FOURTH BIENNIAL REPORT

OF THE

STATE BOARD OF HEALTH

OF THE

STATE OF IOWA,

FOR THE

FISCAL PERIOD ENDING JUNE 30, 1887.

DES MOINES:
GEO. E. ROBERTS, STATE PRINTER.
1887.

Resolved, That the Board is in nowise responsible for the sentiments and opinions entertained in the following papers, prepared by special request of the Board, the respective author of each paper being responsible for its contents.—*Resolution adopted by the Board and ordered printed in the Biennial Report.*

STATE OF IOWA,
OFFICE OF THE SECRETARY OF THE STATE BOARD OF HEALTH,
DES MOINES, July 1, 1887.

To WILLIAM LARRABEE, *Governor of Iowa:*

SIR—In accordance with the provisions of section 11, chapter 151, laws of Eighteenth General Assembly, the Fourth Biennial Report of the State Board of Health, for the fiscal period ending June 30, 1887, is herewith presented.

J. F. KENNEDY, M. D.,
Secretary.

MEMBERS OF THE BOARD.

	TERM EXPIRES.
P. W. LEWELLEN, Clarinda	January 31, 1892.
W. H. DICKINSON, Des Moines	January 31, 1889.
E. M. REYNOLDS, Centerville	January 31, 1894.
HENRY H. CLARK, McGregor	January 31, 1893.
S. B. OLNEY, Fort Dodge	January 31, 1890.
JAY D. MILLER, Ida Grove*	January 31, 1891.
JOHN C. SHRADER, Iowa City*	January 31, 1888.
JAMES L. LORING, Civil Engineer, Dallas Center	May 4, 1894.
A. J. BAKER, Attorney-General, *ex-officio*.	
M. STALKER, Ames, State Veterinary Surgeon, *ex-officio*.	

* To fill vacancy.

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STATE BOARD OF HEALTH.

[Chapter 151, Laws of '1880]

AN ACT to establish a State Board of Health in the State of Iowa, to provide for collecting vital statistics, and to assign certain duties to local boards of health, and to punish neglect of duties.

SECTION 1. *Be it enacted by the General Assembly of the State of Iowa*, That the Governor, with the approval of the executive council, shall appoint nine (9) persons, one of whom shall be the Attorney-General of the State (by virtue of his office), one a civil engineer, and seven (7) physicians, who shall constitute a State board of health. The persons so appointed shall hold their offices for seven (7) years; *provided*, that the term of office of the seven physicians first appointed shall be so arranged by lot that the term of one shall expire on the thirty-first (31st) day of January of each year; and that vacancies thus occasioned, as well as all other vacancies otherwise occurring, shall be filled by the Governor, with the approval of the executive council.

SEC. 2. The State board of health shall have the general supervision of the interests of the health and life of the citizens of the State. They shall have charge of all matters pertaining to quarantine; they shall supervise a State registration of marriages, births and deaths, as hereinafter provided; they shall have authority to make such rules and regulations and such sanitary investigations as they may from time to time deem necessary for the preservation or improvement of the public health; and it shall be the duty of all police officers, sheriffs, constables, and all other officers of the State, to enforce such rules and regulations, so far as the efficiency and success of the board may depend upon their official co-operation.

SEC. 3. The clerk of the district and circuit courts of each of the several counties in the State shall be required to keep separate books for the registration of the names and post-office address of physicians and midwives, for births, for marriages, and for deaths, which record shall show the names, date of birth, death or marriage; the names of parents and sex of the child when a birth; and when a death, shall give the age, sex and cause of death, with the date of the record and the name of the person furnishing the information. Said books shall always be open for inspection without fee; and the clerks of said courts shall be required to render a full and complete report of all births, marriages and deaths to the secretary of the board of health annually on the first day of October of each year, and at such other times as the board may direct. [For which service the clerk shall receive, in addition to the compensation already allowed him by law, the sum of ten

cents for each birth, marriage or death so recorded by him, and the further sum of ten cents for each one hundred words of written matter contained in said report, the same to be paid out of the county fund.]—*Chapter 140, Section 1, Laws 1882.*

SEC. 4. It shall be the duty of the board of health to prepare such forms for the record of births, marriages and deaths as they may deem proper; the said forms to be furnished by the secretary of said board to the clerks of the district and circuit courts of the several counties, whose duties it shall be to furnish them to such persons as are herein required to make reports.

SEC. 5. It shall be the duty of all physicians and midwives in this State to register their names and postoffice address with the clerk of the district and circuit courts of the county where they reside; and said physicians and midwives shall be required, under penalty of ten dollars ($10), to be recovered in any court of competent jurisdiction in the State at suit of the clerk of the court, to report to the clerk of the courts, within thirty (30) days from the date of their occurrence, all births and deaths which may come under their supervision, with a certificate of the cause of death, and such other facts as the board may require, in the blank forms furnished, as hereinafter provided.

SEC. 6. When any birth or death shall take place, no physician or midwife being in attendance, the same shall be reported by the parent to the clerk of the district and circuit courts within thirty days from the date of its occurrence, and if a death, the supposed cause of death, or, if there be no parent, by the nearest of kin not a minor; or, if none, by the resident householder where the birth or death shall have occurred, under penalty provided in the preceding section of this act. Clerks of the district and circuit courts shall annually, on the first day of October of each year, send to the secretary of the state board of health a statement of all births and deaths recorded in their offices for the year preceding said date, under a penalty of twenty-five dollars ($25) in case of failure.

SEC. 7. The coroners of the several counties shall report to the clerk of the courts all cases of death which may come under their supervision, with the cause or mode of death, etc., as per form furnished, under penalty as provided in section 5 of this act.

SEC. 8. All amounts recovered under the penalties of this act shall be appropriated to a special fund for carrying out the objects of this law.

SEC. 9. The first meeting of the board shall be within twenty days after its appointment, and thereafter in May and November of each year, and at such other times as the board shall deem expedient. The November meeting shall be in the city of Des Moines. A majority of the members of the board shall constitute a quorum. They shall choose one of their number to be President, and shall adopt rules and by-laws for their government, subject to the provisions of this act.

SEC. 10. They shall elect a secretary; who shall perform the duties prescribed by the board and by this act. He shall receive a salary, which shall be fixed by the board, not exceeding $1,200 per annum. He shall with the other members of the board, receive actual traveling and other necessary

expenses incurred in the performance of official duties; but no other member of the board shall receive a salary. The president of the board shall [monthly*] certify the amount due the secretary, and on presentation of said certificate the Auditor of State shall draw his warrant on the State Treasurer *of* (for) the amount.

SEC. 11. It shall be the duty of the board of health to make a biennial report, through their secretary or otherwise, in writing to the Governor of the State, on or before the first (1st) day of December of each year preceding that in which the General Assembly meets; and such report shall include so much of the proceedings of the board, such information concerning vital statistics, such knowledge respecting diseases, and such instruction on the subject of hygiene as may be thought useful by the board, for dissemination among the people, with such suggestions as to the legislative action as they may deem necessary.

SEC. 12. The sum of five thousand dollars ($5,000) per annum, or so much thereof as may be necessary, is hereby appropriated to pay the salary of the secretary, meet the contingent expenses of the office of secretary and the expenses of the board, and all costs of printing, which together shall not exceed the sum hereby appropriated. Said expenses shall be certified and paid in the same manner as the salary of the secretary. The Secretary of State shall provide rooms suitable for the meetings of the board and office room for the secretary of the board.

SEC. 13. The mayor and aldermen of each incorporated city, the mayor and council of any incorporated town or village in the State, or trustees of any township, shall have and exercise all the powers and perform all the duties of a board of health within the limits of the cities, towns and townships of which they are officers.

SEC. 14. Every local board of health shall appoint a competent physician to the board, who shall be the health officer within the jurisdiction and shall hold his office during the pleasure of the board. The clerks of the townships and the clerks and recorders of cities and towns, shall be clerks of the local boards. The local boards shall also regulate all fees and charges of persons employed by them in the execution of the health laws and their own regulations.

SEC. 15. It shall be the duty of the health physician of every incorporated town, and also the clerk of the local board of health in each city or incorporated town or village in the State, at least once a year to report to the State board of health their proceedings and such other facts required on blanks and in accordance with instructions received from said State board. They shall also make special report whenever required to do so by the State Board of health.

SEC. 16. Local boards of health shall make such regulations respecting nuisances, sources of filth and causes of sickness within their jurisdiction and on board any boats in their ports or harbors as they may judge necessary for the public health and safety; and if any person shall violate any such regulations he shall forfeit a sum of not less than twenty-five dollars

* As amended by Chapter 173, Acts of 20th G. A.

($25) for every day during which he knowingly violates or disregards said rules and regulations, to be recovered before any justice of the peace or other court of competent jurisdiction.

SEC. 17. The board of health of any city or incorporated town or village shall order the owner of any property, place or building (at his own expense) to move any nuisance, source of filth or cause of sickness found on private property, within twenty-four (24) hours, or such other time as is deemed reasonable after notice served as hereinafter provided; and if the owner or occupant neglects to do so, he shall forfeit a sum not exceeding twenty dollars ($20) for every day during which he knowingly and wilfully permits such nuisance or cause of sickness to remain after the time prescribed for the removal thereof.

SEC. 18. If the owner or occupant fails to comply with such order, the board may cause the nuisance, source of filth or cause of sickness to be removed, and all expenses incurred thereby shall be paid by the owner, occupant or other person who caused or permitted the same, if he has had actual notice from the board of health of the existence thereof, to be recovered by civil action in the name of the State before any court having jurisdiction.

SEC. 19. The board, when satisfied upon due examination that any cellar, room, tenement, or building in its town, occupied as a dwelling place has become by reason of the number of occupants, or want of cleanliness, or other cause, unfit for such purpose, and a cause of nuisance or sickness to the occupants or the public, may issue a notice in writing to such occupants, or any of them, requiring the premises to be put in a proper condition as to cleanliness, or, if they see fit, requiring the occupants to remove or quit the premises within such time as the board may deem reasonable. If the persons so notified, or any of them, neglect or refuse to comply with the terms of the notice, the board may cause the premises to be properly cleaned at the expense of the owners, or may remove the occupants forcibly, and close up the premises, and the same shall not again be occupied, as a dwelling place, without permission in writing of the board.

SEC. 20. Whenever the board of health shall think it necessary for the preservation of the lives or health of the inhabitants to enter a place, building or vessel in their township, for the purpose of examining into and and destroying, removing or preventing any nuisance, source of filth or cause of sickness, and shall be refused such entry, any member of the board may make complaint, under oath, to any justice of the peace of his county, whether such justice be a member of the board or not, stating the facts of the case, so far as he has knowledge thereof. Such justice shall thereupon issue a warrant, directed to the sheriff or any constable of the county, commanding him to take sufficient aid, and being accompanied by two or more members of said board of health, between the hours of sunrise and sunset, repair to the place where such nuisance, source of filth or cause of sickness complained of may be, and the same destroy, remove, or prevent, under the direction of such members of the board of health.

SEC. 21. When any person coming from abroad, or residing within any city, town or township within this State, shall be infected, or shall lately

have been infected with small-pox, or other sickness dangerous to the public health, the board of health of the city, town or township where said person may be, shall make effectual provision, in the manner in which they shall judge best, for the safety of the inhabitants, by removing such sick or infected person to a separate house, if it can be done without damage to his health, and by providing nurses and other assistance and supplies, which shall be charged to the person himself, his parents or other person who may be liable for his support, if able; otherwise at the expense of the county to which he belongs.

SEC. 22. If any infected person cannot be removed without damage to his health, the board of health shall make provision for him, as directed by the preceding section, in the house in which he may be, and in such case they may cause the persons in the neighborhood to be removed, and may take such other measures as may be deemed necessary for the safety of the inhabitants.

SEC. 23. Any justice of the peace, on application under oath showing cause therefor by a local board, or any member thereof, shall issue his warrant, under his hand, directed to the sheriff or any constable of the county, requiring him, under the direction of the board of health, to remove any person infected with contagious diseases, or to take possession of condemned houses and lodgings, and to provide nurses and attendants, and other necessaries for the care, safety and relief of the sick.

SEC. 24. Local boards of health shall meet for the transaction of business on the first Monday of May and the first Monday in November of each year, and at any other time that the necessities of the health of their respective jurisdictions may demand, and the clerk of each board shall transmit his annual report to the secretary of the State board of health within two weeks after the November meeting. Said report shall embrace a history of any epidemic disease which may have prevailed within his district. The failure of the clerk of the board to prepare, or cause to be prepared, and forward such report as above specified, shall be considered a misdemeanor, for which he shall be subject to a fine of not more than twenty-five dollars ($25).

SEC. 25. All laws in conflict with this act are hereby repealed.

GENERAL REPORT.

It would seem as if no argument were needed to prove that Boards of Health and sanitary legislation were beneficial to the State, and yet it is a fact that in the last, and in every General Assembly, there were some who were opposed to all legislation upon sanitary matters, and so expressed themselves to the writer; who favored the discontinuance of the State Board of Health, and with it the disbanding of the local Boards—for the reason that the law creating the State Board of Health provided for the expenditure annually, if necessary, of the sum of five thousand dollars! The law declares:

SEC. 2. The State Board of Health shall have the general supervision of the interests of the health and life of the citizens of the State. They shall have charge of all matters pertaining to quarantine; they shall supervise a State registration of marriages, births and deaths, as hereinafter provided; they shall have authority to make such rules and regulations and such sanitary investigations as they may from time to time deem necessary for the preservation or improvement of the public health.

A law that has for its object the "general supervision of the interests of the health and life of the citizens of the State," and that confers authority to make "such sanitary investigations as they (the Board) may from time to time deem necessary for the preservation or improvement of the public health," is certainly a most humane and beneficent one, and should not only be sacredly cherished and guarded, but so strengthened and amended as to make its provisions more easy and certain of enforcement.

It is a trite saying and yet a momentous truth—"PUBLIC HEALTH IS PUBLIC WEALTH." Life is not to live, but to be well.

It would be impossible to attempt to give in detail the benefits derived from sanitary science in various communities. One or two noted examples must suffice:

The population of London in 1650 was about half a million. The death rate was *80 persons annually* out of every one thousand of the population, and the average duration of life was only 25 years! The streets were narrow, poorly paved; the sewers, badly constructed as they were, were the repositories of all manner of filth; the wooden houses were over-crowded and poorly ventilated; water was scarce and contaminated; and the personal habits of the people were such as to depress and enervate. Is it any wonder that the plague visited such a place; that in one night alone 3,000 perished from this terrible filth-seeking scourge? Or that from 1665 to 1680 one hundred thousand died from the plague alone?

But now how different! Though the population has increased by many millions, yet under the beneficial influence of wise and liberal sanitary measures, the average of human life has been raised from 25 to 37 years and the death-rate reduced from 80 to 24 per one thousand of the population! Who can, by dollars and cents, estimate the benefits accruing to individuals and to the State by such a change!

Lord Stanley has truly said: "Don't fancy that the mischief done by disease spreading in a community is to be measured by the number of deaths which ensue; that is the least part of the result, and in the battle, the killed bear but a small proportion to the wounded. It is not merely by the crowded hospitals, the frequent funerals, the destitution of families, or the increased pressure of the public burdens that you may test the sufferings of a nation over which sickness has passed; the real and lasting injury lies in the deterioration of the race, in the seeds of disease transmitted to future generations, in the degeneracy and decay which are never detected 'till the evil is irreparable."

It may not be amiss to place side by side the results of some observations touching the benefits of intelligent sanitary regulations on the one hand, and the consequences of a neglect of such measures on the other hand. Stockholm, with an annual mean temperature of 40° F., with natural advantages to make it one of the healthiest cities of the world, as a result of imperfect drainage, poor supply of water to the residences, and an almost total neglect of sanitary precautions, shows by its annual death-rate that it is one of the unhealthiest cities in that part of Europe. Calcutta, with its high temperature—though built on a swamp, and surrounded by lakes supplied by water from

overflows of the Hoogley, in that portion of the city inhabited by Europeans, and subjected to thorough drainage, and to the operation of intelligent sanitary laws, has become as healthy as any city of the same latitude on the globe!

Dr. James E. Reeves of Wheeling, West Virgiana, late President of the American Public Health Association, in an able and interesting paper read before that body at its session in 1883, on the "Eminent Domain of Sanitary Science," says:

> No jurist questions the right and duty of government to make and enforce laws for the protection of the public health; to secure not only as long a life as nature can give, but likewise as healthy and happy a life as possible.
>
> The State erects imposing and costly edifices for the detention and punishment of criminals, for the education and care of the blind and deaf, and for the treatment of the insane. To support such establishments, with all their necessary appointments, hundreds of thousands of dollars are annually paid out of the public treasury, and the burden of taxation for that purpose is constantly increasing. Why not enact statutes to diminish the factors which *furnish* such charges to the State?

