceeding one year.

SEC. 4978. *Putting infected person on public conveyance.* If any person shall place or put, or aid or abet in placing or putting, any person upon any railroad car, steamboat or other public conveyance, knowing such person to be infected with diphtheria, smallpox or scarlet fever, he shall be fined not more than one hundred dollars or be imprisoned in the county jail not more than thirty days.

SEC. 4980. *Selling drugged liquors.* If any person wilfully sell or keep for sale intoxicating, malt or vinous liquors, which have been adulterated or drugged by admixture with any deleterious or poisonous substance, he shall be fined not exceeding five hundred dollars, or be imprisoned in the penitentiary not exceeding two years.

SEC. 4982. *Adulterating food or liquor.* If any person adulterate for the purpose of sale any substance intended for food, or any wine, spirituous, malt or other liquor intended for drinking, he shall be imprisoned in the county jail not more than one year, or be fined not exceeding three hundred dollars, and the article so adulterated destroyed.

SEC. 4983. *Drugs or medicines.* If any person adulterate for the purpose of sale any drug or medicine in such manner as to lessen the efficacy or change the operation of such drug or medicine, or to make it injurious to health, or sell it knowing that it is thus adulterated, he shall be imprisoned in the county jail not exceeding one year, or be fined not exceeding five hundred dollars, and such adulterated drugs and medicines destroyed.

SEC. 4984. *Other adulterations.* No person shall mix, color, stain or powder, or order or permit any other person to mix, color, stain or powder, any article of food or confections with any ingredient or material so as to render the article injurious to health, with the intent that the same may be sold, and no person shall sell or offer for sale any such articles.

SEC. 4985. *With intent to sell.* No person shall, except for the purpose of compounding in the necessary preparation of medicine, mix, color, stain or powder, or permit any other person to mix, color, stain or powder any drug or medicine with any ingredients or materials, so as to affect injuriously the quality or potency of such drug or medicine, with the intent to sell the same, or shall offer for sale any such drug or medicine.

SEC. 4986. *Labeling.* No person shall mix, color, stain or powder any article of food, drink or medicine, or any article which enters into the composition of food, drink, or medicine, with any other ingredient or material, whether injurious to health or not, for the purpose of gain or profit, or sell or offer for sale the same, or order or permit any other person to sell or offer for sale any article so mixed, colored, stained or powdered, unless the same be so manufactured, used or sold or offered for sale, under its true and appropriate name, and notice that the same is mixed or impure is marked, printed or stamped upon each package, roll, parcel or vessel containing the same, so as to be and remain at all time readily visible, or unless the person purchasing the same is fully informed by the seller of the true names of the ingredients (if other than such as are known by the common name thereof) of such articles at the time of making the sale thereof or offering to sell the same; but nothing in this section shall prevent the use of harmless coloring material used in coloring butter and cheese.

SEC. 4987. *Glucose—skimmed-milk cheese—oleomargarin.* No person shall mix any glucose or grape sugar with syrup or sugar intended for human food, or shall mix or mingle any glucose or grape sugar with any article, without distinctly marking, stamping or labeling the article or the package containing the same with the true and appropriate name of such article, and the percentage in which glucose or grape sugar enters into its composition. Nor shall any person sell or offer for sale, or permit to be sold or offered for sale, any such food, into the composition of which glucose or grape sugar has entered, without at the same time informing the buyer of the fact, and the proportion in which glucose or grape sugar has entered into the composition.

Sec. 4988. *Penalty.* Any person violating any provision of the four preceding sections shall, for the first offense, be fined not less than ten nor more than fifty dollars; for the second offense, not less than twenty-five nor more than one hundred dollars, or imprisoned in the county jail for not more than thirty days; for the third or any subsequent offense, not less than five hundred nor more than one thousand dollars, and imprisoned in the penitentiary not less than one nor more than five years.

Sec. 5015. The owner or person having charge of any swine any of which die or are killed on account of any disease, shall upon such fact coming to his knowledge, immediately burn the same.

Sec. 5016. No person shall sell or give away or offer for sale any swine that have died of any disease, or that have been killed on account of any disease.

Sec. 4979. If any person throw, or cause to be thrown, any dead animal into any river, well, spring, cistern, reservoir, stream or pond, he shall be imprisoned in the county jail not less than ten nor more than thirty days, or be fined not less than five nor more than one hundred dollars.

Sec. 4981. If any person knowingly sell any kind of diseased, corrupted or unwholesome provisions, whether for meat or drink, without making the nature and condition of same fully known to the buyer, he shall be imprisoned in the county jail not more than thirty days, or be fined not exceeding one hundred dollars.

The flesh of pregnant animals must not be sold nor used for human food after the seventh month of pregnancy for cows, and the tenth week for sows.—*Regulations of the State Board of Health.*

Appendix

Rules and Regulations of the State Board of Health

Restriction and Prevention of Infectious Diseases

CIRCULAR No. 1

Contagious Diseases in the Public and Private Schools of Iowa

CIRCULAR No. 3

TRANSPORTATION OF THE DEAD

XIX
QUARANTINE AND DISINFECTION RULES AND
REGULATIONS

FOR THE PROTECTION OF PUBLIC HEALTH AND FOR THE RESTRICTION AND PRE-
VENTION OF CONTAGIOUS DISEASES

CONTAGIOUS DISEASES

RULE 1. It shall be the duty of every physician residing or practicing within the limits of any city, town or township to give written notice to the Mayor, or Township Clerk (as the case may be) of any case of Asiatic Cholera, Smallpox, Diphtheria, (Membranous Croup), Scarlet Fever (Scarlatina, Scarlet Rash), Typhoid Fever, Measles, Whooping Cough, Leprosy, Chickenpox, Tuberculosis, or Puerperal Fever, that he may be called to attend professionally, within twenty-four hours after he shall first visit and ascertain the character of any such disease named herein. In all cases where no physician is in attendance, it shall be the duty of any person having charge of, or being at the head of any family, or having the care or custody of any lodging rooms to give notice in like manner as required of physicians. Every school teacher and school officer who discovers, or who has knowledge of a case of these contagious diseases, shall cause the fact to be immediately reported to the Mayor, or Clerk of a township.

RULE 2. It shall be the duty of the Mayor or Township Clerk (as the case may be), upon receiving written notice of the existence of a case of Asiatic Cholera, Smallpox, Diphtheria, (Membranous Croup), Scarlet Fever (Scarlatina or Scarlet Rash) to forthwith quarantine the premises, by serving written notice to the occupants thereof, and placing a danger card thereon; and take such measures as may be necessary and proper for the restriction and suppression of such disease; and to investigate all the circumstances attendant upon the occurrence of the same. He shall also make proper provision for the care of the sick. Where the disease is Measles, Whooping Cough, or Chicken Pox, the premises shall not be quarantined, but they shall be placarded with the danger card, but cases of Tuberculosis, Typhoid Fever and Puerperal Fever shall be neither quarantined nor placarded.

And it shall be the further duty of the Mayor or Township Clerk (as the case may be) to disinfect or cause to be disinfected, the premises whereon all such contagious diseases have occurred, together with all infected furniture, bedding, clothing and other articles, as provided by regulations of the State Board of Health.

RULE 3. If any person shall wilfully or maliciously remove or deface, or cause to be removed or defaced, any signal of danger, or cloth or card placed upon the quarantined premises, without the proper authority as provided herein, he shall be prosecuted, as provided by law.

RULE 4. During the existence of any quarantinable contagious or infectious disease, in any family or household, or place, in any city, town or township, and until after the recovery of the sick and the disinfection of the premises where such disease shall have existed, no person residing in such household, family or place, shall be permitted to enter or leave the premises, and no superintendent, teacher or officer of any school shall permit any child or person from any such family, household or place to attend any school without a permit from the Mayor or Township Clerk (as the case may be), upon the recommendation of the attending physician, showing thorough disinfection of the person, clothing and premises. School teachers, who are boarding in a family in which such contagious disease exists, must at once change their place of boarding and lodging, and change and disinfect their clothing. Where the disease is Chicken Pox, Measles or Whooping Cough the children shall be excluded from the public schools and other gatherings until recovery has taken place and the premises disinfected.

QUARANTINE

RULE 5. Quarantine shall be deemed to be:

First.—The serving of a written notice upon the family, and the placing upon such conspicuous place, on each building, hall, lodging room, or place wherein exists a contagious disease, as will best protect the public health, a cloth or card not less than eighteen inches square, having imprinted thereon in large letters the word "Quarantine", the name of the disease, and the words: "No person shall be permitted to enter or leave these premises except as provided by law, while it is quarantined, under the penalty provided by law."

Second.—Separation of the sick from all persons except those in actual attendance.

Third.—That no person shall leave said premises except the attending physician, without a permit therefor signed by the Mayor or Township Clerk (as the case may be).

Fourth.—That no article that has been used on or about a person sick with a contagious or infectious disease shall be removed from the sick room, or from the premises, until the same has been properly disinfected.