In the estimation of the value of sanitary and preventive measures a most important and stupendous fact is constantly overlooked, and that is, there are no means by which an estimate of such efforts can be made? If an infectious disease invades a community and is promptly arrested, it is not hard to form some calculation as to the beneficent work of Boards of Health. But who can estimate and realize the unseen forces used by sanitarians that successfully prevent such outbreaks?

All over this State, and in all States, where preventive influences are at work, who shall say that hundreds of lives are not annually saved, and yet the saving hand is not recognized—is scarcely acknowledged. Laws that ignore, or fail to provide adequate means for enforcing proper sanitary measures are singularly inconsistent in their protection and punishment. If a man commit murder he may either be hung or sent to the State prison for life, but preventable disease—scarlet fever, diphtheria, typhoid fever, small-pox, and other death-dealing agencies—may stealthily enter the household, kill the family, and be innocently regarded as an act of "divine providence."

A few years ago, before the passage of the present State Board of Health law, a man entered the office of the Secretary of this Board, (who was then practicing medicine in this city.) He detailed a train

of symptoms, and presented such physical signs as led the physician to inform him that he had small-pox. At first he stoutly denied having been exposed, but finally admitted that he was traveling with a circus show—that some of the others had been taken down with the disease, and that he had not been vaccinated. He said he would go to the Rock Island depot, take the sleeper, go to West Liberty, thence to Cedar Rapids on the Burlington, Cedar Rapids & Northern Railroad, and thence on the C. & N. W. to his home in Calamus! The physician expostulated with him—told him he was not only unfit to travel, but that he surely would spread the disease broad-cast over the country. He said he *would* go and started for the door. He was locked in the office, and the Mayor of the city notified. The reply of the Mayor was: "Why the thunder didn't you let him go!" "What can we do with him?" The result was, he was kept in the office for two days—fed and cared for by the physician, and finally taken to a hastily improvised pest house where the case rapidly developed into a maligant and fatal form of confluent small-pox!

How different such a case would be managed now! Then, the physician on his own responsibility, simply as a humanitarian, and because he was a physician, without any provision for, or hope of reward, at great personal risk to himself and family, at great pecuniary loss and professional embarrassment, without the sympathy, and with the tardy and reluctant co-operation of the city, stood alone, the defense of the people against this loathsome disease. Now, under the intelligent and co-operative management of the State and local Boards of Health, backed by the strong arm of the law, such a case in a few hours would be disposed of, and the disease by prompt isolation and vaccination, corralled at once!

As a brief outline of the work done by the Board during the two years last past, in the prompt suppression of threatened epidemics—in the liberal efforts to educate the people of the State upon sanitary matters by the diffusion of sanitary literature, and in the thorough organization of local boards ready to promptly and intelligently carry out the rules and regulations of the State Board, it may be said fully fifty thousand pamphlets containing rules for the prevention of contagious diseases, and information upon sanitary and hygienic subjects have been gratuitously distributed among the people, in the English, Swede, German and the Bohemian languages.

In addition to these pamphlets and circulars, the Secretary, by

order of the Board at its last meeting, issued for June, 1887, the first copy of a "Monthly Bulletin," an edition of five thousand copies. This Bulletin is the official organ of the Board of Health, and will contain the official orders and decisions of the Board, and a compendium of sanitary and hygienic matters current within the State. The object is to give local boards and the public such timely information regarding the public health as may be of interest, and which now only reaches them in the biennial report of the Board. This Bulletin will be sent to all health boards and health physicians, and to such other parties as may be interested in sanitary matters, including sanitary legislation.

STATE BOARD OF MEDICAL EXAMINERS.

The late medical practice act defining the qualifications of persons desiring to practice medicine in the State of Iowa, and making the Board of Health a board to carry out its provisions was a step—a long step in the interest of sanitary science and preventive medicine. The labors of the Board of Health and its responsibilities have been greatly increased thereby, but not without adequate compensation in securing for the State an ever increasing improvement in the character and status of those whose duty it is as much to promptly recognize the approach and presence of contagious diseases, and thereby the more certainly to restrict their progress, as to successfully treat them. The manifest tendency of this law will be—has already been—to elevate the standing of the profession by not only requiring a good preliminary and professional education on the part of those seeking to practice, but also to crowd out self-styled medical colleges which only exist for the purpose of conferring degrees—utterly regardless of the literary or professional qualification of these seeking their diplomas.

In order to have a uniform standard for all the colleges recognized by the Board, soon after its organization the Board adopted the following schedule of minimum requirements of medical colleges:

I. CONDITIONS OF ADMISSION TO LECTURE COURSE.

1. Creditable certificates of good moral character.
2. Diplomas of graduation from a recognized College, Scientific, or High School, or lacking this, a thorough examination in the branches of a good English education, including Mathematics, English Composition and Elementary Physics, or Natural Philosophy.

II. BRANCHES OF MEDICAL SCIENCE TO BE INCLUDED IN THE COURSE.

1. Anatomy.
2. Physiology.
3. Chemistry.
4. Materia Medica and Therapeutics.
5. Theory and Practice of Medicine.
6. Pathology and Pathological Anatomy.
7. Surgery.
8. Obstetrics.

III. LENGTH OF REGULAR GRADUATING COURSES.

1. The time occupied in the regular courses, or sessions from which students are graduated shall not be less than five months, or twenty weeks each.

2. Two full courses of lectures, not within one and the same year of time, shall be required for graduation with the Degree of Doctor of Medicine.

IV. ATTENDANCE AND EXAMINATION, OR QUIZZES.

1. Regular attendance during the entire Lecture Courses shall be required, allowance being made only for absence occasioned by the student's sickness, and such absence not to exceed twenty per centum of the course.

2. Regular examination or quizzes, to be made by each lecturer or professor daily, or at least once each week.

3. Final examination in all branches to be conducted, when practicable, by competent examiners, other than the professors in each branch.

V. DISSECTION, CLINICS, AND HOSPITAL ATTENDANCE.

1. Each student shall have dissected during two courses.

2. Attendance during at least two terms of clinical and hospital instruction, shall be required.

VI. TIME OF PROFESSIONAL STUDIES.

1. This shall not be less than three full years before graduation, including the time spent with a Preceptor and attendance upon lectures, or at clinics or hospital.

VII. INSTRUCTION.

1. The College must show that it has a sufficient and competent corps of instructors, and the necessary facilities for teaching dissections, clinics, etc.

VIII. GRADUATES TO MATRICULATES.

1. The aggregate graduates of a college shall not exceed forty-five per cent of its aggregate matriculates during the period of five years ending with any session subsequent to the sessions of 1885-6.

This schedule is similar to that adopted by several of the States—indeed it is believed by all, having similar medical practice laws. Under its application by this Board, several disreputable colleges have been refused recognition and their graduates (?) required either to attend some better school, pass the examination of the Board, or emigrate.

Another beneficial feature of the medical practice act and one rendering it of great service to the State Board of Health, is the fact that under its provisions this office has the address of every legitimate physician in the State, and as a result the Board is enabled to address them personally, and thereby secure the co-operation of a much larger number of the profession in sanitary work, and in the collection of vital statistics.

With a view of more fully enlisting the professions generally in this important branch of sanitary work—the gathering of vital statistics, the following circular is put into the hands of every one who receives our certificate—and hence of every one who is engaged in the legal practice of medicine in this State:

STATE OF IOWA, HEALTH DEPARTMENT,
OFFICE OF THE STATE BOARD OF HEALTH,
DES MOINES, Feb. 25, 1887.

To the Medical Profession of Iowa:

The State of Iowa has conferred on you the dignity and honor of legal recognition as physicians, and in return expects and requires of you certain public services.

The State Board of Health Law, (Chapter 151*), enacted in 1880, and not repealed nor changed by the Medical Practice Act of 1886, not only requires

*Sec. 5. It shall be the duty of all physicians and midwives in this State to register their names and post-office address with the Clerk of the District and Circuit Courts of the county where they reside; and said physicians and midwives shall be required, under penalty of ten dollars ($10), to be recovered in any court of competent jurisdiction in the State at suit of the Clerk of the Courts, within thirty (30) days from the date of their occurrence, all births and deaths which may come under their supervision, with a certificate of the cause of death, and such other facts as the Board may require, in the blank forms furnished, as hereinafter provided.

Sec. 6. When any birth or death shall take place, no physician or midwife being in attendance, the same shall be reported by the parent to the Clerk of the District or Circuit Courts, within thirty days from the date of its occurrence, and if a death, the supposed cause of death, or, if there be no parent, by the nearest of kin not a minor; or, if none, by the resident householder where the birth or death shall have occurred, under penalty provided in the preceding section of this act.—*Ch.* 151, *Laws* 1880.

A practicing physician should report births and deaths to the Clerk of the county where the same occurs, without reference to where he is registered, or where he lives.—*Attorney-General, Jan.* 4, 1881.

all physicians and midwives practicing in Iowa to register with the Clerk of the District Court of the counties wherein they practice, but also requires a report of every birth and death, as well as the cause of such death to the clerk of the county wherein such birth or death occurs.

The reports in this office show that there has been great negligence in this matter; that while some counties send in good and apparently complete returns, others almost wholly ignore the law. Such faulty and incomplete returns make any deductions based thereon of but little use and therefore do a great injustice to the State. So defective and unreliable have been our returns, and so important did correct reports of vital statistics seem to our late President, Dr. W. S Robertson, that in his last official message to the Secretary, he said: "I wish you would prepare a brief, cogent appeal, and send it to the physicians of the State, urging them to make full and faithful reports of vital statistics."

Such an appeal this aims to be. I would not offend the intelligence of the vast body of the profession in the State by enumerating the benefits of such returns. They are well known and recognized. Still, there are those who have no faith in statistics, and who see no reason why such service should be demanded without due compensation. A decision of our Supreme Court sustaining the legality of such requirements says very justly:

> A physician should honestly endeavor to obtain and report all information required by the regulations of the statute and the State Board of Health. This is his duty as a citizen, and is imposed as an obligation by the ethics of the useful and honorable profession of which he is a member.

Births, marriages and deaths constitute the chief events of human life. The record of these phenomena and of the causes leading to the last named, constitute vital statistics. A faithful registration of births and deaths—the beginning and ending of life—is surely of vital importance to every individual of the State, especially to all physicians and students of sanitary science. Such statistics facilitate the identification of individuals, and thereby aid in the settlement of estates; assist in the detection of criminals; afford data for the estimation of life expectancies; furnish to medical and sanitary science important and invaluable information regarding the state of public health; and throw light upon the causal conditions upon which prevailing diseases occur, thus leading to intelligent methods for prevention. Indeed, the information obtained from such statistics, form the foundation of all researches in sanitary science. Such statistics, in order to obtain due credit, ought to be furnished wherever possible, by the medical attendant and hence it is largely, if not only, through the co-operation and assistance of the practicing members of the profession that reliable reports can be obtained. New Hampshire, Connecticut, Rhode Island, Massachusetts, New York, Michigan and Illinois have reports on vital statistics that are of inestimable value, not only to sanitarians everywhere, but especially to the respective States themselves. Will not the medical profession of Iowa see to it that our State, with a less per cent of illiteracy than any other, is not behind in this particular? Is it too much for this Board to expect that

every licensed physician and midwife in Iowa will in the future make full and reliable reports of births and deaths?

With this, is mailed you the "Nomenclature of the Causes of Death." In reporting the cause of death, please conform to it so far as possible. By mistake, the Latin descriptions are retained under "IX Mal-formations," on page 12. Use only the English.

Blanks for making birth and death returns can be had at the office of the Clerk of the District Court, who is required by law to furnish them to all physicians and midwives in his county. No other form of blank must be used than that prescribed by the State Board of Health, and furnished by said Clerk.

To those who are Health Officers, we would be glad to furnish our pamphlets upon the prevention and restriction of contagious and infectious diseases; and other information desired, pertaining to your duties and powers under the law.

Paradoxical as it may seem, the men and women in the State who are dependent upon sickness and accident—the misfortunes of their fellows—for their daily bread, are the ones to whom this Board of Health looks most confidently for co-operation and sympathy in its work of preventing sickness and accident. Nor will it look in vain, since it has been demonstrated time and again, that the ablest and most efficient sanitarians are to be found within the ranks of the medical profession. What a spectacle—a band of men and women educated for a profession whose remuneration is proportionate to the amount of sickness and accidents occurring, and yet lending their best endeavors to prevent and to restrict disease! And yet there are some exceptions to this rule. So far as this Board of Health has the means of knowing, there is not a single "Faith Healer," nor so-called "Christian Scientist," whose name is enrolled, or who is in any way committed to the work of preventive medicine, in all the land. It has been further observed that in proportion as the profession is liberally educated, in that proportion is it in sympathy with the work and designs of the Board of Health.

Preventive medicine, sanitary science and sanitary legislation, as expressed in the creation of State and local Boards of Health, are advancing with wonderful strides. Already thirty three States of the Union have State Boards of Health backed by laws in most cases

NOTE.—Where a physician practices in more than one county he may authorize, by letter or by proxy, the Clerk of such other counties than that in which he resides, to register his name for him.

ample enough for the successful restriction, if not complete prevention of contagious and infectious diseases.

It is surely assuming no false claims to assert that the intelligent and well-directed efforts of these boards of health have been the means of saving thousands of valuable lives and hundreds of thousands of dollars, besides an inestimable amount of sickness.

If ever there come a golden era in the history of this or any country, it must be an era of good health, and sanitary science will be the most potent factor in its advent!

SPECIAL REPORT.

NEEDS OF SANITARY LEGISLATION.

The practical results during the operation of the health law for six years, demonstrate more conclusively each year the necessity for some change in the law which will render the work of the State Board more effective, and secure a more general fulfillment of the purpose and intent of the law. Pertinent to this end are the following suggestions, made by Dr. Robertson, late President of the Board:

Laws protecting health, the *most valuable possession* of a freeman, are as justifiable as the laws which the State should enact to protect his property; and it is as possible in the one case as in the other to define "the boundary up to which supervision of health by the State is a duty." The sanitarian insists in fact that a man's health is property, and more valuable than his purse. Let him waste either if *he wills;* but he shall not waste either in injuring others against *their will.* Further, since it is the duty of specially competent citizens to suggest remedies for violations of the rights of property, of legislators to provide means to apply these remedies, and of special officers to administer them, it is equally the duty of sanitary experts to suggest remedies for violations of every man's right to health, of legislators to provide means to apply these remedies, and of boards of health to execute the measures provided. Admitting that social progress primarily requires from the State protection of life from violence, of property, and of

liberty, it is confidently claimed that the next important step for future progress, due by the State to every citizen is the protection of his life from disease inflicted against his will by others, and that the duty of the State is to furnish this protection.

It is too manifest to require proofs in detail, that the experience of civilized nations during the last thirty years has conclusively demonstrated that sanitary laws and boards of health have promoted the general acquisition of sanitary knowledge, and have thereby tended to develop the greatest self-helpfulness of the people in matters pertaining to general health. "That it comes within the proper sphere of government to repress nuisances is evident. He who contaminates the atmosphere breathed by his neighbor is infringing his neighbor's rights. Men have equal claims to the free use of the elements, having faculties which need this free use of the elements for their due exercise, and having that exercise more or less limited by whatever makes the elements more or less unusable, are obviously trespassed against by any one who unnecessarily vitiates the elements and renders them detrimental to the senses; and in the discharge of its functions as protector, a government is obviously called upon to afford redress to those so trespassed against."

If this statement be true (and no one can gainsay it), what citizens, unless sanitary experts, can determine what are, and can devise the means which should be applied for, contaminations detrimental to health, of the air, of the "elements" (which are presumably water, soil and food, as well as air)? By what mechanism, except that of the law, can these detrimental contaminations be defined and means for their rectification be provided? and by what officers other than sanitary experts, can the duties be efficiently executed? It is admitted that "nuisances" should be repressed by the State? What are nuisances? anything producing damage or even annoyance. What things damage health? The progress of sanitary science continually increases their number, and also the number and efficiency of the remedies therefor; hence, sanitary laws must be as constantly increased by the State, under the present condition of man's existence, either to organize a sanitary administration, or to refrain from using the most efficient means to repress nuisances—a governmental duty which Spencer declares is "evident" and "obvious."

To insist that it is the duty of the State to repress trespasses on a man's health, and yet insist that the State should shift the discharge of this duty upon private citizens whether individually or collectively is a *reductio ad absurdum.* Even the greatest sanitary enthusiast demands no more from the State than that it should wisely determine what are sanitary nuisances, should protect therefrom all persons who appeal for redress, and should provide the most efficient means to accomplish these ends. The State politically, but not in the sense of party politics, and the people personally—in every sense—have the deepest interest in what is called State preventive medicine. Disease among a large class is often but another name for poverty, pauperism, orphanage and bankruptcy. In Philadelphia in 1871-2,

some forty-five hundred people perished from small-pox. The reported loss of business there at the time and from this disease was sixteen millions of dollars, besides a cash value in human lives of five million dollars more. The State imposes certain qualifications upon the dealers in drugs. A more important duty is the enactment of wholesome laws to prevent disease. This is done without infringing upon the personal or political rights of any citizen. A decent care for the people by the State, and a decent respect for the government by the people establishes reciprocal relation, which no party can neglect. The lives, health and happiness of all classes of citizens depend upon these mutual observations of duty; and hence, the existence of State Boards of Health, all created by law to present, discuss and enforce obedience to the laws passed. The law, in all its provisions is for the common good. It is a simple application of the science of medicine in the form of remedies, or preventions to the people of the State. It teaches not only the inestimable blessings of light, air and water, of ventilation and drainage in dwellings and places of business, but the absolute need of the best use of these great gifts in nature, chemistry and discovery.

Your State Board of Health asks not of you the enactment of laws which so often thrill the body politic by the possession of place, patronage and power, but simply that you enable them still further to engage in the paternal work of saving the lives and promoting the health of the people of Iowa. The appeal is to the common sense and practical humanity of the members of the legislature.

The motives for the needed work are the highest of man's best nature, "since the greatest good of the greatest number of the people," is all that is asked.

The valuable work done by Iowa's State Board of Health during the last biennial period has received the commendation of sanitarians throughout the land. Our great desire is to do more and better things in the line of sanitary science and public hygiene. The State Board of Health asks but little in the way of amendatory legislation; this little is found to be needed and essential to the efficiency of the work of the Board in the better promotion of the sanitary interests of the State."

MALARIAL INFLUENCES.

Malarial influences constitute a large factor in swelling the mortality lists of this State. Iowa is comparatively free from malaria or miasmatic poisoning; yet the total number of deaths, and they represent but a small portion of the cases of malarial disease occurring in the State, is by no means inconsiderable.

The practical inquiry, therefore, is, what can be done to reduce this amount of sickness and death?

The conditions most favorable to the production of malaria, which means bad air, are heat, moisture and vegetable decomposition. Though often called, and under certain conditions truly called, "marsh miasm," yet marshy districts, while covered with an abundance of water, are not notably malaria producing. Such districts, however, when dried up and subjected to the intense heat, and the destruction of a rank vegetation, are especially dangerous; and yet the disease appears under seemingly very different conditions. Furguson, the eminent English surgeon, states that the English army, under Wellington, when in Estremadura, a country so dry and arid that the rivers and smaller streams were but mere lines connecting widely detached pools, was so reduced by remittent fever that "all Europe believed the British host was extirpated."

He states further, that a scourge of like malignity assailed the same army when in a bare open country as Ciudad Rodrigo is approached from Portugal—a district "so burned up that the whole country resembled a brick ground." Yet both these districts in the rainy season were flooded with water and were then healthy—only sending out their poisonous exhalations when dried or drying up under the scorching rays of the sun.

There is no need, however, to go abroad for illustrations of the pernicious effects of malaria. In our own State the disease is most prevalent along the water courses—especially the sluggish streams with low and hence often overflowed banks; and in swampy districts, where the water and excessively exhuberant vegetation of the spring and early summer are replaced by the dried and heated surface and the decaying vegetable growth.

Wise measures for the prevention of this malarial poisoning are being instituted in many parts of the State. The great amount of drain tile used throughout the State, reclaiming, and promptly carrying off the water from our large swampy areas is to be commended quite as much for sanitary as for economic and financial reasons.

Some of the counties of the State have also wisely appropriated funds and inaugurated enterprises looking to the deepening and straightening of water courses. If such measures, together with the tile draining, were adopted generally throughout the State, it would be impossible to estimate the sanitary advantages to the State.

There is scarcely a State in the union the topography of which affords such excellent facilities for drainage as Iowa. And yet, it would not accomplish much, nor be desirable to expend public money in effecting such drainage, and about our homes and in our cities to allow ponds and cesspools, and polluted alleys, and the accumulation of all kinds of garbage to exist.

It has been ascertained that in the malarial districts of Australia, great benefit has been derived from growing the Blue Gum tree—the *Eucalyptus Globulus* It is also entensively grown in the malarious districts of Italy with great apparent benefit, and is popularly known as the "fever tree." This noble and gigantic tree grows rapidly, and is a wonderful consumer of water. Its virtues are supposed to reside in the camphoraceous nature of its foliage and its moisture-consuming properties. It is also said to grow extensively, and to a great size in California. If it can be, and were grown in Iowa, especially in marshy districts, it might become a potent adjutant to a system of drainage already outlined. I do not recollect having noticed the results of efforts to grow this tree in Iowa. It is said to do well in a climate with a mean temperature of 60° F., but that it is incapable of surviving a temperature below 27° F. This would exclude it from most of Iowa.

It is a fairly well established fact that the common Sun Flower is also an anti-malarious agent, and that in districts where it is extensively grown, malarial diseases and yellow fever seldom occur, and if occurring, are so modified in their type and so mild as to be but slightly fatal. Since Oscar Wilde declares the Sun Flower æsthetic, and the poultry man praises its seed as a most excellent poultry food, and sanitarians believe its culture conducive to health, no reason exists why it should not be more extensively grown.

REGISTRATION OF BIRTHS AND DEATHS.

It is to be regretted that many physicians throughout the State habitually, and some even obstinately, refuse, while others neglect, to report births and deaths. If some law was enacted by which these occurrences could be reported as fully and reliably as marriages, then

indeed, would vital statistics be valuable, and the benefits accruing therefrom be easily and satisfactorily demonstrated.

Instead of a cheerful compliance with the law we have, in one county the physicians of the County Medical Society, by deliberate resolution declaring they will ignore the law, while in no county perhaps, is there a faithful report made to the clerk. With such a state of affairs the best we are able to do in the way of a registration report, is to give approximations.

The law contemplates, and the Board expects, these reports to be made largely by the physicians and midwives of the State, except in the few cases where no physician nor midwife was in attendance, in which case the parent or nearest kin of the party born or dead, should report.

The recent law of Minnesota declares that the "clerk or health officer shall on or before the fifth day of *each month* transmit to the Secretary of the State Board of Health a certified copy of the registry of births and deaths which have occurred * * * during the calendar month immediately preceding." Believing the physicians of the State needed to be educated up to the importance of such statistics to the profession itself, to the public and to the sanitarian we issued the address to the physicians and midwives of the State previously referred to. Already the appeal is bearing good fruit and the physicians in many parts of the State are writing this office and expressing their determination to heartily co operate with the Board; and yet these reports so cheerfully furnished by many will be greatly neutralized in their beneficent designs by the obstinate or neglectful non-compliance of others.

THE SWINE PLAGUE.

Prof. Stalker, State Veterinary Surgeon, reports hog cholera as widely distributed throughout the State, and that it was impossible with a small force to prevent its spread. He has great confidence in the efforts made to control it by inoculation. The course of these epidemics furnish a subject of interesting study. Commencing at a given point the disease moves forward in lines of infection—widening as it progresses.

As the disease never arises spontaneously, but originates and is propagated only by contagion, quarantine and isolation furnish the best means for arresting it. The death of the hog seems to end its infectious power as shown by the fact that where healthy hogs have access to those dead from the disease, and feed upon their carcasses, root among them, sleep contiguous to them in all stages of decomposition, they seldom contract the disease.

Mr. R. A. Wilson, of Nebraska, claims that the cause of hog cholera is worms. He exhibited several specimens taken from hogs alleged to have been sick with cholera, showing large round worms in the œsophagus, gall-duct, lungs and intestines—the latter being completely plugged by them. His theory is that the presence of the worms produces inflammation which dissolves the worm, and which when liquified becomes an irritant to the bowels, destroying their coating—and in other cases filling up the windpipe so completely as to produce suffocation.

The Board, while recognizing the fact that worms frequently infest hogs, and often produce death, as demonstrated by Mr. Wilson, yet believe that hog cholera is a very different affection, and arises from a very different cause.

At the meeting of the American Public Health Association held at Toronto, Canada, October last, Prof. D. E. Salmon, of the National Bureau of Animal Industry, in an interesting paper on "Recent Progress of Hog Cholera," said that numerous experiments had been made during the year, which abundantly confirmed the conclusion that the disease was caused by a bacterium; and he was sanguine in the belief that inoculation would eventually afford the means by which the disease could and would be prevented.

You are respectfully referred to the able report of Prof. Stalker, in which the character and prevalence of the various diseases of domestic animals are fully discussed.

TRANSPORTATION OF CORPSES.

Upon complaint of railroad companies made to the State Board that the rules regarding transportation of corpses were seriously

defective, in that they provided no security against exposure to contagious disease, and damage to property from leakage of fluids from the dead bodies in transit, the subject was fully discussed at the annual meeting of the Board in May, 1886, and the following rules and regulations were made:

RULE 1. The transportation of bodies dead from small-pox, Asiatic cholera, typhus fever, and yellow fever is absolutely forbidden.

RULE 2. The bodies of those dead from diphtheria, scarlet fever, typhoid fever, erysipelas, measles, or other contagious or infectious disease, except such as are named in Rule 1, must be prepared for shipment by being wrapped in a sheet thoroughly saturated with a strong solution of chloride of zinc, in the proportion of one-half pound of chloride of zinc to one gallon of water, and then enclosed in an anti-septic interment sack hermetically sealed, before being placed in the coffin, unless the coffin used is air-tight.

RULE 3. All other dead bodies may be transported, provided they are inclosed in air-tight wooden boxes lined with zinc, copper or lead; or in air-tight cases. If any other form of coffin is used, the body must be inclosed in an hermetically sealed anti-septic interment sack.

RULE 4. Bodies may be shipped from the various State charitable institutions upon the certificate of the attending physician that the person so shipped did not die of any of the infectious or contagious diseases named in these rules, and that the body has been properly embalmed. In all other cases shipments from such institutions, except hospitals for insane, must be prepared as required by Rule 3.

RULE 5. Every dead body must be accompanied (1) by a certificate of a physician showing the cause of death, or a certificate from the coroner; and (2) a certificate from the shipper or undertaker that the body has been prepared for transportation in accordance with the rules of the State Board of Health, and in case of infectious disease, said certificate shall be made under oath.

RULE 6. All disinterred bodies will be deemed infectious and dangerous to the public health.

Subsequently objection was made to these rules on the ground that they would compel the refusal by Iowa railroads of all bodies shipped from points outside of this State which had not been prepared in accordance with the rules of the Iowa State Board, thus causing much delay and trouble. The State Board therefore, by and with the advice of the Attorney-General, made the following order:

These rules will not be held to apply to the transportation of corpses from one State through the State of Iowa to another State, when it is shown by the certificate of the attending physician or coroner that the death of the deceased person was not caused by any of the contagious dis-

eases named in Rule One; and when such corpse is not unloaded, re-shipped nor discharged within this State.

All corpses of persons who died from diseases named in Rule One are prohibited from being brought into the State of Iowa from another State, or transported within or through the State of Iowa in any manner, or for any purpose.

All bodies dead from contagious diseases specified in Rule Two, must be prepared for shipment as required by said Rule; otherwise they must not be brought into, nor transported through the State of Iowa from another State.

TYPHOID FEVER AT SWAN.

In October, 1886, an outbreak of typhoid fever occurred at Swan, in Marion county, in which there were about thirty cases, with a large number of deaths. Personal investigation was made on request of the local board, when it was found that in the locality where the largest amount of sickness existed the people used water from a surface spring situated on a hillside. Directly above, and on either side, with the trend of the surface toward this spring, were pig stys, cow-sheds and privies. One of the earliest deaths occurred in a public house. The well in connection with this building was badly situated. The ground about it was low, and the washings from the houses on the higher ground, on the opposite side of the street, found their level contiguous to this well. A large proportion of garbage and slops from the kitchen were also deposited here. Samples of water from the spring and well were procured, which upon analysis by Prof. T. W. Shearer, were found to be totally unfit for use, as will be seen by the following report:

DES MOINES, IOWA, Oct. 22, 1886.

J. F. Kennedy, M. D., Sec. State Board of Health, Des Moines, Iowa:

DEAR SIR—The following is the report of the two samples of water from Swan, Marion county, suspected of having been the cause of the typhoid epidemic in said town:

NAME OF WATER.	GRAINS PER GALLON.		PARTS PER MILLION.	
	Solids.	Chlorine.	Free Ammonia.	Albuminoid Ammonia.
No. 1—Water from surface spring.....	121.6	7.61	17.2	21.2
No. 2—Water from public house well.	75.83	1.67	0.12	1.04

The large solid residue is principally organic matter. 0.15 parts per million of albuminoid ammonia condemns a water, and it will be seen that the amount in sample No. 1, is one hundred forty-one and one-third times fifteen hundredths. This is the representative of injurious organic matter existing in the water.

The free ammonia, which is usually the product of putrefaction or decomposing organic substances, is very large, particularly in sample No. 1. Eight-hundredths of a part per million is a large amount of free ammonia to find in a potable water; and any considerable amount more than eight-hundredths of a part per million parts unfits a water for use.

These samples are filthy in the extreme.

No. 1 is a fair sample of sewage containing large quantities of urine and other organic filth.

Although the microscopic examination failed to reveal the bacterium which always accompanies typhoid fever, the above samples furnish a most excellent soil for the typhoid germ; and there is not the slightest doubt but that the impure water supply was the cause of the sickness at Swan.

Very respectfully,

T. W. SHEARER, M. D.

NATIONAL AND PROVINCIAL CONFERENCE OF BOARDS OF HEALTH.

It was my pleasure, as the representative of the Board, to attend the late sessions of the "National and Provincial Conference of Boards of Health" and the "American Public Health Association," held at Toronto, Canada, Oct. 4th. Both conferences were well attended. Reports were made by delegates for several States, showing an encouraging and rapidly growing tendency to hearty co-operation between State and local boards of health. Our neighbors, Minnesota and Illinois, are particularly efficient. Dr. Rauch, of Illinois, read an interesting paper on the desirability of an "Uniform Policy Toward Medical Colleges." He noticed with pleasure the increasing

tendency of medical colleges to elevate the standard of medical education by requiring a higher preliminary, and longer and more thorough courses of preparatory instruction. He deprecated the multiplication of medical colleges, many of which were practically nothing but diploma mills, and believed that if the States having laws similar to those of Illinois, Minnesota, Missouri, West Virginia and Iowa, were to unite through their Boards of Health in a refusal to recognize the diplomas of all colleges not coming up to a reasonably high standard of requirements for matriculation, as well as graduation, a great improvement in the character of the graduates would soon be apparent.

Dr. Lindsley, of Tennessee, advocated the teaching of preventive medicine in the public schools—even schools of low grade.

Dr. Thornton, of Memphis, read a paper on "Six Years of Sanitary Work in Memphis," in which he showed a marked decrease in the sickness and death-rate, owing to very material sanitary improvements that had been made since their great outbreak of yellow fever.

Dr. L. F. Salomon, Secretary State Board of Health of Louisana, offered the following resolutions, which were adopted:

WHEREAS, It is necessary for the protection and preservation of the public health that prompt information should be given of the existence of cholera yellow fever and small pox; be it

Resolved, 1. That it is the sense of the National Conference of State Boards of Health that it is the duty of each State, provincial and local board of health in any locality in which said diseases may at any time occur to furnish immediate information of the existence of such diseases to boards of health of neighboring and provincial States, and to the local board in such States as have no State board.

2. That upon rumor or report of the existence of pestilential disease, and positive, definite information thereon not being obtainable from the proper health authorities, this Conference recommends that the health officials of one State shall be privileged and justified to go into another State for the purpose of investigating and establishing the truth or falsity of such reports.

3. That, whenever practicable, the investigations made under the preceding section shall be done with the co-operation of the State or local health authorities.

4. That any case which presents symptoms seriously suspicious of one of the aforenamed diseases, shall be treated as suspicious, and reported as provided for in cases announced as actual.

5. That any case respecting which reputable and experienced physicians disagree as to whether the disease is or is not pestilential, shall be reported as suspicious.

6. That any case respecting which efforts are made to conceal its existence, full history and true nature, shall be deemed suspicious and so acted upon.

7. That in accordance with the provisions of the foregoing resolutions, the Boards of Health of the United States and Canada represented at this Conference, do pledge themselves to an interchange of information as herein provided.

AMERICAN PUBLIC HEALTH ASSOCIATION.