RULE 6. Nurses who have been employed to care for persons sick with contagious disease may be released from quarantine when their services are no longer required, upon the order of the Mayor or Township Clerk (as the case may be). Before leaving the premises there must be thorough disinfection of their person and clothing.

RULE 7. Isolation means the complete exclusion of all other persons from the sick except the nurse and attending physician; that the nurse shall be restrained from going to and from the premises, or mingling with the family; that all well persons shall be prevented from contact

with bedding, clothing, food, or other articles that have been used on or about the sick. Where from necessity the parents or family are nurses, the isolation and quarantine applies to them.

RULE 8. Quarantine shall be established and maintained in each and every case for the period named herein, to-wit:

Scarlet Fever.—(Scarlatina, Scarlet Rash), thirty-five days.

Diphtheria.—(Membranous Croup), thirty-five days.

Smallpox.—Forty days.

Asiatic Cholera.—Twenty-one days.

RULE 9. When a family is quarantined for Diphtheria, the head of the family, or bread-winner, may at the discretion of the local Board, have the privilege of attending to his regular business, and of going to and from his house only when complying with the following conditions, and the Mayor or Township Clerk (as the case may be) shall issue a permit therefor:

First.—He shall change his clothing before going to and leaving his home to go to his place of business.

Second.—He shall wash his hands, face, head and beard with a two per cent solution of Carbolic Acid, each time before leaving his home to go to his place of business.

Third.—While in the house he shall not act as nurse nor live in the same room with the sick person.

Fourth.—He shall not attend any public meeting, nor attend any place where persons are congregated.

Fifth.—This privilege shall not be granted to school teachers, nor to any person whose business brings him in intimate contact with children.

Quarantine shall be released in those houses in which diphtheria has been diagnosed when synchronous cultures taken from the noses and throats of all infected persons quarantined show two consecutive negative examinations, providing the regulations of the Board regarding disinfection and fumigation have first been complied with.

Those who have been quarantined with diphtheria patients may be released from quarantine when both nose and throat cultures, on examination by the bacteriologist of the State Board of Health do not show the presence of diphtheria bacilli.

In districts where it is not possible or desired to use the laboratory findings as a means of regulating quarantine, those suffering from diphtheria shall be quarantined for a period of not less than four weeks from initial symptoms, where antitoxin is used, and five weeks where antitoxin is not used.

RULE 10. Whenever there is complete recovery or death of persons who have been sick with a contagious disease, and there are no further exposures thereto, the quarantine may be released, although the period prescribed herein has not elapsed. *Provided*, that no release of quarantine shall be permitted until the following conditions have been complied with:

First.—Seventeen days must have elapsed after the recovery or death of the last case, to which fact the attending physician must certify in writing.

Second.—The entire body of the patient and exposed individuals must be thoroughly washed with five per cent solution of formalin, or with a one to one thousand solution of bichloride of mercury.

Third.—In case of Smallpox, attention to the following additional requirements is imperative. Unvaccinated individuals must be vaccinated at once and kept under quarantine until evidences manifest themselves that the vaccination has been successful. Requirement No. 2 must then be carried out and the individual dismissed. If the vaccination should fail to succeed in the normal period of time, the quarantine must be continued until seventeen days after date of exposure, when requirement No. 2 may be complied with and the individual released. Persons who are able to show proof that they have been successfully vaccinated within the preceding three years before date of exposure, are subject to requirements of No. 2 only.

Persons who have not been vaccinated within a period of three years preceding the date of exposure must be dealt with as unvaccinated individuals according to requirement No. 3.

RULE 11. After death or recovery of persons sick from a contagious or infectious disease, the room, furniture, and other contents not to be destroyed, shall be thoroughly disinfected in accordance with regulations made by the State Board of Health.

RULE 12. No order for the release of quarantine shall be made by the Mayor or Township Clerk (as the case may be), except upon a report from the attending physician stating the number of persons on the quarantined premises sick with the infectious disease in question, their names, ages, and when the disease first appeared in each case, when recovered, and the means, if any, used for disinfection. If the Mayor or Township Clerk (as the case may be), shall find that the regulations of the health officer or some other competent person, and the quarantine and disinfection have been complied with the quarantine shall be forthwith released. If quarantine regulations have been complied with, and proper disinfection has not been done, the Mayor or Township Clerk (as the case may be), shall order it done under the supervision of the health officer or some other competent person, and the quarantine shall be continued until it is done.

RULE 13. No person shall give, lend or sell, or offer for sale, any clothing or other articles liable to convey infection of any contagious disease unless the same have been disinfected and such disinfection approved by the Mayor or Township Clerk (as the case may be).

RULE 14. When Asiatic Cholera, Smallpox, Diphtheria, (Membranous Croup), Scarlet Fever (Scarlatina, Scarlet Rash), Typhoid Fever, Leprosy, Measles, Puerperal Fever, Chicken Pox, or Tuberculosis exists in any house or dwelling place of a dealer in, or seller of milk he shall discontinue, to give, sell, or distribute milk to any person, or to creameries or butter factories, or in anywise handle such milk, until a permit is granted therefor by the Mayor or Township Clerk (as the case may be), countersigned by the health officer. And no person who attends cows, and does the milking, or who has care of milk vessels, or the sale or distribution of milk, shall be permitted to enter any premises or

place wherein exists any of the diseases named herein, nor have any communication, direct or indirect, with any person who resides in, or is an occupant of such infected place; nor shall any milk or butter be given away, sold or distributed from such infected place. Any person, either as principal, agent or employee, who shall violate any of the provisions of this rule shall be prosecuted according to law.

CARE OF THE SICK

RULE 15. A flannel cloth, wrung out of a strong solution of Carbolic acid, should be hung constantly across the door leading into the room in which one sick with either disease specified in Rule 2 is placed.

RULE 16. The discharges from the throat, nose and mouth are extremely dangerous, and those from the skin, eyes, ears, kidneys and bowels are also dangerous, and remain so for a considerable time. Small pieces of rags should be substituted for handkerchiefs, and after having been once used must be burned immediately.

RULE 17. The discharges from the patient's bowels or bladder must be received into vessels containing a solution of Corrosive Sublimate, which, (being a deadly poison, should be so labeled as to avoid accidents); or a strong solution of Carbolic acid or some other disinfectant, and if not buried at once must be thrown into a cesspool or water closet, after having been thoroughly disinfected, but never into a running stream. If buried, it must not be within one hundred feet of any well. All vessels must be kept scrupulously clean and disinfected.

RULE 18. Nurses and attendants must keep themselves and their patients as clean as possible—their own hands frequently washed and disinfected by Carbolic acid solution.

The nurses must be as few as possible, and they must not unnecessarily communicate with other persons. They must wear only such clothes as may be readily washed, which, when removed, must be placed immediately in boiling water and boiled at least thirty minutes. Neither they, nor any other person, should eat anything in the sick room, or which has been there. Gargling, or washing the mouth occasionally with a cleansing fluid is recommended for those exposed to the contagium of the disease.

RULE 19. Food left uneaten by the sick must never be carried where it will infect other persons. It must be burned immediately on removal from the sick room, and the dishes used washed in boiling water, by themselves—never with other dishes.

SMALL POX

Vaccination is the only preventive for Smallpox. Hence it is important that the vaccination be thoroughly done, with reliable lymph, free from all impurities, and with sufficient frequency.

Vaccination is hereby declared to be: "An inoculation, by scarification, puncture or injection beneath the epidermis, of a vaccine which produces, with some constitutional disturbance, the typical vaccine vesicle, which leaves, after the pock has healed, its characteristic scar."

Immediate vaccination after exposure is important for safety. It should be done, if possible, within five days after exposure.

Every infant should be vaccinated within three months after its birth, unless an educated physician advises to the contrary. Should the first attempt fail, it should be repeated at intervals of a fortnight until a true sore is produced.

Every child should be re-vaccinated before it reaches its twelfth year.

DIPHTHERIA

Diphtheria is a most formidable disease, is widely prevalent, and one of the most fatal diseases in this State. It is produced by a specific bacillus which by multiplication produces blood poisoning. It attacks persons of all classes and ages, but most frequently children under sixteen years of age.

In ordinary cases the germ producing diphtheria probably attacks the person by way of the mouth and the air passages.

The period of incubation of diphtheria, or the time from a person's exposure to the disease to his coming down with it like Scarlet Fever, varies somewhat—being usually from a few hours to seven or eight days; in some cases it is twelve or fourteen days.

It has been conclusively demonstrated that the germs of diphtheria retain their vitality in dried dust for an indefinite period of time, and that cold—even to freezing—does not effect its vitality. Hence the importance of destroying by burning or thorough disinfection of all of the discharges.

Its most frequent local manifestations are in the mouth, throat and air passages. When in the mouth, or upper part of the throat only, the disease is, as a rule, less dangerous and fatal, but none the less contagious, than when in the air passages, below the fauces.

Avoid exposure to the disease.

Observe rigidly every measure as given for Scarlet Fever.

Beware of crowded assemblies in ill-ventilated rooms.