The American Public Health Association at Toronto, Can., was a large and enthusiastic gathering, the Canadian Provinces being specially well represented. Nearly every State in the Union was represented, the far South having representatives from Alabama and Louisiana. One of the distinguished visitors from abroad was the venerable and learned Dr. Russell, of Glasgow. An interesting paper on "Destruction of Night Soil and Garbage by Fire," written by Dr. George Baird, of Wheeling, W. Va., was read by Dr. Reeves, of West Virginia. Among other things, he said that special contagious and infectious diseases are propagated, and that many diseases are disseminated by pollution of the air and drinking water. The health authorities of Wheeling have, for several years, been trying to devise a plan for so disposing of these substances as to protect their own people as well as those in a neighboring city. To furnish an example of the folly of claiming that a running stream of water will purify itself in a few score of feet, Dr. Baird gave the relative situation of Wheeling and Bellaire, both on the Ohio river, showing that the drinking water of the latter city some four miles further down the river was abominably polluted, and that the lower city was made a hotbed of disease through the emptying of the sewage of Wheeling into the stream. The furnishing of nightsoil to gardeners as a fertilizer had been tried; also the giving of the garbage to dairymen. These plans had resulted in polluted wells and diseased cows. The Health Department of Wheeling claimed that at last they

had secured a means of entirely destroying these substances, and their power to do evil.

Two facts about the burning of nightsoil especially impressed them in their experiments—one the odor which was emitted, akin to the smell of burnt leather; another, the intense heat required to burn it. The first experiments were made in a heat of five fire retorts at the city gas works. The authorities, convinced by experiments that the retorts were not the proper things for successful combustion of this substance, determined to find a furnace with a strong draft, capable of producing a greater heat than could be obtained in the retorts. The use of a boiling furnace was obtained from the nail factory for a third experiment. After twenty-four hours heating, a charge of twenty per cent of fine slack, and eighty per cent of nightsoil was made, and it was burned in one hour and twenty minutes. A second charge of "breeze" and nightsoil was made, and it was burned in a little more than one hour. A third charge of nightsoil alone was made, and it was burned in about the same time as the first charge. A trial was subsequently made of a Smith furnace for burning the nightsoil and garbage, the result of which was that a barrel of ordinary garbage was burned in four minutes, and a barrel of butcher's offal was burned in seven minutes. A barrel of fluid nightsoil thrown into the furnace from buckets was almost instantly evaporated, and a barrel of solid fœces was burned in fifteen minutes. In consequence the Committee on Health recommended in favor of the Smith furnace, and the Council awarded a contract for the building of a furnace capable of destroying daily sixty tons of nightsoil and garbage, and also for burning dead animals. The furnace is to be constructed for using natural gas as a fuel, the heat of which is four times greater than that obtained from coal.

It was decided to appoint a committee to inquire into the destruction of garbage and nightsoil by fire, and report to the Association.

Dr. Edward Playton, of Ottawa, read a paper of great value on "Our Inland Lakes and Rivers, the Disposal of Sewage, and the Spread of Infectious Diseases."

Mr. Allan Macdougal presented, through Dr. Coverton, a paper on "The Toronto Sewers," and Dr. Oldright, of the Toronto Board of Health, one on "The Influence of Sewage on Health." These three papers, though of special local importance, were prepared with great

care, and elicited marked attention because of their general applicability. Dr. Oldright showed that Frankfort-on-the-Main had reduced her mortality from Typhoid Fever from 87 to 24 per 100,000, by an improved sewage system. Oatzic, by the same means, had reduced its mortality from 108 to 90 per 100,000. Toronto's mortality from Typhoid Fever was 65 per 100,000 annually.

The following resolution was offered by Dr. Van Bibber, and was referred to the executive committee without debate, and laid over until the next meeting:

Resolved, That since it has been proved that the hydrated oxide of methyl or alcohol is not a food nor in any way a necessary nutrient to the support of human life, but on the contrary, that its effects, when used in excess, are cumulative and contrary to the intellectual, moral, and physical advancement of man, therefore, it is proper that this Association should declare this, its opinion, and further, be it resolved that we are in hearty sympathy with those who desire to have its excessive manufacture in its various forms curtailed, and the means of dispensing it broadcast among men, regulated by the laws of different nations.

Dr. Nathan Allen, of Lowell, Mass., read a paper on "The Relations between Sanitary Science and the Medical Profession." Sanitary science, he said, meant the application of laws or principles for the preservation of health, in whatever way they might be employed. It was about forty years since this subject began to attract general attention, it having started with the establishment of the registration of birth, deaths, and marriages in Great Britain by Dr. Wm. Farr. The aim of sanitary science was not merely to remove the existing causes of diseases, but to destroy the germs or seeds of disease. When the principles of this science were applied to the fullest extent they would present the human body so sound and healthy in all its parts as in a great measure to forestall disease. There was a normal standard of physiology, where all the organs were so sound and well-balanced, and where all perform their functions so thoroughly, as to afford small chances for disease. This organization represented the highest standard of health, and the nearer the human body, in all its parts, approximates to the standard, the better or higher degree of health shall every such person possess. With this view of physiology, it would be seen that all disease was a violation of law, whether it arose from internal or external cause. As there must be some change in the structure or functions of certain organs in the body, for the introduction of disease, was it not clearly the province of sanitary

science to take cognizance of such changes? If the violation of law could be arrested or modified in the very first stages, might it not serve to prevent a vast amount of disease? The improvement of the organization of individuals with the use of proper means and the perfection of the human organization by a proper application of the laws of inheritance for three or four generations, was not merely a theory of speculation, but a doctrine based upon the laws of physiology. The more thoroughly physiology was studied with reference to sanitation the stronger was the evidence that man was the artificer of his own physical well-being. Never before had there been such earnest inquiry made on the part of the profession to ascertain the true causes of disease. It had been found in the moral world, that in order to eradicate great evils their primary causes must be first removed. So in the prevention, the same course must be taken. This accorded with the teachings of sanitary science. Leading members of the medical profession had, in this connection, been doing a noble work.

Dr. David Prince, of Jacksonville, Ill., read a paper on "An Experimental Study in Relation to the Removal from the Air of the Dust or Particulate Material supposed to produce Yellow Fever, Small-pox, and other Infectious Diseases." The study of the subject in relation to the purification of the air from the particulate material causing in wounds putrefaction, erysipelas, and hospital gangrene, had led to further thought in relation to infectious diseases. The writer of this paper had been for two years making an experimental study of expedients for securing a dustless atmosphere for surgical purposes. It was not until recently that it had been established beyond dispute that the infection which was chiefly dreaded was not gaseous but particulate, and capable of being separated from the air in which it floated. Finding that air could not be completely deprived of its floating material by water, attention had been given to the devising of a practical plan for purification by the passage of air through cotton. The capability of cotton arresting all particulate material floating in the air was a remarkable discovery. The paper gave a description of a chamber arranged for filteration of the air passed into it through cotton, with which it was surrounded.

Reports were presented by the secretaries of the various State Boards of Health within their respective States, detailing the efforts put forth by the several Boards of Health for the prevention and restriction of disease, and for the education of the people upon the importance of sanitary science and vital statistics.

Interesting reports were presented describing the outbreak and results of the epidemic of small-pox at Quebec.

Mr. Archibald Blue, of Ontario, read a paper on "Food, in its Relation to the Distribution of Wealth."

A most important paper, and one of practical interest to Iowa, especially to her cities desiring paved streets, was presented by Dr. George Baird, of Wheeling, West Virginia, on "Sanitation in Street Paving," in which he said: "Sanitation should be considered by municipal authorities in reference to the material to be used for street paving and the manner of laying it to best protect the lives of citizens. The macadam with its rapidly worn surface and its clouds of dust, carrying disease germs in them; the cobble pavement with its noise and innumerable pockets, furnishing lodging places for decaying animal and vegetable matter; the wooden pavement decaying in a few years, and absording urine of horses and foul liquids of all kinds which were poured on its surface; and the granite with its noise far exceeding the cobble, its slippery surface when worn, and its open crevices between the blocks permitting liquids of all kinds to pass down and polute the street surface beneath were each and all of them subject to adverse criticism. If these statements were true the question naturally suggested itself: Is there any material known suitable for street paving free from such objections and at the same time of such cost as to be within the reach of the great majority of cities and towns desiring to have paved streets? It is claimed by the people of Wheeling that there is such a material and that their city was the first to introduce it; the material is the vitrified paving block. It is an oblong wedge nine inches long, four and three-fourths inches wide, and three and one-sixteenth inches on one edge, and two and twelve sixteenths inches on the other. It is composed of fire clay, iron ore, and silica fused to a homogeneous mass; when the surface of the street is properly graded and rolled the blocks are laid in three or more inches of sand, the broad and narrow edges turned upward in alternate rows and the joints broken as in first-class brick work. The space between the blocks is filled with finely screened gravel, and paving cement being poured on this, they are made completely watertight. Over the surface of the

pavement pitch is poured, and a layer of sand a half inch thick was spread. The life of the pavement is without limit. A renewal of the surface coating of pitch and sand, when worn off, at a cost of one cent per square yard, would prevent all wear of the block. The cost of the pavement is not more than cobble, much less than wood, less than one-half that of asphalt, and not one-third that of granite. A pavement called the Steubenville pavement had attracted considerable attention in the United States. Dr. Reeves said the cost of this paving is $1.40 per square yard.

Dr. Bell, of New York, editor of the Sanitarian, read a paper on the "Disinfection of Rags." This question is a vexed one, and like all others largely affecting commerce, has two sides.

Col. Waring said, so far as known, no infectious diseases had been imported into this country by rags, and intimated rather plainly that what had been said about infectious rags was in the interest of a patent process for disinfecting them. The question is still an unsettled one, and will be heard from again.

Several other papers of interest were presented, and all were more or less discussed.

TRYOTOXICON—MILK POISONING.

In July Dr. J. A. Salts reported a case of apparent poisoning of a large number of guests at a hotel at Corning. The symptoms appeared immediately after an evening meal. Samples of all the food used at the meal and contents ejected from the stomach of the sick were furnished this office and were given to Prof. Shearer for analysis. The following is his report:

DR. SHEARER'S REPORT.

Dr. J. F. Kennedy:

DEAR SIR—I herewith report the results of the analysis of the material supposed to be concerned in the Corning poisoning case. As suggested by the local physician, Dr. Salts, I made a careful examination of the materials for mineral poison, particularly arsenic, but not the slightest trace of mineral poison could be found. The samples of water and flour were faultless. The baking powder contained a very high per cent of alum. The three

samples of milk, the bread and milk of which the patients ate before they were taken sick, and the samples of vomit—which, of course, was the result of their sickness—were all carefully examined, being analyzed for vegetable and animal poisons, and in each and all of these samples a ptomain or animal alkaloid was discovered, which corresponds to the ptomain discovered in cheese, milk, ice cream, etc , by Prof. Vaughn, of the University of Michigan, and named by him "tyrotoxicon," or "cheese poison." The samples were so small that the quantity of poison recovered was of necessity small, yet sufficient was obtained to show it to be a definite crystalline poison. Chemically it behaved very much like coniine, giving similar reactions with sulphuric acid, bichromate of potash, and nitric acid. The crystals are circular in shape, and form salts with sulphuric and acetic acids, having the peculiar resemblance of the sulphates and acetates of other alkaloids. I was unable to form a salt with hydrochloric acid. The poison was extracted after Prof. Vaughn's method, and the same difficulty was experienced in separating and purifying the poison. Upon concentrating the etherial solution containing the poison it assumed the appearance of an oily liquid. A small portion of this oily liquid was given to a half-grown kitten to test the pyhsiological effects of the poison with the following results: There was a slight frothing at the mouth soon after giving the poison, which might be accounted for by the unpleasantness of the dose. This was followed by restlessness, and finally languor, half-closed eyes, and attempts at vomiting. The poison was given at noon, the symptoms come on gradually, probably reaching their intensity between three and four o'clock P. M. The kitten seemed to recover completely from the effects of the poison. The remainder of the liquor was allowed to evaporate spontaneously, and the crystals were recovered and treated as above. They gave the reducing test upon ferridcynanide of potash and ferri-chloride. This, however, is not a reliable test, as milk in general will give this reaction.

A knowledge of the existence and action of the ptomaines is of great importance not only to the physicians, but to the community in general, since these poisons have their growth in the soil of uncleanliness. Just why certain putrefactive changes in cheese should produce tyrotoxicon and a similar process in beef, shell-fish or decaying vegetables and fruit should produce ptomaines corresponding to morphine, strychnine, coniine, etc., is a question that cannot be answered at present. It is certain that the albuminoids or nitrogenous portions of these materials is the part concerned in the development of the animal alkaloids and putrefactive, or at least retrograde changes are necessary for their formation. The amount of putrescence is in some instances exceedingly small, and it is in these cases that the greatest danger lies. What to all appearance is a pure and perfectly healthy article of food may be contaminated with one of these deadly ptomaines. This, however, is the exception. More often there are marked degrees of putrefactive changes.

The case reported above is the exception. Seventeen guests at a hotel in Corning, Iowa, were taken sick after eating of the food served on the table, with all the symptoms of a poison. So marked were the symptoms that

suspicion of criminal poisoning was excited. Close investigation soon detected the milk to be the cause of the difficulty. The milk was kept in earthen vessels in a refrigerator, and even after every precaution was taken to keep the milk pure and sweet and free from contamination, at two succeeding intervals cases of poisoning occurred. The milk was all from the same source—the landlord's cow—and when used, soon after being drawn from the cow, had no bad effects; but on standing twelve hours seemed to develop its toxic qualities, which produced the usual symptoms of tyrotoxicon. In this case we can hardly attribute the difficulty to the care of the milk, and the degree of putrefaction that could take place in well-cared-for normal milk in twelve hours is of little or no importance. The exciting cause must be found in some other source. The feed could not be the cause, for other cows grazed in the same pasture, and no other milk will give any trouble. Is a micro-organism concerned in the change, and if so, what is its value and origin? Is the animal organism at fault, resulting in an imperfect or abnormal product from the secreting cells? Whether the primary cause is or is not found in the above, there are certainly subsequent changes after the milk is drawn from the udder that gives it its toxic nature. Just what these changes are, we are at present unable to say; though there are strong grounds for thinking that putrefaction is concerned, if not the immediate cause. Yet, in some cases these changes are so slight that they are not detectable, and still the poison is there and does its work.

T. W. SHEARER, M. D.

June 30, 1886, Dr. A. L. Cunningham, of Nugent, reported a serious case of poisoning from ice cream as follows:

NUGENT, IOWA, June 30, 1886.

State Board of Health, Des Moines, Iowa:

DEAR SIRS.—This community is suffering from poison, which is undoubtedly caused by eating ice cream. At this time, one hundred and one cases have been reported. The symptoms in every case are the same, only differing in intensity, viz.: rigors, headache, griping pain in the bowels, copious vomiting of a greenish matter, and diarrhœa of a very persistent character. The discharge from the bowels is of a watery, greenish material. On Thursday evening, June 24th, the Presbyterian society held a festival in the village, at which ice cream and cake were dispensed as called for. In a very few hours parties were attacked with above symptoms, and at intervals during Friday, Friday night and as late as eleven o'clock Saturday night, new cases were developed. The ice cream was made in three freezers, from milk supplied by a farmer whose cows are on tame grass. Part of the cream was flavored with vanilla, part with lemon. Some of it was boiled, and some not. One child, ten years old, ate two teaspoonfulls and had convulsions Saturday as a result. One lady ate one dish flavored with vanilla and was very bad. Another ate one dish flavored with lemon and had convulsions. One child ate three dishes with no bad effects. One young man ate four dishes and was very sick. My wife ate three dishes flavored with vanilla with no perceptible effects. The minister ate no cake, so he was sure the poison was in it; but Saturday night he had an attack that doubled him up like a jack-knife. As near as I can estimate about two-thirds of those present are sick. I have made investigations, but so far am not able to trace the poisoning to any particular can. There are a number of theories extant but none satisfactory. All are improving slowly, and no fatal cases. I will not give you my theory as to the cause at present, but would like the opinion of the Board as to the probable cause.

A. L. CUNNINGHAM, M. D.

Investigation disclosed the cause of this sickness to be tyrotoxicon.

Dr. V. C. Vaughn, Professor of Phy. Chem. in the University of Michigan, who has devoted a vast amount of time and experimental research to the investigation of this subject, and who first gave to this poison the name it bears, has since discovered that it is identical with diabenzol. It is developed in milk by the growth of a germ, which multiplies very rapidly when the conditions are favorable. These favorable conditions consist principally of exclusion of air, or the presence of a limited supply of air, and comparatively warm temperature, the germ developing most rapidly at about 98° F. If milk be placed in cans and tightly closed as soon as it is drawn from the animal, and then kept warm, the conditions for the development of the poison are favorable. Uncleanliness would increase the tendency of the milk to decompose, and it might afford the means of introducing the germ into the milk. Feeding the cow improper food, such as swill and refuse from breweries, would render putrefactive changes more likely to occur.