All influences which depress the vital powers, and vitiate the fluids of the body, tend to promote the development and spread of this disease by lessening the powers of resistance.

RULE 20. Membranous Croup must be treated as contagious, and be considered for all sanitary purposes as identical with Diphtheria, and all rules applying to the latter apply equally to Membranous Croup.

SCARLET FEVER

Scarlet Fever is one of the most contagious diseases. One attack does not always prevent subsequent attacks. The greatest number of deaths from this disease is of children under ten years of age. Adult persons do sometimes have the disease.

Scarlatina and Scarlet Rash are identical with Scarlet Fever—equally dangerous and equally contagious. They are one and the same disease.

Avoid the special contagium of the disease. This is especially important to be observed by children. Children under ten years of age are

in much greater danger of death from Scarlet Fever than are adults, but adult persons often get and spread the disease, and sometimes die from it. Mild cases in adults may thus cause fatal cases among children. Because of these facts it is dangerous for children to go where adult persons go with almost perfect safety to themselves.

It is probable that the contagium of Scarlet Fever may retain its virulence for some time, and be carried for a long distance in various substances and articles in which it may have found lodgment.

MEASLES

RULE 21. Measles is a highly contagious and often fatal disease, hence it is dangerous to the public health, but is not subject to quarantine regulations.

RULE 22. A danger signal must be placed upon the premises in some conspicuous place; all children of the family must be restricted to the home, and all other children excluded.

The specific poison or contagium of Measles is in the rash which invades the membranes of the nose, throat, lungs and bowels, before, and often more severely than it invades the skin, so that it is contagious before the eruption appears on the skin.

This disease comes on like what is commonly called "a cold in the head", eyes watery and red; sensitive to light; watery discharge from the nose; fever; hoarse, dry, husky and painful cough; an eruption in the roof of the mouth, with or without sore throat. The eruption does not appear before the second or third day—first on the forehead and face—is in patches, and of dull red color; and the skin has a roughened feel to the touch.

Mothers can do more than all others to prevent the spread of the disease, because they see the first symptoms and can promptly send the child to bed and isolate it until the true nature of the disease is determined. This early action, a hot bath, and a few days' rest and quiet will promote the safety and recovery of the sick, and also the safety of the other children of the family. In no one of the contagious diseases can the mother give greater aid, and in none is her co-operation more desirable.

WHOOPIING COUGH

Whooping Cough is a contagious disease. School children affected with it must be excluded from the schools until entire recovery, and should be isolated from all other children. The premises must be placarded as provided in Rule 2.

CHICKEN POX

This disease, in itself, is comparatively free from danger, but within the last few years Smallpox has so frequently been diagnosed as Chicken Pox and such serious results have followed that the safety of the public health demands that if diagnosed as Chicken Pox it shall be placarded.

as such and the children kept from the schools and other places of public resort until complete recovery shall have ensued, and the premises disinfected.

TYPHOID FEVER

It is the opinion of the best and most experienced sanitarians that Typhoid Fever is a disease which need not exist. That it is the result of a specific germ. That it is a filth disease—not that it is alone produced by filth. There must be a specific germ, and this germ must, through the mouth, as food or drink, enter the small intestines, where it multiplies enormously, and is thrown off in the excreta, to again multiply under the favoring conditions of moisture and heat. Hence the disposal of the excreta of a Typhoid Fever patient is of the highest importance. The most dangerous source of infection is from water. The discharges are thrown into a privy vault, on a manure pile, or on the ground, whence they sink into the earth through the soil, and often contaminate neighboring wells.

There are many other ways in which water may be contaminated. The soiled clothing of a patient is washed and the water thrown upon the earth near a well, or poured into a leaky drain. Some kinds of food are very absorbent of disease germs. The most notable is milk, which becomes contaminated by being kept too near a patient. Several instances are known where milkmen have carried the germs of this disease in milk kept where the sick were, or by rinsing their cans with contaminated water.

The disease is not considered contagious in the sense that Smallpox, Measles, Scarlet Fever, and Diphtheria are, yet it has been practically demonstrated that the germs may enter the system through the respiratory tract, as sewer air. Attendants upon these sick are not in danger from contracting the disease directly from the patient. It goes through families because every individual, usually, has been exposed to the producing cause,—the disease germs,—first through contaminated water or food, then the house surroundings.

Protect the water supply from any possible source of contamination. The water supply of cities and towns should be procured from sources where there can be no contamination, immediate or remote, from privies, cesspools, stables or cemeteries.

Great care should be had to prevent the contamination of the water supply by discharges from the bowels of a person sick with Typhoid Fever, as by drainage into wells, springs, streams or other water supply, from a privy vault, sewer, drain or cemetery. Privies often drain into wells, unsuspected by those who use the water. Should Typhoid discharges pass into such a privy an outbreak of Typhoid Fever among those using the water from a neighboring well would be likely to occur. If such a well were the source of the general water supply of a city, Typhoid Fever might soon be epidemic there.

There is a good reason to suspect the water of a well whenever a vault is situated within less than a hundred feet of it, particularly if the soil be porous. In numerous instances fluids from excreta have leached into wells

from much greater distances; and it has been proved that a well thirty rods from a cemetery received water which had filtered through the soil of the cemetery.

The use of water from a source likely to be infected with excreta from a Typhoid Fever patient should be promptly stopped. Great care should also be given to the milk supply.

Dangerously contaminated water may be, and often is, found to be clear and colorless, and to have no bad taste.

Keep the premises pure and clean as possible. Of all forms of filth none are so dangerous to house as the hole-in-the-ground privy and the sink-drains.

All discharges from the patient should be received in a vessel containing a pint or more of a solution of chloride of lime (six ounces of lime to one gallon of water), and kept covered three or four hours, and then buried in the earth, at such distance from wells, springs, or streams that they cannot possibly be drained therein. NEVER MINGLE THEM WITH ANY KIND OF FILTH, IN A PRIVY OR ELSEWHERE.

All soiled clothing and bedding soiled with the discharges from the patient should be at once removed and placed in a tub and completely covered with solution of chloride of lime or other reliable disinfectant, and kept there until they can be boiled, or put in boiling water as soon as removed from the patient. It is important this should be closely observed, otherwise the substance on the clothing dries, becomes dust, floats in the air and endangers the attendants. It is probable that in this way washer-women often become infected and have Typhoid Fever. After this disinfection the clothing may be washed with safety.

During sickness, disinfect at once carefully any spots on floor, carpet or rug accidentally soiled.

There is no necessity of burning the clothing, bedding and bed of a Typhoid Fever patient even when death occurs, nor for a private funeral, but the coffin must not be opened in any church, hall, place of public assembly or residence.

Strict isolation of the sick is not necessary, but it is wise, for all who can properly do so to keep away.

After death or recovery, disinfect the sick room with sulphur fumigation and then wash the floors and woodwork with solution of corrosive sublimate or carbolic acid.

Nurses and others in the family should eat nothing in the room where the patient is, nor of anything that has been there. The food for the family and attendants should be prepared and kept as far as possible from the sick. As boiling will kill all disease germs, it is safer when the disease is in a house, to boil all water and milk just before using.

PUERPERAL FEVER

Puerperal Fever is a fearfully fatal disease. Hence, every attendant upon cases of labor should, by the use of antiseptic measures, sedulously guard against the occurrence of the disease. The hands and all instruments and appliances should be thoroughly disinfected, and all discharges

subject to decomposition, and capable of producing septicaemia, should be promptly removed and destroyed. The only way to avoid this terrible disease is for every practitioner to recognize his personal responsibility in the matter, and he who does not is guilty of criminal negligence.

LEPROSY

Persons afflicted with well developed Leprosy should be required by all local Health Boards to remain on their own premises, and should not be permitted to mingle with the general public.

TUBERCULOSIS—CONSUMPTION

This is an infectious and therefore a communicable disease, due to a germ—the *Bacillus Tuberculosis*. The disease is propagated and disseminated by infected meat and milk, and especially by the excretions and sputum of persons affected by it.

INFECTION.—It has been shown that the expired air is not infective. Cornet has said, "The consumptive, in himself, is almost harmless, and only becomes harmful through bad habits". The virus is largely contained in the sputum, which, when dry, is disseminated in the form of dust, and constitutes the great medium for the transmission of the disease. In the last stages of Consumption, the patient is weak, the sputum is expelled improperly; pillows, sheets, handkerchiefs, etc., are soiled. If a male, the beard or mustache is smeared. Even in the hands of the cleanly, without especial precautions, such circumstances all tend to the production, around the patient, of a halo of infected dust; maintained by every process of bed making or cleaning, which includes the pernicious habit of "dusting". In the hands of the careless and dirty, the infectivity is, of course, greatly aggravated.

It attains its maximum of intensity where the filthy habit of spitting on the floor prevails, especially if it is carpeted.

All rooms frequented by persons suffering from Tuberculosis very soon become infected, and consequently dangerous, such as hospitals, jails, poor-houses, etc.; all such rooms where ventilation and disinfection are neglected are very dangerous, as proven by the great number of deaths of those who are confined in these poisoned abodes. Boats and cars on our great lines of travel, without great care being used, become veritable pest houses.

MEANS OF PREVENTION.—*Sunlight* is one of the most powerful agents in destroying the tubercle bacilli. Avoid imperfectly ventilated dwellings, dark, damp, musty rooms. Let your dwellings be light, dry and well ventilated, with an abundance of sunlight. The *sputum* should always be kept moist. In all public places, spittoons, partly filled with water, to which may be added some disinfectant, such as carbolic acid, or a two-per cent solution of formaldehyde, should be freely distributed, and which all persons who spit should be required to use, if necessary.

Spitting in the streets and in all public places should be prohibited. No child should even be allowed to sleep with a person suffering from Tuberculosis, especially if of the pulmonary variety.

Persons suffering from Tuberculosis should not drink out of the same cup used by other members of the family, and when traveling should carry his own cup, as the microbes will adhere to the cup in great numbers, and thus endanger others.

As most cities obtain their *water supply* from rivers, whose waters are contaminated with sewage, all water for drinking purposes should be boiled before using, thus preventing Typhoid Fever, as well as Tuberculosis. All *soiled clothing* from Tuberculosis patients should be thrown into a tub of water, to which some disinfectant has been added, preventing the *sputum* from drying, and thus protecting the washerwoman, as well as all others exposed.

Quarantining those affected, and placarding the premises, are not required in this disease; nor are public funerals prohibited. The presence of this disease should always be reported to the proper health officer in order that instruction may be given to the patient and relatives as to the cause of the disease and the best means of preventing its further spread.

THE DEAD

RULE 24. A body dead from Smallpox must be immediately wrapped in a cloth saturated with the strongest disinfectant solution, without previous washing, and cremated or buried deep, and nobody dead from this disease shall under any circumstances, or any lapse of time, be disinterred.

RULE 25. The body of a person who has died from Asiatic Cholera, Yellow Fever, Leprosy, Diphtheria (Membranous Croup), Scarlet Fever (Scarlatina or Scarlet Rash), must not be removed from the sick room until it has been wrapped in a cloth saturated with a solution of Corrosive Sublimate (one ounce to six gallons of water), and then tightly enclosed in a coffin. The body shall then be cremated or buried immediately without the attendance of any person other than is necessary for the interment thereof, provided that bodies dead from Diphtheria, Scarlet Fever and Puerperal Fever, if prepared in accordance with the rules adopted by this Board for the transportation of corpses by embalmers holding a license as such from the State Board of Health, may be deposited in a vault or be shipped by a public conveyance.

RULE 26. No public funeral (1) shall be held of any person who has died from either of said diseases named in Rules 24 and 25 and no public funeral shall be held in a house, nor on any premises where there is a case of, nor where a death has recently occurred from either of said diseases.

RULE 27. No person, company, corporation or association having charge of or control of any school house or church, or of any building, room or place used for school or church purposes, or for any public assembly, shall permit the body of any person dead from any contagious or infectious diseases named in these regulations, or any other dangerous contagious disease, except Typhoid Fever and Tuberculosis, to be taken into such school house, church, building, room or place, for the purpose of holding funeral service over such body; and no sexton, undertaker or

other person having charge of or direction of the burial of any body dead from any of the said diseases, shall permit the coffin or casket containing such body to be opened; nor shall any child be permitted to act as pallbearer or carrier at such funeral.

BURIALS

RULE 28. Upon the death of any person within the limits of a city, town or township, it shall be the duty of the undertaker, or other person superintending the burial of said decedent to procure from the physician in attendance at the time of death, or of the coroner when the case comes under his jurisdiction, a certificate setting forth the full name, age, sex, color, place of death, date and cause of death, and such other facts as may be required by regulations of the State Board of Health and the Statutes of the State of Iowa. If any person shall die without a physician in attendance, it shall be the duty of the undertaker, or of any person acquainted with the facts, to report the same to the registrar of the local Board of Health, who is hereby authorized to give a certificate of death as aforesaid, *provided*, it be not a case requiring the attendance of a coroner.

RULE 29. No sexton or other person or persons, having charge or control of any cemetery, burying place, or tomb or vault, and no undertaker, or other person or persons, shall inter, entomb, or place in any vault, the dead body of any person, or remove such body from or out of any city, town or township without having procured a certificate of death as provided in Rule 28; and it shall be the duty of any undertaker, or other person or persons having charge of the burial or removal of the dead body of any person to deliver said certificate of death forthwith to the registrar, sub registrar or deputy of the city, town or township in which the death occurred.

RULE 30. It shall be the duty of such registrar, sub registrar or deputy, upon the presentation of a certificate of death, —V. S. D., properly filled out—to issue a permit (V. S. X.) to inter, entomb, or place in a vault the body of the deceased person named in such certificate, or to issue a removal permit in case the body is not to be interred in the city, town or township in which the death occurred. *Provided*, a body dead from Smallpox, Asiatic Cholera, Leprosy, Yellow Fever, Typhus Fever or Bubonic Plague, shall not be deposited in a receiving vault.

RULE 31. If any physician, or other person, shall knowingly attempt to secrete, or withhold the true character of any of the contagious or infectious diseases specified in these regulations, or shall in any manner whatsoever attempt to deceive or defraud, or who shall make any false statement in making a certificate of cause of death by giving any other than the true cause of such death; or, if the decedent was affected with any such contagious or infectious disease during his last sickness, he shall neglect or refuse to state such fact in such certificate, he shall be liable to the penalty prescribed in section 2573 of the Code.

(1)A "public funeral" is deemed to be the indiscriminate attendance of persons not immediately connected with the family of the deceased person, especially children; the carrying of a dead body to a church or other

public building; or exposure thereof to the public at any place, preceding or during the funeral service. In other words there must be none present except those absolutely necessary to prepare the body for interment or to inter it.

RULE 32. Upon the presentation of the proper certificate in accordance with section 3, chapter 100, Acts 30th General Assembly, for the removal of a dead person from the town or township in which the death occurred, it shall be the duty of the registrar of the local Board of Health of the town or township where such death occurred to issue a permit for such removal. *Provided*, that where said body is to be disinterred such permit must be accompanied with a disinterment permit from the State Board of Health, but no permit for such removal, from one State Province or District to another, shall be granted in any case of a body dead from Smallpox or Bubonic Plague, or from any sequelae or complications of said diseases. Bodies dead from infectious diseases may be disinterred only upon a special permit issued by the State Board of Health.

DISINFECTION

As a result of patient and prolonged investigation two simple means have been determined upon which, if faithfully carried out, would soon rid the world of infections and contagions, which, if not checked, become epidemic in character and frightful in mortality. These "means" are QUARANTINE, or isolation of the sick and their nurses, and thorough DISINFECTION—"the former means to let the matured disease die out, and the latter to kill the new germs before they can develop fresh mischief". To these means should be added in the case of Smallpox and perhaps some other of the communicable diseases, vaccination or inoculation.

It is important, first, to know what parts of the body are the favorite breeding places of the germs or micro-organisms that are the cause of infectious diseases and what parts give them off most freely.

As a result of observation and experiment it has been found that—In Cholera they are most numerous in the discharge from the bowels. Consumption, in the expectoration from the lungs.

Diphtheria (Membranous Croup), in discharges from mouth, throat and nose.

Measles, in the air passages and skin.

Puerperal Fever, in the discharges of the reproductive organs.

Scarlet Fever, in the discharges from mouth, throat and nose, and particles from the skin.

Smallpox and Varioloid, in the pustules of the body.

Typhoid Fever, in the discharges from the bowels and urine.

Whooping Cough, in the air passages.

From these sources they get into our body by means of the food we eat, the water we drink, the air we breathe, or through broken surfaces of the skin and mucous membranes. Many of these germs are very resistant to lethal influences, and under favoring conditions multiply with wonderful rapidity.

Freezing or drying destroys but few of them—boiling or burning kills them all.

It is important, as well as interesting also, to know, at least approximately, how long the infection lasts in given cases. The following shows the average period of such infection:

Cholera, until complete recovery from vomiting and purging.
Consumption, as long as the tubercular bacilli are found in the sputa.
Diphtheria, usually about three weeks after the nose and throat are well. The length of time that bacteria remain should be determined by a bacteriological examination—made at the laboratory of this Board, as explained elsewhere in this circular.

Measles, from three days before eruption until scurfiness has gone—two to four weeks.

Scarlet Fever, from five to six weeks, until the throat is well and desquamation (peeling off) has ceased.

Smallpox, from four to eight weeks, until all the scabs have fallen off.
Typhoid Fever, from five to seven weeks, until the fever has disappeared and the diarrhoea relieved. (Often much longer.)

Whooping Cough, until the "whoop" is gone—from four to six weeks.
The following illustrate some of the best known and most reliable methods of caring for those sick with infectious diseases and of destroying the disease-producing germs:

CLEANLINESS

A careful inspection of the premises, inside and out, should be made, including the cellar, well, outhouses, not only with a view of ascertaining the breeding places of the disease germs, but for the purpose of destroying everything that is a menace to health. Cleanliness of dwellings, closets, cupboards, privies, alleys, person, clothing, and bedding should be enjoined and enforced. Carpets, dirty and dust-laden, and successive layers of paper on the walls—especially when partially detached, form most excellent receptacles for preservation of these disease germs.