The Doctor says he has abundant evidence from observation and experiment for believing that this poison is an important factor in the causation of cholera-infantum and similar diarrhœas of children. When we remember that these diseases are most prevalent among the poor classes of large cities, where fresh milk is almost unknown, we can readily understand their frequency. It is safe to say that the average number of cases of summer diarrhœa in children coming under treatment annually in the United States is not less than one quarter of a million. Moreover, in the country little attention is given to the food of children. Cows stand and are milked in filthy barns and yards. The udders are not washed before the milking; the vessels for the milk are frequently not as clean as they should be. Thus are thousands of children who must drain their sustenance

from bottles, the cleansing of which is not properly attended to. Crusts of decomposing milk form around the neck of the bottle, in the tube and nipple, and lead to the rapid decomposition of the entire contents of the bottle. It is not claimed that milk is the sole cause of the summer diarrhœas of children, or that tyrotoxicon is the only poison that may be developed in milk. It is only one of many which are developed by putrefaction. A knowledge of the development of these poisons in milk suggests the adoption of preventive measures concerning the care of milk. The following rules are especially recommended for faithful observance:

1. The cows should be perfectly healthy, and the milk of any animal which seems indisposed should not be mixed with that from the perfectly healthy animals.
2. Cows must not be fed on swill or the refuse from breweries, or glucose factories, or any other fermented food.
3. Cows must not be allowed to drink stagnant water; but must have free access to pure, fresh water.
4. Cows must not be heated or worried before being milked.
5. The pasture must be free from noxious weeds, and the barn and yard must be kept clean.
6. The udders should be washed, if at all dirty, before the milking.
7. The milk must be at once thoroughly cooled. This is best done by placing the can in a tank of cold spring water, or ice water, the water being of the same depth as the milk in the can. It would be well if the water in the tank could be kept flowing; indeed, this will be necessary unless ice water is used. The tank should be thoroughly cleaned every day, to prevent bad odors. The can should remain uncovered during the cooling, and the milk gently stirred. The temperature should be reduced to 60° F. within an hour. The can should remain in cold water until ready for delivery.
8. In summer, when ready for delivery, the top should be placed on the can, and a cloth wet in cold water should be spread over the can, or refrigerator cans may be used. At no season should the milk be frozen; but no buyer should receive milk which has a temperature higher than 65° F.
9. After the milk has been received by the consumer it should be kept in a perfectly clean place, free from dust, at a temperature not exceeding 60° F. Milk should not be allowed to stand uncovered, even for a short time, in sleeping or living rooms In many of the better houses in the country and villages, and occasionally in the cities, the drain from the refrigerator leads into a cess pool or kitchen drain. This is highly dangerous; there should be no connection between the refrigerator and any receptacle of filth.
10. The only vessels in which milk should be kept are tin, glass or porcelain. After using the vessel should be scalded and then, if possible, exposed to the air.

With the attention demanded by these rules given to milk, it will become more valuable as food, and the development of poisons in it before it has entered the body will certainly be prevented.

But in this prevention of summer diarrhœas, attention to food must not stop with its introduction into the body. The ferment which produces tyrotoxicon is either the butyric acid ferment or some ferment which is frequently developed with the bacillus butyricus. Butyric acid ferment frequently develops in the stomach. Therefore the prevention of these diseases necessitates some attention to digestion. If the food lies in the stomach undigested, putrefactive changes will occur there.

During hot months, children who are allowed to take food at will, often drink large quantities, simply to quench thirst. Especially is this true when the parent forgets that a child would sometimes relish a drink of good water. This overloading the stomach with milk, caused by thirst, often is of no little detriment. It is hardly necessary to specify in regard to other ways in which attention should be given to the digestive organs of children. Those who partake of other food with their milk should be allowed only the most wholesome articles, and those should be in perfect condition.

RAILROAD ACCIDENTS.

Few have any idea of the number of railroad accidents resulting in death and injuries more or less serious and permanent that occur within the State. That many of these accidents are preventable and should not be allowed, is very clearly and forcibly shown in the reports of the Iowa Railroad Commission. With the view that a wider publicity may be given to their expression on this subject the following extracts are herewith given from their reports for 1885 and 1886:

During the year ending June 30, 1885, *one hundred and fifty-six persons were killed* on the roads in this State. Of these nine were passengers, seventy-two employes, and seventy-five others not connected with the operating of the roads. Fourteen were killed by derailments, fifteen by collisions, two caught in frogs; thirteen coupling cars, sixteen falling from trains,

nine getting on and off trains while in motion, eight at highway crossings, twenty-five from miscellaneous causes, seven from stealing rides, three while intoxicated, forty trespassing on track, and four suicides.

There were *eight hundred and seventy-five persons injured* during the year. Of these eighty-nine were passengers, seven hundred and twenty employes, and sixty-six others. One hundred and seventeen were injured by derailments, forty-four by collisions, three caught in frogs, one hundred and seventy-four coupling cars, thirty-four fell from trains, eighty getting on and off trains while in motion, fifteen at highway crossings, three hundred and fifty-six from miscellaneous causes, seven from overhead obstructions, seventeen stealing rides, twenty three trespassing on track, and five while intoxicated.

The number killed is twenty-seven more than last year, the number injured four hundred and twenty-six more than last year. There were fourteen killed and one hundred and seventeen injured by derailments; this number was undoubtedly largely increased by the accident near Cromwell, on the Chicago, Burlington & Quincy road, on the 8th of February last. That road reports seven killed and fifty-nine injured by derailments. This accident was, we believe, more serious in its character than any that has occurred in the State except that on the Chicago, Rock Island & Pacific railway, at Little Fourmile creek, on the 29th of August, 1877. Fifteen were killed and forty-four injured by collisions; two killed and three injured by being caught in frogs.

COUPLING CARS.

There were thirteen killed and one hundred and seventy-four injured coupling cars. In our judgment this statement imperatively calls for the adoption of some system by which cars can be coupled and uncoupled without going between them—or, in other words, we believe that the time has come when some automatic coupler should be adopted. The Legislature of Massachusetts, in May, 1884, passed an act requiring railway companies to place on all new cars, and those rebuilt and repaired, safety or automatic, couplers, and in 1885 the Michigan Legislature passed a similar law. Experiments have been made with different couplers at various times and places, latterly in the month of September, in the city of Buffalo. At this test one member of this Commission was present, and his views on the subject will be given in another place in this report. That there are a number of safety couplers which are practical we have no doubt, and believe they should be introduced on all roads in the State as fast as can be done with due regard to economy.

On page ninety-four the Railroad Commissioners in the interests of humanity and the public health, make the following earnest plea for the lives and safety of railroad employes, and strongly recommend the use of an automatic or power brake for freight cars:

Equalling in importance an automatic or safety car coupler is an automatic or power brake for freight cars. If the same ratio holds between the numbers killed by falling from trains and those by coupling cars in other States as exists in Iowa, the number killed each year from this one cause is appalling. For the years 1882, 1883, 1884 and 1885 the number killed in this State from coupling cars was fifty-three, falling from trains ninety—nearly twice as many. The fatality of the accidents of falling from cars is much larger than that from coupling cars. In an elaborate editorial article in the *Railroad Gazette*, of September 18 and 25, 1885, it is shown from reliable statistics that there are killed in the United States annually not less than 45[illegible] persons, 4,050 seriously injured, and 13,770 injured, but not in railroad parlance "seriously." The taking off of part of a hand, a finger or thumb or two or three fingers is not reported as a *serious* injury.

Here are fatal and painful accidents, yearly amounting to the vast number of 18,309, an array of figures that is absolutely appalling, and all from the one cause of coupling cars. Now, if as said above, the same per cent holds in other States as here in Iowa between those killed by coupling cars and those by falling from trains, there are not less than 760 men in the very morning of life, when life is worth the most to them and to those dependent on them, sacrificed to this other cause alone, viz: falling from trains.

How fearful to contemplate is this long list of fatal accidents, and how terrible the reality! That men, that human beings should be compelled to go at all times of the night, in all kinds of weather from one end of fast moving trains to the other on top of the cars, no matter how bitter the cold, how blinding the storm, how violent the wind, how icy and slippery the decks of the cars, or how great the peril, is a species of inhumanity that should not be tolerated among civilized people. Human life is too sacred a thing to be so trifled with, and put in the balance against a few dollars and cents. There is really no more necessity for continuing the present practice of using hand brakes on top of freight cars, than there is for putting men on the tops of passenger trains. At Buffalo during the car-coupler trial it was the unanimous opinion of every master car builder who was conversed with upon the subject, that it was only a question of time when all freight cars would be equipped with some automatic or power brake, as are passenger cars. It was also the invariably expressed opinion that railway companies could not afford to do without them. "Time," it was said, "is now a very important factor in the competition for freight trafic." Freight trains must be run on much quicker time than in the past, but this could not be done with safety, only as the cars were equipped with some kind of brake, to which the power of the engine could be applied. Still with all these admissions by railway men, the desired improvements will be long delayed, unless legislation shall limit the time when this danger to train men must cease.

From and after some specified date, *and that in the very near future*, every freight car should be equipped with some kind of an automatic or power

brake, and a heavy penalty imposed on any company which compelled its men to use a brake that exposed them to the danger inevitably consequent upon the use of the hand brake now common. Since writing the above the Commissioners have had occasion to investigate a serious accident occurring on the Burlington, Cedar Rapids & Northern Railway on the night of the 30th of October, 1885. A wild freight train loaded with stock was ordered to make not less than an average of twenty-five miles an hour from Albert Lea to Cedar Rapids. The accident occurred at Northwood, Worth county. From the "speed record sheet" it appears that the train made an average of thirty-two miles an hour from Albert Lea to the place where the accident occurred. The engine left the rails at the first switch coming south at the station. The speed at this point was nearly twenty miles an hour. Had the cars been equipped with brakes under the control of the engine, the speed could have been checked down to that demanded by the rules of the company—namely, six to eight miles an hour in passing switches and stations. As it was, the heavy train consisting of twenty-seven cars was not under proper control, because of the inability to keep control at all times by hand brakes, where trains are required to run at such high rates of speed. Here two lives are sacrificed; two young men, the engineer and one of the brakemen, were instantly killed, and the fireman badly scalded, a great amount of property destroyed, some twenty-seven cattle killed and others injured. The loss of property in this one accident would, if it could have been saved, go far toward equipping the company's cars with some kind of automatic brake. *Between the values of the lives of these two young men and the cost of the brakes by which in all probability they could have been saved, there can be instituted no comparison.* No general manager, no president or superintendent of a railway company, no stockholder or director would for any sum of money risk his life as these brakemen hourly and daily risk theirs. To them life is just as dear, and just as important to their families as are the lives of the former. The fact that trains of cars are run with almost perfect safety to trainmen, because of the use of air and other automatic brakes, and this other fact that with the use of the common hand brake there is every year a fearful loss of life, as well as of property, and a great amount of suffering—these facts we repeat, are sufficient to warrant legislation that will require railway companies to adopt such appliances as will prevent this loss of life and property, or rest under a heavy responsibility for the same. We as Commissioners, cognizant of these facts, under oath to do our duty to all parties interested, most earnestly call the attention of the law making power to this unnecessary loss of life, and plainly ask if the public will hold the legislature blameless, unless it promptly provides against the further continuance of this great wrong.

The Commissioners report the following as the railroad accidents occurring in Iowa, for the year ending June 30, 1886:

During the year *one hundred and thirty-one persons were killed* on the roads in the State. Of these eight were passengers, sixty-one employes, and

sixty-two others not connected with the operating of the roads. Three were killed by derailments, eight by collisions, five caught in frogs, twenty-five fell from trains, sixteen getting on and off trains while in motion, five at highway crossings, twenty-seven from miscellaneous causes, four while stealing rides, two while intoxicated, twenty-six trespassing on track and one suicide.

There were *four hundred and forty-five persons injured during the year.* Of thirty-five were passengers, three hundred and thirty-six employes and seventy-four others. Twenty-eight were injured by derailments, twenty-eight by collisions, six were caught in frogs, thirty-eight fell from trains, forty-five getting on and off cars, seven at highway crossings, one hundred and thirty-six from miscellaneous causes, two from over-head obstructions, eight from stealing rides, nineteen from trespassing on track, two while intoxicated.

The number killed is twenty-five less than reported the previous year. number injured is four hundred and thirty less.

There were three killed and twenty-eight injured by derailments; there were eight killed and twenty-eight injured by collisions; there were five killed and six injured by being caught in frogs.

There were ten persons killed and one hundred and twenty-six persons injured coupling cars. Last year the Commissioners called attention to the action of the legislature of Massachusetts in 1884, and of Michigan in 1885, on this subject. As legislative action on this subject in Iowa is conservative and wisely so, they simply append the list of casualties from this cause since reports were made to them:

In 1878, there were killed, coupling cars	17
In 1878, there were injured, coupling cars	70
In 1879, there were killed, coupling cars	14
In 1879, there were injured, coupling cars	55
In 1880, there were killed, coupling cars	17
In 1880, there were injured, coupling cars	87
In 1881, there were killed, coupling cars	20
In 1881, there were injured, coupling cars	64
In 1882, there were killed, coupling cars	16
In 1882, there were injured, coupling cars	182
In 1883, there were killed, coupling cars	16
In 1883, there were injured, coupling cars	98
In 1884, there were killed, coupling cars	8
In 1884, there were injured, coupling cars	109
In 1885, there were killed, coupling cars	13
In 1885, there were injured, coupling cars	174
In 1886, there were killed, coupling cars	10
In 1886, there were injured, coupling cars	126

Since the creation of this Board in 1878 there have been killed in coupling cars, one hundred and thirty-one persons; and injured, nine hundred and sixty-five. It would seem that no effort should be spared to find some method by which these casualties could be avoided.

As a result of the remarkable tests made at Burlington in this State in July last, by National Master Car Builders' Association, the Commissioners strongly urge the adoption of an automatic or power-brake and an automatic coupler.

Touching this matter, the New York Legislature passed in 1884, the following law (section 4, chapter 39), which seems to be a remarkable and commendable step toward the protection of railroad employes :

After July 1, 1886, no couplers shall be placed upon any new freight car to be built or purchased for use, in whole or in part, upon any steam railroad in this State, unless the same can be coupled and uncoupled automatically without the necessity of having a person guide the link, lift the pin by hand, or go between the cars. The corporation, person or persons operating said railroad, and violating the provisions of this section, shall be liable to a penalty of not exceeding one hundred dollars for each offense.

WALKING ON TRACK.

A reference to the above report will also show the danger, if not criminality of trespassing upon the railroad tracks—using them as public highways. Twenty-six deaths and nineteen injuries for the year were reported ! During the nine years that reports were made to the Board of Commissioners two hundred and fifty three persons were killed and one hundred and sixty-eight injured while walking upon the railroad tracks within the State of Iowa ! The general law of trespass is not sufficient to break up this practice.

The law wisely prohibits, under severe penalties, the getting on and off moving trains, thereby doubtless greatly lessening, though not entirely preventing as yet, loss of life and injury thereby. It should go still farther, and prohibit the practice of using railroad tracks as public highways. Many valuable lives would be saved thereby.

The State Board of Health cannot too strongly endorse and commend these strong, wise and humane utterances of the Board of Railroad Commissioners upon this subject. Such a loss of valuable lives and such wholesale maiming from avoidable causes is little, if at all, less than criminal. It is hoped that the Legislature will, if possible, enact such laws as will in the future provide greater safety to the railroad employes of the State.

KEROSENE OIL.

Since the last report a change in the law for the inspection of kerosene oil has been made. That portion of the law regarding inspection in tanks has been repealed, and the standard raised five degrees. New rules for the government of inspection have been made. The people of Iowa may now congratulate themselves upon being as safely protected against accident from kerosene oil as those of any other State in the Union, both in their homes and in the railroad car. No legislation, however stringent, can protect against carelessness and negligence in the use of products of petroleum. Naptha, the dangerous property of petroleum, is really more dangerous than gunpowder. Gunpowder is a passive agent, while naptha is an active agent. Gunpowder will not explode unless fire is applied to it, while naptha being exceedingly volatile, sends out a vapor which will ignite at long distances. It has been the purpose of the law to secure the removal of so much of naptha from petroleum as to make it safe for household purposes without detracting from its illuminating quality. Its use demands intelligence and proper care.