DISINFECTION

Disinfection is based upon the fact that all these communicable diseases are caused by a micro-organism—specific in character, whose multiplication and vitality are dependent upon favoring conditions, that can be successfully combated by agents denominated *disinfectants*. The terms "antiseptics", "deodorants" and "disinfectants" are, by many, thought to express the same thing. They are widely different.

A *DEODORANT* has the power of removing offensive odors, but may have no disinfectant powers whatever, and, *vice versa*, the disinfectant may have no deodorizing power. Therefore, the removal of an offensive odor by means of a deodorant does not remove the danger from disease germs already present. An offensive odor may exist without the presence of disease-producing germs, and, *vice versa*, a most dangerous infection may exist without any odor.

AN *ANTISEPTIC* is an agent which retards, prevents or arrests putrefaction, decay or fermentation. It may also arrest the development of the germs of disease, and may be used as a preventive of such diseases but it does not not destroy the life of disease germs and hence cannot be relied upon when such germs are present.

The terms *Aseptic* and *Sterile* have reference to a condition denoting the absence of bacteria:

A *DISINFECTANT* or *GERMICIDE* is an agent which has the power of destroying germ life.

The term *Sterilization* is practically synonymous with the term *Disinfection*—both have reference to the destruction of germs. A distinction is often made by saying that *Sterilization* means the destruction of germs by *heat* whereas *Disinfection* refers to their destruction by chemical agents.

The following is a list of the most useful disinfectants:

I—FIRE

Complete destruction of every infected thing of little value such as rags, cheap books, etc.

II—STEAM

Under pressure, superheated, temperature 240 degrees F. Exposure to this for ten minutes will destroy all germs. Ordinary steam at 212 degrees F. will not penetrate sufficiently. Pressure is required to secure penetration. Every well regulated local health department should have ample facilities for the application of "steam" and "dry heat", where all infected articles suitable for such methods of infection that are too valuable to be destroyed should be officially disinfected. For this service a small fee might be charged.

III—DRY HEAT

Baking in an oven at temperature of 230 degrees F. for two hours. Greater heat than this is liable to destroy the texture of most articles.

IV—BOILING IN WATER

Actively for half an hour. This will destroy all known germs of disease.

V—FRESH CHLORIDE OF LIME

Six ounces to one gallon of soft water. Specially useful for faeces, urine and sputa.

VI—CORROSIVE SUBLIMATE

(Bichloride of Mercury.) This is a powerful poison. A solution of 1 to 1000 (60 grains to one gallon of water) will kill all of the disease-producing bacteria in 15 minutes when brought in direct contact with them (except the anthrax bacillus, a germ now seldom encountered). When much organic matter is present a solution of double the above strength should be used. The solution should always be freshly prepared. It should be prepared in glass, earthen or wooden vessels (not in metal vessels) and is not to be used in disinfecting metal articles. Being very poisonous it is best to color the solution with some dye so that it can not be mistaken for water.

VII—CARBOLIC ACID (AND LYSOL AND CREOLIN)

A five per cent solution of carbolic acid (carbolic acid, half pint; water, five quarts) is very useful as a general disinfecting agent and especially valuable for sputum. When used for washing face and hands only a two and one-half per cent solution of carbolic acid should be used. Great care should be taken that the pure acid does not come in contact with the skin, as it is very corrosive. (If such does happen alcohol should be immediately applied.) Lysol and creolin are strong disinfectants and are used in the same strength as carbolic acid. They have the advantage in that they are non-corrosive.

VIII—COPPER SULPHATE (BLUE VITROL)

This substance is very cheap and very efficient, especially for the disinfection of discharges from the bowels and bladder. It is used in a 5 per cent solution.

IX—SULPHUR FUMES (SULPHUROUS GAS)

This gas is produced by burning sulphur, is a fairly efficient germicide under certain definite conditions, namely: That all the germs should be freely exposed to the gas in a tightly closed room for at least eight hours; that the air of the room should be moist and that the amount of gas should be that generated by burning at least four pounds of sulphur for every 1000 cubic feet of air space.

X—FORMALDEHYDE

Formaldehyde is a gas. Formalin is a commercial preparation which represents a 40 per cent (or concentrated) solution of formaldehyde in water. A two per cent solution is a good deodorant and a five per cent solution a very efficient disinfectant. Formaldehyde gas is the best agent known for general fumigation. At least 12 ounces of the 40 per cent solution should be used for every 1000 cubic feet. It should be evaporated as rapidly as possible and the temperature of the room should be at least 70 degrees F.

The proprietary disinfectants which are so often widely advertised and whose composition is kept secret are relatively expensive and often unreliable and inefficient.

SPECIAL RULES

The following rules for the use of disinfectants are recommended.

RULE 1. *Precautions to be taken when removing a patient suffering from a contagious disease.* Remove all clothing, linen, covering or other effects of the patient, and replace them by others which have not been used since the beginning of his illness or which have not remained in the room in which he has been isolated, unless, however, such clothing, linen, coverings or other effects, after having been used by the patient or having remained in his room, have been disinfected in the manner described in Rule 4. Provide the patient with rags for receiving his excretions or evacuations during the transport, and burn these rags or

disinfect them according to one of the three methods described in Rule 4.

RULE 2. *Disinfection of a house or apartment, and of the furniture and effects contained therein.* Of the following three methods given, the first is recommended as being by far the best method.

First Method. By the use of Formaldehyde gas. In order to obtain desired results the following directions must be closely observed and practiced:

(1) All cracks or openings in the plaster or in the floor or about the doors and windows should be caulked tight with cotton or with strips of cloth.

(2) The linen, quilts, blankets, carpets, etc., should be stretched out on a line, in order to expose as much surface to the disinfectant as possible. They should not be thrown into a heap. Books should be suspended by their covers so that their pages are all open and freely exposed.

(3) The walls and floors of the room and the articles contained in it should be thoroughly sprayed with water. If masses of water or sputum are dried down on the floor they should be soaked with water and loosened. No vessel of water should, however, be allowed to remain in the room.

(4) Twelve ounces of the commercial 40 per cent formaldehyde solution for each one thousand cubic feet of space to be disinfected should be used. This solution should be rapidly vaporized, or distilled into the room, by the use of one of the many forms of apparatus now on the market.

(5) The apparatus used for carrying out these instructions must be approved by this Board, upon the recommendation of its bacteriologist.

(6) Fumigation may also be done by the use of a formalin spray or by dipping sheets, etc., in a solution of formalin and hanging them about the room. If either of these last named methods is used, double the amount of formalin mentioned above (4) should be used and this mixed with equal parts of water.

(7) If the formaldehyde gas is rapidly generated the room should remain closed for at least twelve hours; if slowly, twenty-four hours.

(8) The temperature of the room during the process of fumigation should be at least as high as 70 degrees F.,—the higher the more efficient the fumigation.

(9) After fumigation has been completed, all doors and windows should be thrown open. To hasten the removal of the formaldehyde gas, a dish with ammonia in it may be placed in the room.

Second Method. By the use of Sulphurous acid gas by the burning of Sulphur. It is not as efficient a method of fumigation as by the use of formaldehyde gas. At least four pounds of sulphur should be used for every 1000 cubic feet of space.

To insure the combustion of the sulphur, and as a precaution against fire, place the sulphur in an iron pan, which should be placed upon a couple of bricks or stones, resting in a larger vessel, which is partly filled with water. In order to insure the ignition of the sulphur, the surface

should be well moistened with alcohol before applying the light. Several twisted strips of newspapers imbedded in the sulphur and projecting above the surface and ignited at their ends will answer the same purpose.

After the room has been subjected to the sulphur fumes twenty-four hours, throw open all doors and windows and air the house well, after which sponge all exposed surfaces with a solution of carbolic acid, two ounces in each gallon of water, and give a final scrubbing with soap and hot water.

Third Method. This method is recommended only when the process of general fumigation cannot well be carried out.

Remove all the effects, furniture and articles contained in the premises in order to disinfect them in the manner described in Rule 4, then thoroughly wash the walls, ceilings and floors with a solution of bi-chloride of mercury; one drachm to a gallon of water.

RULE 3. *Disinfection of a vehicle or boat used in the removal of a patient, or the body of a patient who has died of a contagious disease.*—*First Method:* Remove all cushions, curtains and other accessories and disinfect them according to one of the methods described in Rule 4, then wash out the vehicle or boat with a solution of bi-chloride of mercury, two drachms to one gallon of water. *Second Method:* Put the vehicle in a closed-in place and fumigate with formaldehyde or sulphur as described in Rule 2. Wrap the body in a well-sewed sheet completely saturated with one of the following solutions: (1) Bi-chloride of mercury; two drachms to one gallon of water. (2) Carbolic acid; four ounces to one gallon of water. (3) Chloride of lime; six ounces to one gallon of water.

RULE 4. *Disinfection of everything taken out from the room where the contagious patient is isolated.*—*Food:* Burn the remains of the food which has been served to the patient, or sprinkle them with a solution of carbolic acid, bi-chloride of mercury, or with chloride of lime and bury them.

Vessels and utensils: Wash them in boiling water.

Clothing, sheets, napkins, coverings and other linen: (1) Burn them, if of little value; or, (2) Boil them in water for at least half an hour; or, (3) Steep them for four hours in a solution of one drachm of bi-chloride of mercury to one-gallon of water; or, (4) Steep them for four hours in a solution of three ounces of carbolic acid to one gallon of water.

Furniture, mattresses and articles which might be injured by the foregoing methods of disinfection: (1) Expose them for ten minutes to a current of steam in a suitable apparatus; or, (2) Expose them for two hours to a dry heat at a temperature of 230 degrees Fahrenheit; or, (3) If neither of the two preceding methods can be employed, put them in a well closed room and expose to the fumes of formaldehyde; or of sulphur as described in Rule 2 of General Rules.

Expectoration and evacuations: Collect them in vessels and mix with them, three times their quantity of one of the following disinfectants, to be left in contact with them for half an hour: (1) Bi-chloride of mercury, two drachms to one gallon of water. (2) Carbolic acid, six ounces to one gallon of water. (3) Powdered chloride of lime. (4) Chloride

of lime, six ounces to one gallon of water. (5) Lime milk prepared as follows: Sprinkle gradually lime of good quality with one-half its weight of water; dilute the powder so obtained with twice its volume of water. (a). (6) Copper sulphate, 5 per cent solution.

RULE 5. *Disinfection of persons and effects before leaving a house which has been quarantined.*—Wash, at least, the uncovered portions of the body, the hair and beard, with a solution of carbolic acid in the proportion of a tablespoonful to one gallon of water.

Completely change clothing, and put on other which has not remained in the infected house, or, if it has remained there, which has been disinfecting in the manner described in Rule 4.

RULE 6. *Disinfection of the patient and his effects after his recovery.*—Wash the body with a solution of one tablespoonful of carbolic acid to one gallon of water.

Disinfect as described in Rule 4 all clothing and other articles used by him since a period of fifteen days before the beginning of his illness.

RULE 7. *Disinfection of a stable, enclosure, litters, excrements, blood and other contaminated liquids.* *Stable:* First method: Close all outlets, then fumigate with formaldehyde; or sulphur, as described in Rule 2.

Second method: Wash the walls, ceilings and floors with a solution of bi-chloride of mercury, two drachms to one gallon of water.

Third method: Whitewash with lime the walls, ceilings and floors.

Enclosure: Remove the dirt to a depth of three inches and bury it at least a foot deep.

Whitewash with lime the walls of the enclosure.

Litter, excrements, blood and other liquids from the sick animal: Burn them or bury them a foot deep, at least, after covering them with quick lime.

(a) Lime-milk keeps only for a few days, and only when the vessel containing it is kept carefully closed.

RULE 8. *To disinfect a privy.*—Almost impossible to do it if full. Empty it.

1. Corrosive sublimate, two drachms to one gallon of water.
2. Carbolic acid, four ounces to one gallon of water.
3. Sulphate of copper (bluestone), four ounces to one gallon of water.
4. Chlorinated lime, one-half pound to one gallon of water.
5. Fresh slaked lime to cover the contents.
6. A two per cent solution of formaldehyde.

Whichever is used must be used in large quantities and added frequently.

In preparing any disinfectant solution, always use soft water, because the chemical constituents of hard water injure the solution. Always use a wooden or earthen vessel for any solution of corrosive sublimate.

Disinfection should be done *thoroughly* or it is useless.

CONTAGIOUS DISEASES IN OUR PUBLIC AND PRIVATE SCHOOLS

OFFICE OF THE STATE BOARD OF HEALTH, {
Des Moines

At a meeting of the Iowa State Board of Health, held November 5th and 6th, 1902, the following rules were adopted for the restriction and prevention of contagious diseases in the public and private schools of this state, pursuant to authority vested by Sections 2565 and 2572 of the Code, and the same are binding upon boards of health, school boards, teachers, and all persons throughout the State.

By order of the Board,

A. M. LINN,
President.

J. F. KENNEDY,
Secretary.

RULES

RULE 1. Every person entering any public or private school of Iowa must give satisfactory evidence of protection by vaccination.*

RULE 2. The fact of vaccination and protection must be entered with each name on the school record, and on transfer and promotion lists.

ORDER OF VACCINATION—At a meeting of the State Board of Health, February 2, 1894, for the purpose of preserving and improving the public health and of preventing the spread of the disease known as smallpox, the following rules and regulations were adopted:

First—All persons in this State over the age of one year, who have not been vaccinated, or who in the opinion of the local board of health of the district or jurisdiction in which such persons reside or are found, do not furnish satisfactory evidence of protection from smallpox, are hereby ordered to be vaccinated.

Second—Local boards of health and all officers who compose said boards, and all sheriffs, constables, city marshals and police officers within their respective jurisdictions, are hereby directed to enforce the foregoing order as soon as practicable, and so far as said order shall apply to the pupils of any public or private school or to the teachers thereof. The officers of the school district in which such school is held shall also require its enforcement. (See Section 2572—The Code.

RULE 3. Persons affected with diphtheria (membranous croup), measles, mumps, rotheln, scarlet fever (scarlatina, scarlet rash), whooping cough, smallpox, Asiatic cholera, typhoid fever, or leprosy.

*The following is the definition of vaccination as adopted by the Iowa State Board of Health, November 6, 1902: An inoculation by scarification, puncture or injection beneath the epidermis, of a vaccine which produces, with some constitutional disturbance, the typical vaccine vesicle, which leaves, after the pock has healed, its characteristic scar.

must be excluded from school until, upon a certificate from the attending physician, showing complete recovery, thorough disinfection of his or her person and clothing, and the disinfection of the home, the mayor or township clerk, as the case may be, issues a written permit for their readmission, after the quarantine rules of this Board have been first complied with. All other persons from families where such diseases exist shall also be excluded from the schools until they are furnished with a permit as above required.

RULE 4. Every school teacher who discovers among his or her pupils a case of these contagious diseases, must immediately report the fact to the mayor or township clerk, as the case may be; also, to the superintendent or principal of the school, and to the parents of the children, and must send the pupils thus afflicted to their homes at once. Teachers must not visit premises wherein are children sick with any contagious disease, and must carefully avoid exposure to such diseases.

RULE 5. If a person is ascertained to have attended school when affected with either of these contagious diseases, the local board of health shall immediately close the room wherein such person attended until it has been properly disinfected.

In case of an outbreak of smallpox in any community, or a threatened outbreak, every child attending the schools and every teacher must be examined relative to having been successfully vaccinated, and if they have not been vaccinated they must be excluded from the schools until so protected. This vaccination should include the community generally, as far as possible.

RULE 6*. Whenever any principal or superintendent of any school or any county superintendent in any county or any health officer in the State of Iowa shall have reason to believe that any superintendent, principal, teacher, pupil or employees in any school, public or private, in this State, is affected with tuberculosis, he shall so inform the health officer, whose duty it shall be to procure or cause to be procured by the family physician, a sample of the sputum or other discharge of such supposed infected person and to forward the same to the Laboratory of the State Board of Health at Iowa City for examination. Should such examination in the Laboratory reveal the presence of tubercular bacilli, any such superintendent, principal, teacher, pupil or employee, shall be excluded from the schools until such time as the Laboratory examination, made without expense, shall fail to reveal the presence of the tubercular bacilli.

The rule was submitted to the Attorney-General for an opinion as to the authority of the Board to enact and enforce such a rule.

The following is a copy of his reply.

Des Moines, Iowa, February 19, 1906.

DR. J. F. KENNEDY, Secretary State Board of Health:

Dear Sir.—I am in receipt of your favor of the 25th ultimo, asking me whether Rule 6, adopted by the State Board of Health, can be enforced under the provisions of Section 2572 of the Code. In answer

*Adopted January 16, 1906.

will say that, if tuberculosis is contagious, as I assume it is, I think it is within the power of the State Board of Health, under Section 2565 of the Code, to adopt the rule, and that the same can be enforced under the provisions of Section 2572 as amended.

I am,

Very truly yours,

(Signed) Charles W. Mullan.

Attorney General.

EARLY SYMPTOMS OF CERTAIN CONTAGIOUS DISEASES

SMALLPOX—This disease, though highly contagious, is comparatively rare, owing to the fact that vaccination is a safe preventive. Its early symptoms are so nearly similar to those of some other diseases that only an experienced physician can properly diagnose it. Vaccination and re-vaccination are better in this disease than rules for diagnosis or for restriction.