The greatest danger from the use of kerosene is of explosion because of the breaking of the lamp-chimney, which causes the wick-tube to become greatly heated, and the vapor chamber, or upper part of the chamber of the lamp to become filled with vapor of oil, which becomes very explosive on mixing in certain proportions with ordinary air. A common lamp, partly filled with oil of Iowa legal test, is, under ordinary circumstances, in a co .dition liable to explosion in ten to fifteen minutes after its chimney has been removed, or broken so that it falls away from the lamp.

The following rules should be rigidly observed in the use of ordinary kerosene lamps :

LAMPS.

1. That portion of the wick which is in the oil reservoir should be enclosed in a tube of thin sheet-metal, open at the bottom, or in a cylinder of fine wire gauze, such as is used in miner's safety-lamps (28 meshes to the inch).

2. The oil reservoir should be of metal, and not china nor glass.
3. The oil reservoir should have no feeding-place or opening, other than that into which the upper part of the lamp is screwed.
4. Every lamp should have a proper extinguishing apparatus.
5. Every lamp should have a broad, heavy base.

WICKS.

1. Should be soft, and not tighly pleated.
2. Should be dried at the fire before being put into the lamps.
3. Should be long enough to reach only to the bottom of the oil reservoir.
4. Should be so wide that they quite fill the wick-tube without being squeezed into it.
5. Should be soaked in oil before being lighted.

MANAGEMENT.

1. The reservoir should be quite filled with oil every time before using the lamp. It should never be filled when the wick is burning.
2. The lamp should be kept thoroughly clean. All oil should be carefully wiped off, and all charred wick and dirt removed before lighting.
3. When the lamp is lighted, the wick should be first turned down, and then slowly raised.
4. Lamps which have no extinguishing apparatus should be put out as follows: Turn the wick down until there is only a small flickering flame, then give a sharp puff of breath *across* the top of the chimney, never *down* the chimney.
5. Cars or vessels used for oil should be free from water and dirt, and kept thoroughly closed.

It may be further added that no legislation will secure protection against the suicidal use of kerosene to start a fire in the kitchen stove.

It is proper here to caution the people against the use of all patent and secret processes for using naptha, gasoline and benzine, pretending to render them non-explosive. It is impossible to make gasoline, naptha or benzine safe by anything that can be made to it. Large numbers of so-called safety-lamps have been invented to burn naptha without danger. No lamp is safe with dangerous oil, and every lamp is safe with safe oil. The so-called safety lamp is objectionable because it leads to the use of dangerous oil. The use of naptha, gasoline or benzine for illuminating purposes in this State is forbidden. The State of Iowa is now supplied by refiners with oil for illuminating purposes which meets the requirements of the statutes and the rules of the State Board.

The following correspondence will explain itself:

IOWA STATE BOARD OF HEALTH,
SECRETARY'S OFFICE, January 27, 1887.

Wm. Larrabee, Governor:

John W. Blanchard, State Oil Inspector, has notified this office that he has inspected and rejected several barrels of oil used in lamps and lanterns of conductors and brakemen of passenger coaches, and forbidden the use of the same by the railroad company, the test showing oil burned at 180 degrees. He appeals to the State Board of Health and to this office. The opinion of the Attorney-General is, therefore, requested as to whether or not the provision of section 10, chapter 185, laws of the Twentieth General Assembly, apply to oil burned in lantern lamps of conductors and brakemen on all passenger trains, or head-light lamps on locomotives, or passenger trains, or cars of freight trains, on which passengers are carried; and whether or not oil so used should be of the same quality and standard, that is, as safe oil as that used in the lamps for lighting coaches? An early answer is requested that the rights of the parties may be speedily determined.

J. F. KENNEDY, M. D.,
Secretary.

STATE OF IOWA, EXECUTIVE OFFICE,
DES MOINES, January 25, 1887.

Hon. A. J. Baker, Attorney-General:

DEAR SIR—Under instructions from the Governor, I herewith transmit a copy of a letter from Dr. J. F. Kennedy, Secretary of the State Board of Health, which is self-explaining.

The Governor will thank you to communicate to him your official opinion on the question submitted.

Very respectfully,

(Signed.) FRED'K W. HOSSFELD,
Private Secretary.

DES MOINES, January 27, 1887.

Hon. Wm. Larrabee, Governor:

SIR—Answering yours of 25th inst., I would say that under section 10, chapter 185, laws Twentieth General Assembly, it is unlawful to use in any lamp on a passenger train such oil as is forbidden to be used by the provisions of said section. I cannot see any room for construction. The language is clear, plain and explicit and the prohibition general.

I have the honor to be with respect,

Yours truly,

A. J. BAKER,
Attorney-General.

CHICAGO, ROCK ISLAND & PACIFIC RY.,
OFFICE OF SUPT. IOWA AND K. & D. M. DIVS.
DES MOINES, March 26, 1887.

Dr. J. F. Kennedy, Secy. State Board of Health:

DEAR SIR—Please investigate and reconcile the discrepany in the opinion of the Attorney-General to Governor Larrabee, dated January 27, 1887,—in reply to the inquiry made by your Board.

Your inquiry referred to "lanterns;" the opinion to "lamps."

This company desires to have the whole question as to lamps, lanterns and oils used therein, settled definitely.

The safety of our trains and the lives of our passengers and employes imperatively demand that we burn in signal lanterns used by trainmen, also in red signal lights on rear end of trains, an oil that will burn brightly and positively not congeal at a temperature twenty-five to thirty degrees Fahrenheit below zero, and we do not believe such an oil can be obtained that will also stand a "burning test" of not less than 300 degrees Fehrenheit above zero.

An early reply will greatly oblige

Yours truly,

JOHN GIVIN,
Superintendent.

The subject of kerosene oil having been delegated to Mr. Andrews, Assistant Secretary, who has given it extended and thorough study, investigation was at once made, upon the statements set forth in the communication from Mr. Given, which had been supplemented by similar communications from nearly all railroads in the State. It was found that so-called Signal Oil had a burning point of about 180° F.; that it was used only for switch and signal lights about the yards, and in lanterns of station and train men; that for these uses its burning point was as high as could be required with safety against congealment in extreme cold weather; that it was composed of lard and kerosene; that to test it at a burning point of 300° F. and brand it as rejected for illuminating purposes, was manifestly unjust, as it thereby condemned it for sale or use for any purpose in this State.

Upon this point Mr. Thomson McGowan, superintending chemist of the Standard Oil Company, communicated the following:

CLEVELAND, OHIO, April 11, 1887.

L. F. Andrews, Esq., Assistant Secretary State Board of Health, Des Moines, Iowa:

DEAR SIR—Referring to contents of your letter of March 12, I have seen copy of eleventh report of State Board of Minnesota. Dr. Hewitt's idea of

judging the temperature of oils in lamp bowls from the temperature of the brass ferule of the lamp does not seem to me to be correct. I prefer to follow the plan of Prof. Chandler, and determine the actual temperature of the oil. Dr. Hewitt is also at variance with the best authorities East and in Great Britain and on the Continent of Europe, as to what is requisite if the safest oil that is practicable is to be secured. Had the doctor been familiar with the constituents of the common oils, Prime White, P. W. Headlight that he mentions, he would not have made the comparison he embodies in his report. I do not agree with him as to the necessity for 120 flash. Experience during the past four years has shown that the ratio of accidents in Wisconsin, where is used an oil burning at 120° Fah. in the open Tagliabue cup—flashing at about 78° in your cup—is not greater in proportion to population than in Michigan, Minnesota or Iowa. The doctor fails to take into consideration the fact that an oil which flows freely and easily up a lamp wick acts as a cooler, does not char the wick, and does not heat the oil in the lamp bowl as does an oil which moves slowly, clogs the wick, and quickly loading it up, soon chars it. An experience of twenty-one years has brought me to the conclusion that were our people to use an oil having a vaporizing point of 100, they would have an illuminator that would give satisfaction—one that would not produce more accidents than we find comes from the use of the higher tests, and one that would be cheaper.

Referring to your letter of 24th, I find that Signal oil has always been made to stand a fire test of 200°, and not 300°. The trade found no use for a 300° oil for signal purposes, inasmuch, as a rule, it would not burn with a common wick in a lantern. It was not intended to be used as a common illuminator, in the usual acceptation of that word, but in target lights, for brakesmen, lanterns, and in the signal lanterns that are placed on the rear platform of trains. It is possible to make this oil 300° test, so that it could be burned in lanterns, provided a different burner and wick were used. I do not think a successful use could be made of 300° oil in a lantern with the burner and wick found in lanterns. An oil of that test would also congeal at the temperatures it would encounter in winter in your State. I have given this subject considerable thought, and it seems to me that it was not the purpose of your Legislature to require an oil, such as the Signal, and used as the Signal is, to be of 300° test. The strictest interpretation of your law could only require its use on *passenger* trains; and then it is only used, if, indeed, it is at all, on such trains, in the lanterns of the brakemen and in the lanterns on the rear car of a train. This would limit its consumption so that it would amount to but a very small quantity in the entire State. In fact, ten to twenty barrels would about cover this consumption. In other States where 300° oil is used on passenger trains, steamboats, etc., no inspection is required for this Signal oil, for it is not regarded as an oil which is used at times or places where life would be endangered.

Very truly yours,

THOMSON MCGOWAN.

On the 1st of April the following order was issued:

IOWA STATE BOARD OF HEALTH,
OFFICE OF THE SECRETARY,
DES MOINES, April 1, 1887.

John Blanchard, State Oil Inspector:

DEAR SIR—In accordance with a recent expressed opinion of the Attorney-General, it has been decided that so-called "signal oil" be hereafter inspected for "flash-test" only. You are therefore respectfully requested to so instruct your deputy inspectors.

Yours respectfully,
J. F. KENNEDY, M. D.,
Secretary.

The following order was also issued regarding the inspection of oil used for illuminating railroad coaches:

STATE BOARD OF HEALTH,
SECRETARY'S OFFICE, June 11, 1887.

To Oil Inspectors in the State of Iowa:

It is hereby ordered that in inspecting oil to be used for illuminating railroad cars, when the burning point is 300° F., or below, the same shall be branded "Rejected for Illuminating Cars, ...Degrees." If the burning point is above 300° F., the same shall be branded "Approved for Illuminating Railroad Cars, ...Degrees," giving the number of degrees of the burning point in each case as the same may be. Inspectors must at once provide the necessary stencil plates for this purpose.

J. F. KENNEDY, M. D.,
Secretary.

During the investigation, it was disclosed that a large proportion of the oil used by railroad companies for lighting coaches was a brand known as "Mineral Seal," and in accordance with the methods of testing by the manufacturers was known to the trade as 300° oil. It would not pass the test required in this State, and was generally rejected, thereby causing trouble and disaffection among consumers. After much correspondence the manufacturers agreed to make an oil for use in this State which would pass inspection, to be known as "Iowa Railroad Oil."

It is now believed that Iowa is well guarded at all points against dangerous illuminating oil.

SMALL-POX.

During the biennial period but three outbreaks of small-pox have occurred in the State. The first and most serious was an importation. The second was, by prompt and efficient action of the local board, confined to the single original case. The following is a history of the case, which is given for the benefit of local boards that they may more fully understand their duty in the premises, and the necessity for prompt and vigilant action.

IN WORTH COUNTY.

NORTHWOOD, July 9, 1886.

State Board of Health:

I am instructed to inform you that there are three or more cases of small-pox one mile south of Bolan, in this, Worth county. There have been a number of persons exposed already, and something should be done at once to stop further exposures.

D. S. MORE, M. D.

BOLAN, July 9, 1686.

State Board of Health, Des Moines:

Case of small-pox in Barton township, Worth county.

J. R. SMITH,
Township Clerk.

DES MOINES, July 10, 1886.

J. R. Smith, Township Clerk, Bolan, Worth county, Iowa:

Establish vigorous quarantine of all small-pox cases and exposed persons, and order and enforce general vaccination, to prevent spread of disease, and obey rules of State Board.

J. F. KENNEDY, M. D.,
Secretary State Board of Health.

BOLAN, July 10, 1886.

Secretary State Board of Health:

Five cases of small-pox; ten or fifteen exposed persons refuse to obey trustees. Advise immediately.

BOARD OF TRUSTEES.

On receipt of the last telegram, Assistant Secretary Andrews went to Borlan. A meeting of the local Board was called, at which all the members were present. There was an earnest desire manifested to do all that was necessary to get rid of the scourge, but they did not know what to do. They were further embarrassed by the interference of pretended physicians who pronounced the disease not small-pox, and advised resistance to all orders of the local board. The board were instructed as to their duties and authority in the matter, and they were charged with the importance of fulfilling them, which were cordially accepted. Dr. C. W. Sanders, of Manly, was elected health officer, and measures at once inaugurated for a vigorous effort to stamp out the disease. The citizens of Manly refused to allow Dr. Sanders to visit the infected district and return to their midst. Dr. Kean, of Northwood, therefore consented to attend the sick, but failed to go, when the local board wired the following:

BOLAN, July 14.

Secretary State Board of Health:

Telegraphed Kean last night to come; also this morning. No answer. Patients call for physician without choice. Please appoint one.

BOARD OF TRUSTEES.

The following was at once wired to Dr. Sanders:

DES MOINES, July 14.

Dr. C. W. Sanders, Manly Junction:

Dr. Kean declines to attend patients. At request of Barton Township Trustees you are hereby directed by this office to attend small-pox cases in that township. Further directions by mail.

J. F. KENNEDY, M. D.,
Secretary State Board of Health.

OFFICE OF THE STATE BOARD OF HEALTH,
DES MOINES, July 14, 1886.

C. W. Sanders, M. D.:

The trustees of Barton township wired this office to-day that they were unable to get Dr. Kean to attend the family one mile east of the patients you went to see. Accordingly a dispatch was sent you to attend them. This you can do without danger to your community. Get the German preacher to go there and remain with the sick. Very little medicine, you are aware, is necessary. The most important service is nursing. That he can render. This matter you will have to attend to. It is an emergency

which cannot be put off or escaped. It must be attended to vigorously at once. The weather is favorable—houses open and plenty of outer air. Get a record of all cases, and of vaccinated and unvaccinated persons and report to this office. Also if there has been vaccination after exposure, and report to this office. We desire to know if vaccination is a protection. A physician who refuses to act in such an emergency without valid reason, should have his certificate revoked. No people should be exposed to neglect and death without an effort to help them. Your community need not be alarmed if you attend those sick persons if you exercise proper precaution. Vaccinate your own people generally. If the further presence of any one from this office is needed notify by wire and response will be promptly made.

J. F. KENNEDY, M. D.,
Secretary.

SHERIFF'S OFFICE,
NORTHWOOD, IOWA, July 24, 1886.

To the Board of Health:

I wish to say to the State Board of Health that I have been called to assist the local Board of Health of Barton township, and that I believe they are doing right. The public is protected, and the sick well cared for. You could not have appointed a more able and efficient man than Dr. C. W. Sanders. You can be assured that everything will be well and properly managed while in his charge.

H. B. CORNICK,
Sheriff of Worth county, Iowa.

MASON CITY, IOWA, July 15, 1886.

State Board of Health of Iowa:

I have just returned from the small-pox district in Worth county. I find *four cases* of the *pure, unadulterated* kind. There are four *small* children at one house which have not been vaccinated, and one of them just beginning to *show eruption*. The others will, no doubt, come down between now and Sunday. There are some *six families* now that have been exposed in different houses in *Union* and *Barton* townships. What is to be done? Yours in haste.

Very respectfully, A. A. NOYES, M. D.

BOLAN, IOWA, July 24, 1886.

J. F. Kennedy, M. D., Secretary of State Board of Health:

The person bringing the disease here is Mrs. Fredrica Detrich, who, with her husband and four children, embarked May 11, 1886, from Liverpool, on board British Prince, of the Trans-Atlantic Steamship Line; voyage, thirteen days. Landed at Philadelphia May 24th, and started immediately for this place, arriving at Grafton Friday noon, May 29th. June 6th, the lady mentioned was taken sick; two days later, the old man, Christian Detrich, was sick, but it was only varioloid, and mild. Frank Detrich, aged 19,

varioloid attack June 25; mild. Eda and Maggie Detrich, at respectively two and five years; the latter light, discreet; the other, confluent.

Mrs. Clarinda Brown, age 26 years; attack, July 3d; discreet.

Harmon Brown, aged 1 year; attack July 5th; discreet.

Henry Brown, age 6 years; attack appeared July 21st; confluent small-pox.

Emil Brown, age 4 years; attack appeared July 20th; discreet form.

Laura Brown, age 2 years; confluent type; patients all seem to be doing well.

Quarantine well enforced. Three have been fined. No more trouble. All patients doing well. Vaccinations, as a rule, working well. I have good nurses, and good will of the sick people.