SCARLET FEVER—This disease is also called *scarlatina* and *scarlet rash*, both of which names are misleading, inasmuch as they are often used to express some harmless form of eruption. They are both accommodating terms for, and are identical with scarlet fever. The disease is often sudden in its attack. There are nausea; vomiting; hot, dry skin; full, rapid pulse; high temperature; headache; flushed face; whitish coated tongue, with little red projections through the coating; very fine rash in the roof of the mouth; sore throat and pain in swallowing. Rash usually appears within the first twenty-four hours, first about the neck and face, and thence extends over the entire body. It is light red, uniformly smooth, and is followed by a white line, or mark, if the finger is passed over it. These symptoms may not all be present, nor in the order named. The characteristic symptoms are: *Vomiting; high fever, setting in early; sore throat; whitish furred tongue; and appearance of fine rash within twenty-four hours.*

MEASLES—The onset of this disease is similar to what is commonly called a "cold in the head". Eyes watery and red; watery discharge from the nose; fever; hoarse, dry, husky and painful cough; and eruption in the roof of the mouth, with or without sore throat. The eruption does not appear before the second or third day—first in the forehead and face—is in patches and of a dull red color; and the skin has a roughened feel to the touch. The earliest initial symptoms are: *Watery eyes, sensitive to the light; discharge from the nostrils; sneezing; rough, dry cough, with pain under the breast bone; late appearance of the eruption, its occurring in patches, with interspersed spaces of healthy skin, and the roughened feel and swollen appearance of the skin.*

The Board does not require measles to be quarantined, but the premises must be placarded with the name of the disease, and no children from the family affected or the premises so placarded, shall be admitted to any school or other public place until all have recovered and the placard removed.

ROTTEIN, OR GERMAN MEASLES—This disease in its early symptoms occupies an intermediate place between scarlet fever and measles, without possessing the dangers of either. Hence it is better to mistake it for scarlet fever or measles and treat it as such than to mistake either measles or scarlet fever for rottein and treat them as such. It is highly contagious, and children so affected must be sent home, and only allowed to re-enter the school on a certificate, as required in Rule 3. It should be treated by isolation and disinfection. The common symptoms are sore throat; watery eyes and nostrils; slight fever; an eruption appearing early on the neck and upper part of chest, rapidly spreading over the body and soon subsiding. There is very little constitutional disturbance. Its characteristic symptoms are: *Moderate amount of fever; early appearance of a fine rash resembling the so-called "scarlet rash," with early disappearance of some; and more or less swelling of the glands of the neck.*

DIPHTHERIA—This disease is especially characterized by precursory symptoms. There is more or less languor; impaired appetite; slight fever and restlessness for some days before the throat symptoms manifest themselves; and if diphtheria is prevalent in a community a child manifesting such symptoms should receive prompt attention and should excite serious apprehensions. In addition to these premonitory symptoms, the pulse is rapid and rather feeble; the throat and soft palate are red and moderately swollen; there is pain on swallowing fluids rather more than solids; putrid breath and the appearance upon the tonsils of whitish or ash-colored spots, which rapidly coalesce and form a thick, leathery ash-colored membrane. If the air passages become involved, there is a croupous cough and breathing. The characteristic symptoms of diphtheria are: *Languor and debility; redness, soreness and swelling of the throat; fetid breath; ash-colored spots running together; rapid, feeble pulse; and croupous symptoms if there is extension of the membrane into the air passages.*

MEMBRANOUS CROUP so closely resembles diphtheria when the latter invades the air passages that the board has included it in the rules and regulations for the restriction and prevention of diphtheria.

WHOOPING COUGH—Whooping cough is an infectious disease. A pupil affected with it must be excluded from the schools until entire recovery. There is no necessity for quarantining the adult members of the family, or the premises, which should be placarded, and the children excluded from the schools and from public gatherings.

TYPHOID FEVER—This disease closely resembles diphtheria in the initial symptoms. There is languor, a tired feeling lasting many days; headache; wakefulness; frequent diarrhoea; tongue red, especially at tip and edges; tendency to bleeding at the nose; with fever, which gradually increases toward evening. There are no throat symptoms.

Typhoid fever is deemed to be the result of a special contagium present in the discharges of typhoid fever patients. The disease germ is multiplied after being thrown from the body, and finds its way into

the intestinal track through water or food. The patient should be isolated from the well and all discharges be thoroughly disinfected and buried. The premises need not be quarantined.

Upon the outbreak of typhoid fever, the teacher, especially in country districts where the local board of health is too often ignorant or neglectful of its duty, should suggest, and, so far as possible, insist upon a careful inquiry into the source and healthfulness of the water and milk supply. In nearly all such cases the drinking water or milk is found contaminated, and its early discovery may prevent many other cases occurring.

ISOLATION

Isolation means the complete exclusion of all other persons from the sick except the nurse and attending physician; that the nurse shall be restrained from going to and from the premises, or mingling with the family; that all well persons shall be prevented from contact with bedding, clothing, food or other articles that have been used on or about the sick. Where from necessity the parents or family are nurses, the isolation and quarantine applies to them.

SCHOOLS AND TEACHERS—When a contagious disease appears in a community the schools should not be closed unless the sick outnumber the well, and the school becomes decimated. By closing the schools the children are thrown together by intervisiting and play, and the risk of exposure thereby is greatly increased. By continuing the school and isolating the sick the danger of exposure is greatly decreased.

If a pupil is affected the teacher must immediately remove such pupil from the school, and unless the other children in the family go from home to live, they, also, must be excluded from the school. The exclusion of pupils is a part of the quarantine regulations, with which neither the attending physician, school directors, nor even health officers can interfere.

Should any pupil be attacked with any infectious disease in any schoolroom all the pupils in such room shall at once be dismissed and the schoolroom remain closed until thoroughly disinfected.

Any teacher so exposed must be thoroughly disinfected in person and clothing, and if boarding in a family wherein is a contagious disease he must immediately thereafter change his boarding place.

VACCINATION AND THE LAW

The following, in regard to the right of the State Board of Health to require, as a condition of attendance upon the schools of Iowa, satisfactory evidence of successful vaccination, will be of interest.

A local newspaper contained this item:

The question of compulsory vaccination has at last been carried into the courts and there decided. The circumstances are of interest. The local board of health of Shelby, in compliance with the directions of the State Board of Health, ordered all the scholars in the Shelby public schools to be vaccinated on or before January 1, 1895, or be excluded from the schools. About 250 children complied with the order

of the local board while the parents of some ten of the pupils put on war paint and refused to have their children vaccinated, whereupon they were duly sent home and forbidden to re-enter school until they should be vaccinated. Their parents carried it into the courts, suing out an injunction against the local board of health of the town of Shelby, and on last Saturday the local board and their opponents appeared in court at Harlan, before Judge Macy, who, after hearing the evidence sustained the local board of health of the town of Shelby.

This, we believe, is the first case in the state of Iowa, and the fight was made on the constitutionality of the regulations of the State Board of Health as having the power to exclude children from school who refuse to be vaccinated. This is a very important decision, and will tend to quiet those who are always ready to oppose good health regulations.

A request was made of Judge Macy for a copy of his opinion in the case above cited, to which he replied as follows:

HARLAN, IOWA, FEBRUARY 4, 1895.

Dr. J. F. Kennedy, Des Moines, Iowa.

MY DEAR SIR—Your letter at hand. I can only hurriedly answer. The opinion I rendered was oral, and I have not before me even the notes and citations I used. I have no doubt about the points involved. The legislature provided for the State Board of Health, and committed to it general powers with regard to health protection. That legislation does not contravene the principle of constitutional law that the right of authority of the legislature to pass or enact laws does not give that body authority to delegate the power to another body or branch of the government. The protection of health and morals of the citizens come within police regulation, and the State Board can enact rules and regulations upon the matter of preserving the public health, and if they are not oppressive, whimsical, discriminating, but reasonable and just, and apply to all, will be sustained.

N. W. MACY.

When the State Board of Health, in November, 1899, ordered general vaccination, and re-vaccination, when deemed necessary, Attorney-General Milton Remley furnished the Secretary the following, as his views from a legal stand-point of the right of the State Board to make such an order, and of the duty of local boards to enforce it:

It is claimed that compulsory vaccination is an invasion of the person of the individual. People submit to laws imposing burdens in the form of taxation and restraints upon their conduct or action with comparative equanimity, but when the enforcement of a law touches their person they are disposed to consider it a personal indignity. In such cases resentment and indignation often arise to the exclusion of reason and judgment. The power of the state to require all persons to be vaccinated, when the necessity therefor arises, is the same power

as that exercised when whole blocks of buildings are torn down or blown up to stop the spread of a conflagration. It is the same kind of power as that which arrests and confines an insane person, or one who, for any cause, is a menace to the others. It is called the police power of the state. "Public safety is the supreme law", is a maxim left us by the Romans. In times of danger to the public all things must yield to the demands of public welfare. No one having the small-pox would be permitted to parade the populous streets, spreading contagion everywhere. If under no statute law he could be restrained, he would be restrained by force; his life even would be taken, if necessary, under the law of self-protection or public safety, which is instinctively recognized by every human being.