In regard to the Detrich family I cannot depend much on what they say. I now suspect there is no such vessel as British Prince. The purchaser's contract, signed by Henry Tewbins, of St. Ansgar, Ia., calls for passage by the Trans-Atlantic line, but the port of arrival was Philadelphia, and I think the Trans-Atlantic would land them at New York. They say they were not detained in port at all.

C. W. SANDERS, M. D.

MASON CITY, IOWA, Aug. 1, 1886.

State Board of Health, Des Moines, Iowa:

I desire to drop you a line at this time in regard to a report here to-day and last night, that there are some five more cases of small-pox off in another part of Worth county, adjoining Winnebago county, southwest corner. One death is reported—another emigrant from the *same steamer* that Mrs. Dietrich came over on.

Respectfully yours,

A. A. NOYES.

On the 7th of August, Dr. J. R. Jones, of Fertile, in Worth county, confirmed the report of Dr. Noyes, to wit:

As near as I can find out, there has been ten cases of small-pox and several exposures. Discovered July 28th, two families in Grant township, Cerro Gordo county; two families in Ellington township, Hancock county. These are adjoining townships. The first appearance was on a girl who had just arrived from Norway. The second case appeared July 4th, but up to July 28th no medical aid was called. All are now quarantined. There has been but two deaths and fourteen cases.

On the 10th of August, E. C. Abbey, clerk of Ellington township, wrote the State Board, to-wit:

GARNER, HANCOCK CO., IOWA, Aug. 10, 1886.

To the State Board of Health:

DEAR SIRS—There are or have been eight small-pox cases in Ellington township, Hancock county, two of which proved fatal; the others are on the mend. The Board of Health of this township have taken proper measures to quarantine all persons exposed or infected.

E. C. ABBEY,
Clerk.

On the 14th of August, John Cobb, clerk of Grant township, reported six cases of small-pox and several exposures. There were no deaths. Vigorous quarantine measures were adopted, and the disease quickly eradicated. The disease was brought there by a Norwegian emigrant girl.

MANLY, IOWA, Sept. 6, 1886.

J. F. Kennedy, M. D., Sec'y State Board Health, Des Moines, Iowa:

DEAR SIR—I wish to inform you that I am through with small-pox in Worth county for the present. Have destroyed all dangerous clothing, bedding, etc. Have followed the advice of the State Board in every particular regarding disinfection. The quarantine is now raised and everything goes on as usual. There were no new cases after my report of July 24th. All except the little girl, Laura Brown, who died really from cholera infantum, have made a fair recovery. Vaccination was here, so far as known, a perfect protection, even myself, though I had to be nurse one week, yet suffered no symptoms of the disease.

C. W. SANDERS, M. D.,
Health Officer.

FERTILE IOWA, Oct. 18, 1886.

Iowa State Board of Health:

I herewith send notice that the quarantine is now raised, caused by the small-pox in Grant township, Cerro Gordo county. Quarantine had been in force seventy-six days.

It was brought here by emigrants from Norway, who came on the steamer Oregon, of the Dominion Line, landed at Quebec May 24th, 1886, and came direct to this township. The eruption made its appearance first on the 13th day of June. The parties received no medical treatment until the 28th of July, and did not know what it was up to that time. I was called to see one man living in Hancock county, adjoining Grant township. I was told that he had chicken-pox. I found small-pox in the confluent form. It had been in the neighborhood some six weeks. Quarantine was established August 3d. There were nineteen cases as near as I can find out, most of which not receive medical treatment. Only two (2) deaths; neither one vaccinated.

The quarantine was a complete success. Two houses were burned entire, and all other goods thought to be dangerous. None took the disease that had been recently vaccinated.

J. R. JONES, M. D.,
Health officer.

IOWA STATE BOARD OF HEALTH,
OFFICE OF SECRETARY, July 28, 1886.

Benjamin Lee, M. D., Secretary Pennsylvania State Board of Health:

We have in Worth county, this State, an outbreak of small-pox which was imported direct from your city. I will give you the facts as reported by the local health officer, and would be pleased to have you trace the matter up in Philadelphia, for if it be as alleged, it is a serious business and should be stopped:

Mrs. Frederika Deitrick, a German woman, arrived at Philadelphia on the steamer "Black Prince," of the Trans.-Atlantic Line, May 24th, and the same day left Philadelphia by rail, arriving at Barton township, Worth county, Iowa, Friday noon, May 29th. June 6th she developed variola. Two days later her husband, who came with her, was taken sick, and a few days later their four children. They left Liverpool May 14th, and were thirteen days making the trip. They state that small-pox prevailed on the ship and no attempt was made to quarantine, or for inspection. If so, it is quite important that your health authorities should give the matter attention, and that such gross outrages as turning loose upon the public persons infected with contagious diseases should be punished.

This is the second time Iowa has been scourged by importation, once through Baltimore, when we had thirty-seven cases and a large number of deaths. We have at the present time fifteen cases, with a large number of exposures.

Yours truly,

L. F. ANDREWS,
Assistant Secretary.

COMMONWEALTH OF PENNSYLVANIA,
STATE BOARD OF HEALTH,
PHILADELPHIA, August 2, 1886.

L F. Andrews, Assistant Secretary:

DEAR SIR—Accept my thanks for the information contained in your favor of July 28th, in reference to cases of small-pox trouble in this city, and occurring in your State. It will be of great service to me in an effort I am about to make to secure a more effective quarantine service for this port. I am quite confident that an epidemic of eleven cases in the interior of this State was caused by emigrants on the same ship that you refer to, but I was unable to trace it directly. The vessel was the "British Prince." No cases occurred in this city, but the passengers, with their effects were very improperly permitted to pass through to the West. Our board will use its best efforts to make our quarantine of the Delaware protective, not only for the city of Philadelphia, but as it should be, for the entire country.

Yours very truly,

BENJAMIN LEE,
Secretary.

IN WOODBURY COUNTY.

WOODBURN, June 4, 1886.

Secretary State Board of Health:

Small-pox eight miles east of here. People passing. What shall I do? Answer.

M. T. MARTIN,
Health Officer.

SECRETARY'S OFFICE, STATE BOARD OF HEALTH,
DES MOINES, June 4, 1886.

Dr. M. T. Martin, Health Officer, Woodburn, Iowa:

Quarantine premises strictly, and vaccinate all recently exposed persons and all unvaccinated persons.

J. F. KENNEDY, M. D.,
Secretary.

The following was sent by mail:

SECRETARY'S OFFICE, STATE BOARD OF HEALTH,
DES MOINES, June 4, 1886.

M. T. Martin, M. D., Health Officer:

DEAR DR.—Will you please investigate and ascertain the source of the outbreak of small-pox reported by you, and give a history of it? Also of all vaccinated and unvaccinated persons, and the result of vaccination after exposure; and whether or not there have been cases of protection by vaccination after exposure, to show prophylactic effect of vaccination.

Use vigorous measures to stamp out the disease. Do not permit it to spread. Establish quarantine and arrest all persons violating it. If you do so, you will soon get rid of it with no further trouble. Let the people know what is required, and they will act more intelligently. With prompt and general vaccination everybody can go about their business, of course, with strict isolation of all infected persons.

Yours truly,

J. F. KENNEDY, M. D.,
Secretary.

This outbreak was confined to this single case, and speedy recovery was had.

In July a case was reported by Dr. C. W. Lowry, Health officer at Grand Junction. There was prompt isolation by removing the patient to small temporary pest-house nearly a mile from town. The recovery was speedy, with no other cases.

IN JOHNSON COUNTY.

IOWA CITY, October 18, 1886.

J. F. Kennedy, M. D., Secretary Iowa State Board of Health:

DEAR DOCTOR—I was notified to-day of the presence of small-pox at Coralville, in this county. I took with me the Health officer of this city and we went to Coralville and looked up the patients.

James Johnston. Resides in Coralville. Came from Denmark to New York on steamer "Tinwaller" or Tin Valley, a month since. Says, there was "some sickness like this on the boat." Came from Wilton, Iowa, where she was visiting friends September 7, 1886. Mrs. Johnston has evidently had varioloid, and her baby, perhaps eighteen months old, is now in the stage of scabbing; confluent variola on the face, and is doing well.

Another family, on adjoining lot, says their children have had the same disease. They, too, are Danes.

We saw Mayor Davis and directed rigid quarantine and isolation, which he promised to oversee.

Dr. R. W. Hill, Health officer of Iowa City, showed me the cases, and will furnish any further information as to further progress of cases, if desired.

W. S. ROBERTSON, *President.*

Unusual space is given these outbreaks—

1. To show the constant menace and exposure of the State to contagious diseases by importation.

2. To emphasize the importance of constant and thoroughly organized and equipped local boards to combat and eradicate a contagious disease at the very outset of its appearance.

SCARLET FEVER BY IMPORTATION.

In May, 1886, notice was received that scarlet fever had appeared at Marcus, in a family of immigrants recently arrived from Liverpool, and the indications were it was a case of importation of the disease. Dr. Maxey, Health officer, was requested to ascertain and furnish the facts. The following is a history of the case:

MARCUS, IOWA, May 25, 1886.

Secretary State Board of Health, Des Moines, Iowa:

DEAR SIR—Your letter relative to emigrants and scarlet fever patients

received. I have endeavored to obtain the information required, but have failed in part, viz., name of vessel.

The husband had been here twelve months or more, and earned money enough to bring his family over, and they came to him. The mother being timid and ignorant, she could not give name of boat, but gave the following data:

Anna Rehsen, the wife.
Margaret Rehsen, child, 6 years old.
Johannah Rehsen, child, 4 years old.
Frederick Rehsen, child, 3 years old.
Anna Rehsen, child, 1 year old.

Left Hamburg, Prussia, about April 10, 1886. Landed at Baltimore, Md., May 4th. The vessel was of Inman line. The railroad agent here sold the ticket for Inman line, to husband. I asked for stub of ticket. He said it was destroyed and could not be found.

The mother states that there were many children on the vessel, sick, like their children, and that the officers of vessel did not try to prevent the mingling of children with sick ones.

This afflicted family arrived here on the 7th of May, and the children were sick within twenty-four hours after arrival.

One patient will lose sight of right eye by abscess of cornea. There is also abscess of left ear, that may prove fatal; otherwise all are doing well.

Respectfully yours,

W. C. MAXEY, M. D.

IOWA STATE BOARD OF HEALTH,
OFFICE OF THE SECRETARY, May 28, 1886.

James A. Steuart, Health Commissioner, Baltimore, Md.:

DEAR SIR—I desire to call your attention to another importation of contagious disease into this State through your port of entry, and if the facts are as alleged, it is a case demanding investigation, and that proper remedies be applied to prevent repetition.

On the 7th of May a family named Rehsen arrived at Marcus, in Cherokee county, consisting of Anna Rehsen and her four children. They left Hamburg, Prussia, April 10th, on a vessel of the Inman line, arrived at Baltimore May 4th. Within twenty-four hours after arriving at Marcus, the children were prostrated with scarlet fever. There were several exposures, and there has been several deaths.

The mother states there were several children sick on the vessel, like her children now, and no effort was made by the officers to keep the sick from the well.

Iowa has once been burdened with a severe attack of small-pox, imported through Baltimore and traceable directly to gross neglect of duty by officers of vessels landing immigrants there.

Can you furnish this office with any further information respecting this matter?

J. F. KENNEDY, M. D.,
Secretary.

HEALTH DEPARTMENT, CITY HALL,
BALTIMORE, June 5, 1886.

J. F. Kennedy, M. D., Secretary State Board of Health of Iowa:

DEAR DOCTOR—Your favor of the 28th of May was received in due course, and I have delayed reply in order to investigate the allegations of your letter. I have done so, and find that no steamship of the "Inman" line has ever been to Baltimore; that no person of the name of Rehsen appears on the list of passengers (of any class), of the N. German Lloyd's line or Allan line, which do come to Baltimore. I have had the lists examined before the 4th of May, and of that date, and find no such name. The quarantine physician at the port of Baltimore has exercised the greatest care and vigilance, and has not this season detected a case of scarlet fever or small pox among the immigrants arriving at this port. There has been a good deal of measles and some diphtheria, all of which cases have been sent to hospital and detained until recovery. Your assertion that "Iowa has once been burdened with a severe attack of small-pox imported through Baltimore, and traceable directly to gross neglect of duty by officers of vessels landing immigrants there," is, as far as it refers to the quarantine and health officers of the port of Baltimore, utterly without foundation in fact, and cannot be substantiated. You are perhaps not aware that many immigrants arriving at New York, pass through Baltimore enroute to the west. If disease should develop amongst these after reaching their destination, surely Balitmore should not be blamed for it. Hoping, sir, that in the future you will accord to Baltimore the credit she deserves for watchfulness and care over her quarantine and sanitary regulations,

I remain very respectfully yours, etc.,

JAMES A. STEUART, M. D.,
Com. Health and Registrar.

IOWA STATE BOARD OF HEALTH, OFFICE OF THE SECRETARY,
DES MOINES, June 10, 1886.

W. C. Maxey, M. D., Marcus, Iowa:

DEAR DR.—Herewith is sent the you the reply of the Health Commissioner of Baltimore, to the scarlet fever matter. If you can establish the fact of the arrival of this family at Baltimore, I would like it. The family could hardly be so mistaken or ignorant as not to know on what vessel they came, and when and where they came on shore.

Please reply soon and return the letter, as I desire to reply to it, and give such further facts as you may elicit. The railroad agent ought to know something about it, if he sold the ticket, and how could he sell ticket from Hamburg to Iowa.

Yours truly,

J. F. KENNEDY, M. D.,
Secretary.

STATE OF IOWA, } ss.
CHEROKEE COUNTY }

I, Anna Ruhsen, being duly sworn, depose and say that I am twenty-six years of age; that I am a resident of Cherokee county, and State of Iowa. That on the 9th day of April, A. D. 1886, I took passage at Hamburg, in Germany, on a steam vessel for the city of Baltimore, in the State of Maryland; that a sickness prevailed among the children aboard the ship during the passage; that on my passage between said ports I was accompanied by my four children; that we arrived at Baltimore on the 28th day of April, 1886, at three o'clock P. M., and were immediately hurried from the vessel and placed on board a railroad train, without being allowed time to procure food; that on the 2d day of May, 1886, we arrived at Marcus, in Cherokee county, State of Iowa, where we have since resided; that on the 4th day of May, 1886, being the third day after my arrival at Marcus, my children were taken sick with a disease similar to that prevailing on shipboard as before mentioned, and which is said by the physicians here to be scarlet fever, and one of my children has died of said disease; that the name of the vessel in which I took passage is unknown to me, but that the same is one of the Allan line steamers; that the baggage check, attached hereto, and marked "A" on the upper right hand corner thereof, is the same given to me at Hamburg, in Germany, being printed on cloth and sewed with black thread across the middle. I would further state that my children were sick and complaining at the time of my arrival at Marcus, three days before we called a physician.

Witness my hand at Marcus, Iowa, this 14th day of June, 1886.

ANNA RUHSEN.

Subscribed in my presence, and sworn to before me this 14th day of June, 1886.

B. RADCLIFFE,
Notary Public.

[SEAL.]

EXHIBIT "A."

Allan [cut of steamer] Line.
Emigrant's Baggage.
Care Allan Brothers & Co.,
James Street, Liverpool.

HEALTH DEPARTMENT, CITY HALL,
BALTIMORE, July 22, 1886.

J. F. Kennedy, M. D., Secretary State Board of Health of Iowa:

DEAR DOCTOR—I have just received the enclosed, the S. S. Caspian of the Allan line, having just returned to this port.

I am satisfied that all due diligence has been and is exercised by the

officers of the Steam Ship Co., as well as by the examining officers on both sides of the ocean. With sincere regard,

I am very truly yours,

JAMES A. STEUART, M. D.,
Com. of Health and Registrar.

ALLAN STEAMSHIP LINE
BETWEEN BALTIMORE AND LIVERPOOL,
BALTIMORE, July 21, 1886.

Dr. James A. Steuart, Commissioner of Health, City:

DEAR SIR—Referring to a complaint made to the Iowa State Board of Health against our steamship "Caspian," as to the state of health of her passengers landed at Baltimore last April, we beg to enclose herewith a letter from Dr. de Mille, her surgeon, which explains itself. We also return the letter of Dr. Kennedy, of Des Moines, Iowa, and would say that it appears the Doctor jumped at a conclusion in this case too quickly, which we are sure he would not have done if the following facts had been in his possession, which we would thank you to communicate to him:

The emigrants of the "Caspian," as well as those of all other steamers of the line, have to pass a medical examination by government officers at Liverpool or Queenstown before being permitted to board the steamers; any one found to be afflicted with a contagious disease is of course rejected.