The power to restrain one already infected with the disease, and the power to compel one to do an act which will prevent him from becoming infected, are one and the same—only differing in degrees.

The power of a state to require all persons to be vaccinated, when danger threatens, has not been directly determined by any court, to my knowledge, except in the case of *Morris vs. City of Columbus*, by the supreme court of Georgia, which was decided a little more than a year ago. The constitutionality of the law was upheld by the court in a very able opinion, in which the principles of the law are clearly stated, and the authorities are cited and reviewed. Other courts have upheld laws involving the same principle and powers, but space will not permit me to review them. It will pay anyone interested in the subject to read the *Morris* case. It is reported in 30 S. E. R., 850.

The state of Iowa has not authorized city councils to determine when the necessity arises for vaccination of the public generally, or the people of a city, as has the state of Georgia. Nor has it empowered school boards to require the vaccination of the pupils as have Pennsylvania and some other states. The duty of determining what is necessary to be done to preserve, to protect public health, and when it is to be done, has been intrusted by the legislature to the boards of health, state and local. From the necessities of the case such matters must be left to the local authorities to a large extent. It is competent for the legislature to clothe boards of health or town councils, or whatever agents may be selected, or by what name they may be called, with power to take whatever steps the emergency or conditions demand to protect the public health. The legislature of this state has given this power to the boards of health, and I am thoroughly convinced that every reasonable order made by the boards of health will be upheld by the courts, even to the extent of requiring all persons not immune, in a community threatened with the dread scourge, to be vaccinated. The reasonableness of any order depends, of course, upon the necessity for it, the proximity of the danger. Many considerations enter into the problem of what is reasonable. Care should, in all cases, be taken not to exceed the bounds of reasonableness. But when the necessity arises the matter should be taken hold of kindly, but with a firm hand and in a heroic manner, remembering that "*salus populi suprema est lex*".

XXI

RULES OF THE IOWA STATE BOARD OF HEALTH

AS PREVIOUSLY ADOPTED BY
THE AMERICAN PUBLIC HEALTH ASSOCIATION, THE AMERICAN
ASSOCIATION OF GENERAL BAGGAGE AGENTS, AND THE
NATIONAL CONFERENCE OF STATE AND PROVINCIAL
BOARDS OF HEALTH FOR THE TRANSPORTATION OF THE DEAD

THESE RULES APPLY EQUALLY TO ALL COMMON CARRIERS,
AND, HAVING BEEN DULY ADOPTED AND PROPERLY PUBLISHED, HAVE THE FULL FORCE OF LAW

RULE 1. The transportation of bodies dead of smallpox or bubonic plague from one state, territory, district or province to another, is absolutely prohibited.

RULE 2. The transportation of bodies dead of Asiatic cholera, yellow fever, typhus fever, diphtheria (membranous croup) scarlet fever (scarlatina scarlet rash), erysipelas, glanders, anthrax or leprosy shall not be accepted for transportation unless prepared for shipment by being thoroughly disinfected by (a) arterial and cavity injection with an approved disinfecting fluid; (b) disinfection and stopping of all orifices with absorbent cotton and (c) washing the body with the disinfectant all of which must be done by an embalmer holding a certificate as such issued by the state or provincial board of health or other state or provincial authority provided for by law.

After being disinfected as above, such body shall be enveloped in a layer of dry cotton, not less than one inch thick, completely wrapped in a sheet securely fastened and encased in an air-tight zinc, tin copper or lead-lined coffin or iron casket, all joints and seams hermetically sealed, and all enclosed in a strong, tight wooden box. Or the body being prepared for shipment by disinfecting and wrapping as above, may be placed in a strong coffin or casket and said coffin or casket encased in an air-tight zinc, copper or tin lined box, all joints and seams hermetically soldered.

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For interstate transportation under this rule only embalmers holding a license issued or approved by the state or provincial board of health, or other state or provincial authority provided for by law after examination shall be recognized as competent to prepare such bodies for shipment.

RULE 3. The bodies of those dead of typhoid fever, puerperal fever, tuberculosis, or measles, may be received for transportation when prepared for shipment by arterial and cavity injection with an approved disinfecting fluid, washing the exterior of the body with the same, and enveloping the entire body with a layer of cotton not less than one inch thick, and all wrapped in a sheet securely fastened and encased in an air-tight metallic coffin or casket, or air-tight metal-lined box, provided that this shall apply only to bodies which can reach their destination within thirty hours from the time of death. *In all other cases such bodies shall be prepared by a licensed embalmer holding a certificate as provided for in Rule 2. When prepared by a licensed embalmer as defined and directed in Rule 2, the air-tight sealing and bandaging with cotton may be dispensed with.*

RULE 4. The bodies of those dead from any cause not stated in Rules 2 and 3 may be received for transportation when encased in a sound coffin or casket and enclosed in a strong outside wooden box, provided they can reach their destination within thirty hours from the time of death. If the body cannot reach its destination within thirty hours from the time of death, it must be prepared for shipment by arterial and cavity injection with an approved disinfecting fluid, washing the exterior of the body with the same, and enveloping the entire body with a layer of dry cotton not less than one inch thick, and all wrapped in a sheet securely fastened, and encased in an air-tight metallic coffin or casket or an air-tight metal-lined box. *But when the body has been prepared for shipment by being thoroughly disinfected by a licensed embalmer, as defined and directed in Rule 2, the air-tight sealing and bandaging with cotton may be dispensed with.*

RULE 5. In the shipment of bodies dead from any disease named in Rule 2, such body must not be accompanied by persons or articles which have been exposed to the infection of the disease, unless certified by the health officer as having been properly disinfected.

Before selling tickets, agents should carefully examine the transit permit and note the name of the passenger in charge, and of any others proposing to accompany the body, and see that all necessary precautions have been taken to prevent the spread of the disease. The transit permit in such cases shall specifically state who is authorized by the health authorities to accompany the remains. In all cases where bodies are forwarded under Rule 2, notice must be sent by telegraph by the shipping embalmer to the health officer, or, when there is no health officer, to other competent authority at destination, advising the date and train on which the body may be expected.

RULE 6. Every dead body must be accompanied by a person in charge, who must be provided with a passage ticket and also present a full first-class ticket marked "Corpee" for the transportation of the body and a transit permit showing physician's or coroner's certificate, name of deceased, date and hour of death, age, place of death, cause of death, and all other items of the standard certificate of death recommended by the American Public Health Association and adopted by the United States Census Bureau, as far as obtainable, including health officer's or Registrar's permit for removal, whether a communicable or non-communicable disease, the point to which the body is to be shipped, and, when death is caused by any of the diseases specified in Rule 2, the names of those authorized by the health authorities to accompany the body. Also the undertaker's certificate as to how the body has been prepared for shipment. The transit permit must be made in duplicate, and the signature of physician or coroner, health officer, and undertaker, must be on both the original and duplicate copies. The undertaker's or registrar's certificate and paster of the original shall be detached from the transit permit and securely fastened on the end of the coffin box. All coffin boxes must be provided with at least four handles. The physician's certificate and transit permit shall be handed to the passenger in charge of the corpse. The whole duplicate copy shall be sent to the official in charge of the baggage department of the initial line, and by him to the secretary of the state or provincial board of health of the state or province from which said shipment is made.

RULE 7. When bodies are shipped by express, a transit permit, as described in Rule 6, must be made out in duplicate. The undertaker's certificate and paster of the original shall be detached from the transit permit and securely fastened on the coffin box. The physician's certificate and transit permit shall be attached to and accompany the express way-bill covering the remains, and be delivered with the body at the point of destination to the person to whom it is consigned. The whole duplicate copy shall be sent by the forwarding express agent to the secretary of the State or Provincial Board of Health of the State or Province from which said shipment was made.

RULE 8. Every disinterred body, dead from any disease or cause, shall be treated as infectious or dangerous to the public health, and shall not be accepted for transportation unless said removal has been approved by the state or provincial health authorities having jurisdiction where such body is disinterred, and the consent of the health authorities of the locality to which the corpse is consigned has first been obtained, and all such disinterred remains, or the coffin or casket containing the same, must be wrapped in a woolen blanket thoroughly saturated with a 1-1000 solution of corrosive sublimate, and enclosed in a hermetically soldered zinc, tin, or copperlined box. *But bodies deposited in receiving vaults shall not be treated and considered the same as buried bodies when originally prepared by a licensed embalmer as defined in Rule 2 and as directed in Rule 2 and 3 (according to the nature of the disease causing death), provided shipment takes place*

within thirty days from the time of death. The shipment of bodies prepared in the manner above directed by licensed embalmers from receiving vaults may be made within thirty days from time of death without having to obtain permission from the health authorities of the locality to which the body is consigned. After thirty days the casket or coffin box containing said body must be enclosed in a hermetically soldered box.

RULE 9. All rules and parts of rules conflicting with these rules are hereby repealed.

NOTE.—The parts of the above rules printed in italics can only be complied with by licensed embalmers. All other parts must be observed by all undertakers, whether licensed or not.

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