Our Allan steamers, coming all *via* St. Johns, N. F., and Halifax, N. S., on arrival at these ports again are examined by government quarantine officers as to the state of health of passengers and crew, and have to go through a similar examination on arrival at the port of Baltimore. If notwithstanding all these precautions emigrants after having landed are found to be afflicted with a contagious disease, the steamer certainly cannot be blamed for it, and the emigrants must have brought the germ with them. In the case of the "Caspian," no scarlet fever or measles developed among the passengers while at sea, and even if there had been sickness and death on board, nobody should blame the steamer or her officers, as a number of cases of sickness and death may reasonably be expected to occur among say five hundred people during an ocean voyage of twelve or fourteen days.

How unreliable is the statement of the complainant may be seen from the fact that she cites having sailed by an Allan Line Steamship from Hamburg to Baltimore, which is a mistake, she having embarked by the "Caspian" at Liverpool. The trip from Hamburg to Liverpool she made either by a steamboat direct, or by one of the North Sea boats to Hull, and thence by railway. There can be no question that the governments of Great Britain and Germany, as well as the managers of the steamship companies we represent, do everything in their power to prevent afflicted persons from embarking, and it is a mistake to suppose that the steamship companies and their agents do not use proper care in this connection, as it would ruin their

business if they should allow or wink at negligence in these particulars, thereby jeopardizing their reputation.

Very respectfully,

A. SCHUMACHER & Co.,
(W. G. HILKEN.)
General Agents Allan Line, North German Lloyd.

ALLAN STEAMSHIP LINE BETWEEN BALTIMORE AND LIVERPOOL,
BALTIMORE, July 21, 1886.

Messrs. Schumacher, & Co.:

GENTLEMEN—My attention has been called to a letter received by the State Board of Health, stating that cases of scarlet fever had occurred on the S. S. "Caspian" during her voyage from Liverpool, G. B., to Baltimore, U. S., April 13 to April 29, 1886.

In reply, I beg to state that no cases of scarlet fever or of any other contagious disease occurred on that voyage, and that the passengers were landed in Baltimore in good health.

All passengers on board were inspected by the medical officer of the Board of Emigration, at Liverpool, before sailing.

I am a graduate of the Halifax Medical College of Nova Scotia, and obtained my degree in 1882.

Yours very truly,

WM. BUDD DE MILLE, M. D., C. M.,
Surgeon in Charge R. M. S. Caspian.

POWERS OF THE STATE AND LOCAL BOARDS OF HEALTH.

A question having arisen as to the powers of the State Board, and of local boards, and their relations, one to the other, the following interrogatories were submitted by the Governor to the Attorney-General:

A. J. Baker, Attorney-General:

1. Has the State Board of Health, under the provisions of chapter 151, Laws of 1880, power and authority to make rules and regulations for the protection of the people against the spreading of infectious and contagious diseases?

2. If the State Board of Health has the power to make such rules and regulations, are they binding upon the people; and also upon local boards of health, when made and promulgated?

3. Does the discretionary power given to local boards in section 16 of said chapter, carry with it the power and authority of local boards to make rules and regulations in contravention of, or annulling regulations made by the State Board regarding "matters pertaining to quarantine," as provided in section 2 of said chapter?

4. Are the powers conferred upon the State Board of Health, in section 2 of said chapter, in contravention of the constitution of the State of Iowa?

5. Does the power so conferred in said section 2 come within the rule of the Supreme Court in *Wier v. Cram*, 37 Iowa, 649; 33 Iowa, 134?

6. Can the State delegate legislative power to inferior bodies, boards or commissions?

7. Are the following rules and regulations inconsistent with, or in contravention of, the powers given to the State Board of Health, in said chapter 151, or in contravention of the constitutional powers of the legislature?

"Upon notice being given of cases of scarlet fever to the board of health of a township, city or town, or to the health physician thereof, or whenever any member of said board, or the health physician shall have knowledge of any cases of scarlet fever within his jurisdiction, some member of the board or the health physician, shall cause a *yellow* cloth, or card having "scarlet fever" conspicuously printed thereon, not less than eighteen inches square, to be fastened upon the front door, or other conspicuous place of each building in which said sickness prevails, said cloth or card to be maintained during the existence of the disease, or until such time as the health physician is satisfied the premises have been properly cleaned, disinfected and purified. If said yellow cloth or card is removed, without authority from the health physician, the name of the person, or the head of the family occupying the premises, together with the number of the street, or location, shall be published, and the person removing said cloth or card, or causing their removal without authority of the health physician, shall forfeit a sum not less than twenty-five dollars.

Separation of the Sick from the Well.—Whenever a child has sore throat and fever, and especially when this is accompanied by a rash on the body, the child must be immediately isolated as completely as possible from other members of the household, and from other persons, until a physician has seen it and determined whether it has scarlet fever. All persons known to be sick with the disease must be promptly and thoroughly isolated from the public not less than thirty-five days.

The room in which one sick with this disease is placed, must have no carpet, or only pieces, or rugs; must previously be cleared of all needless clothing, drapery and other material likely to harbor the poison of the disease. Provision must be made for the introduction of a liberal supply of fresh air, without sensible currents or drafts.

Small pieces of rags should be substituted for handkerchiefs, and after once used, must be burned, immediately.

Body and Bed-clothing, etc.—It is *best* to burn all articles which have been

in contact with the persons sick with contagious and infectious diseases (and especially if the disease be small-pox). Articles too valuable to be destroyed, must be treated as follows:

Cotton, linen, flannels, blankets, etc., must immediately on removal from the body or bed, and before removal from the sick-room, be placed, piece by piece, in boiling water, and then boiled thirty minutes. If not so treated, they must immediately on removal from the sick or bed, be immersed in a corrosive sublimate solution, prepared by dissolving one ounce of corrosive sublimate in six gallons of water; let them remain two hours, then wring out and send to the wash. This solution must be kept in wood or earthen vessels, and not metal.

Heavy woolen clothing, silks, furs, stuffed bed-covers, beds, and other articles, which cannot be treated with the solution, must be hung in the room during fumigation, their surfaces thoroughly exposed, and pockets being turned inside out. Afterward they must be hung in the open air, beaten and shaken. Pillows, beds, stuffed mattresses, upholstered furniture, etc., must be cut open, the contents spread out and thoroughly fumigated. Carpets are best fumigated on the floor, but must afterward be removed to the open air and thoroughly beaten.

The discharges from the patient must be received into vessels containing "chloride of lime," or some other disinfectant, and if not buried at once, must be thrown into a cesspool, or a water closet, after having been thoroughly disinfected; but *never* into a running stream. All vessels must be kept scrupulously clean and disinfected.

Perfect cleanliness of nurses and attendants must be enjoined and secured. The hands must be freely disinfected, and frequently bathed in plain soap and water.

Funerals of those dying from scarlet fever must be strictly private and the corpse not exposed to view. To avoid mistakes *notices* of such deaths in the papers *must state* that the deceased died of scarlet fever. No form of scarlet fever is devoid of danger, for most serious results have followed the most simple cases.

After recovery from scarlet fever, and after thorough bathing under direction of the physician in charge, no person must be permitted to appear in public wearing the same clothing worn while sick with, or recovering from this disease.

After death, or recovery, of the sick, the room, furniture and other contents not to be destroyed, must be thoroughly disinfected. The paper on the walls and ceiling, if any there be, must be removed and completely burned. The floor, wood work and wooden furniture painted over with a solution made by dissolving one ounce of corrosive sublimate in six gallons of water; let the painting remain one hour, then remove by washing with clean water. The walls, if not papered, must be thoroughly scrubbed and whitewashed.

Fumigation.—When a room and its contents are to be disinfected by fumi-

gation, all articles therein must be so arranged as to expose the greatest amount of surface to the action of the disinfectant, *and all openings* to the room must be *closed tight*."

8. Is section 2 of said chapter mandatory upon public officers regardless of ordinances of a municipal corporation?

9. Where it is adjudicated by a local board of health that a nuisance exists, is it essential to the right of the board to cause the removal of such nuisance, and to enter premises therefor, that notice be previously given the owner of the premises?

OFFICE OF ATTORNEY-GENERAL,
DES MOINES, IA., Aug. 27, 1886.

Hon. William Larrabee, Governor:

SIR—I have the honor of acknowledging the receipt of your letter of the 21st inst., with accompanying papers.

From the numerous questions asked by the Secretary of the State Board of Health, I concluded that the Board desires my opinion as to the scope of their powers and duties, and the means of enforcing the same. I cannot well answer this by considering the questions *seriatim*, but will consider them in their general scope.

The State Board of Health is a creature of statute, and has only such powers and duties as are given to it by the laws of its creation. These powers and duties are defined by section 2, of Chapter 151, Laws of 1880, and are as follows:

First. The general supervision of the interest of the health and life of the citizens of the State.

Second. The Board has charge of all matters pertaining to quarantine.

Third. They are required to provide for and supervise a registration of marriages, births and deaths.

Fourth. They have authority to make such rules and regulations and such sanitary investigations as they may from time to time deem necessary for the improvement or preservation of the public health.

Fifth. It is the duty of all public officers, sheriffs, constables, and all other officers of the State, to enforce such rules and regulations—so far as the efficiency and success of the Board may depend upon their official co-operation.

The scope of the inquiry submitted to me includes the question of, *first*, "The constitutionality of the law in so far as it confers upon the Board the power to make such rules and regulations as the Board may deem necessary for the improvement or preservation of the public health."

I do not think there can be any question about the constitutionality of this provision. The legislature could not, in the nature of things, foresee all the contingencies that might arise, and provide therefor by fixed laws. If they could, then there would be no necessity for the creation of such a Board. Any rule or regulation of the Board, therefore, which is reasonable, will have all the effect of a law in respect to the subject matter included in the rule.

Second. "What power has the Board to enforce its rules?"

With the exception of that provision of the law in relation to the registration of marriages, births and deaths there is no penalty provided for a failure to comply with the rules and regulations of the Board. The Board has no authority to supply this by providing for such penalties or forfeitures. The legislative power of the State alone can do this.

The only method of enforcing the reasonable rules and regulations of the Board is by a resort to the courts in suits of *mandamus* or injunction.

The next general inquiry is with respect to the respective powers and jurisdiction of the State Board of Health and local boards.

The State Board has no supervisory jurisdiction over local boards. The local boards are required to make reports to the State Board at stated intervals, and also to make special reports when so required by the State Board. These reports are not, however, made for the purpose of conferring upon the State Board any authority to supervise or control the action of local boards. No such powers will be implied. The object, seemingly, is to enable the State Board to have such general information as is necessary to aid it in the exercise of its separate powers, and also to enable the State Board to make the reports to the General Assembly as required by the law. The local boards have more detailed powers and duties conferred upon them in respect to their localities than are conferred upon the State Board. And the law provides penalties and forfeitures for violations of the rules and regulations and orders of local boards. With respect to the enforcement of the rules and regulations of local boards the State Board has no powers or jurisdiction. The jurisdiction is by direct enactment conferred upon justices of the peace.

To the local board is entrusted the duty of local quarantine in cases of contagious diseases, and I am of opinion that in the discharge of these duties such local boards are not subject to any of the rules of the State Board.

The question is asked whether local boards can make rules and regulations annulling regulations of the State Board regarding matters of quarantine.

I think not, when the rules of the State Board are made in regard to matters over which it has exclusive control.

There is a seeming conflict between the provisions of section 2 and section 21, in regard to quarantine. This seeming conflict I think may, however, be reconciled, if we consider the purposes of the two sections.

As I understand section 21, it means that if the State Board of Health has reason to believe that a contagious or infectious disease or an epidemic is in existence in any particular locality of the State, it may quarantine against such locality, and provide for the inspection and examination of persons going from such infected locality to any other localities, and may make rules in regard to the transportation of persons or goods from such locality by means of the public highways of travel. Or, when such diseases exist in sister States or foreign lands, the State Board may establish general quarantine regulations against all persons coming into the State from such infected districts.

With respect, however, to the local quarantine and treatment of such dis-

eases as provided for by section 21, I think the local boards have the exclusive authority to act, and that the State Board can neither annul any of the regulations of local boards in respect thereto, or to require such local boards to enforce any of the rules of the State Board in the treatment of or management of the cases provided for by said section 21. In respect thereto the laws provide that such local boards "shall make effectual provision in the manner in which they shall judge best for the safety of the inhabitants."

I am asked for an opinion as to the legality of certain rules submitted with the papers transmitted to me by your excellency. If these rules are meant to apply to such quarantine regulations as the Board has authority to make, then I think they may be regarded as legitimate exercise of the authority conferred upon it, except that part which provides for a penalty of $25.00 for the violation thereof.

As before indicated, the Board has no authority to provide penalties or forfeitures. If they are meant to control local boards, when acting under the provisions of section 21, then, in my opinion, they are as to such local boards inoperative.

The local boards are charged with the duty of making their own rules severally and respectively.

I have the honor to be very truly,

A. J. BAKER.
Attorney-General.

WATER ANALYSIS.

During the fiscal period a large number of applications have been made for analysis of potable water. Under the rule, that the State Board will furnish an analysis only in cases where a water supply is suspected of a cause of sickness, and the request is made officially by a local board, but few requests have been granted. This fact, however, indicates that the people are giving more attention to the water they use.

In April, 1886, two samples were received from Mason City, which were taken from school-house wells. The following is the report of the chemist:

No. 1—Free ammonia	.866	parts per 1,000,000
Albuminoid ammonia	.18	" " "
Chlorine	3.12	grains per gallon
Solid residue	19.81	" " "

No. 2—Free ammonia	.0666	parts per 1,000,000
Albuminoid ammonia	.17	" " "
Chlorine	.6	grains per gallon.
Solid residue	18.12	" " "

Neither of the above are first-class. The free ammonia and chlorine of No. 1 indicates contamination with sewage.

In October four samples were received from Manchester.

No. 1—Well twenty-five feet deep, curbed with boards, sandy loam, ten inches; course sand, fifteen feet; fine sand, five feet, in which is the water supply. Cesspool forty-five feet southwest; one cemetery fourteen rods east; another cemetery ten rods west.

No. 2—Drive well, thirty-two feet deep; soil same as No. 1; privy eighty feet north; also seventy-five feet east.

No. 3—Dug well, twenty-two feet deep; wood curbing; soil same as Nos. 1 and 2; stable forty feet north; also forty feet west.

No. 4—Drive well, on school-house lot; twenty-five feet deep; soil sandy; two privies one hundred and eighty feet north:

The following is the report of the chemist:

Number.	GRAINS PER GALLON.		PART PER MILLION.	
	Solids.	Chlorine.	Free Ammonia.	Albuminoid Ammonia.
No 1	19.2	2.515	.2133	0.21
No. 2	48.7	2.84	.0533	0.09
No. 3	95 2	11.72	.0266	0.26
No. 4	25.4	2.54	.0533	0 22

Nos. 1, 3 and 4 are absolutely unfit for use, containing over 0.15 parts per million of albuminoid ammonia.

No. 2 is good water.

No. 3 comes properly under the head of mineral water.

The nearly uniform amounts of chlorine in Nos. 1, 2 and 4 probably shows the natural amount of chlorides in the water of that locality. The increased amount of chlorine in No. 3 indicates contamination with sewage, yet the increased solid residue gives it increased changes to exist as natural chlorides.

T. W. SHEARER, M. D.

In November, the people of Manchester, getting alarmed over their water supply, four more samples were sent for analysis.

Nos. 1, 2 and 3 were drive wells, twenty-four, thirty and thirty-four feet deep in sand. No. 4, drilled well; fifteen feet soil and sand; rock thirty-seven feet.

The following is the report of the chemist:

Number.	GRAINS PER GALLON.		PARTS PER MILLION.	
	Solid residue.	Chlorine.	Free ammonia.	Albuminoid ammonia.
No. 1	40.7	4.69	.0866	0.26
No. 2	20.	2.	.0206	0.11
No. 3	59.8	0 652	.0132	0.095
No .N4	61.1	1.95	.0146	0.11

Nos. 2 and 3 are good.

Nos. 1 and 4 are condemned. No. 1 unfit for use because of the large amount of organic matter, as shown by its high per cent of albuminoid ammonia. The large amount of chlorine in the sample is probably due to contamination of sewage.

No. 4 having almost double the limit of free ammonia, and reaching almost the limit of albuminoid, is not fit for use.

T. W. SHEARER, M. D.

In March was received four other samples from Manchester.

No. 1—School-house well, three hundred and two feet deep, thirty feet sand, one hundred and two feet gravel, one hundred and seventy feet rock, piped with iron, the tubing resting on rock.

No. 2—Dug well, thirty feet deep, sand and gravel, wood curbing, wood pump, privy ninety feet west.

No. 3—Is twenty-five feet deep, sand clay, thin rock strata near the bottom, iron tubing through the rock; privy eight feet south.

No. 4—Sand six feet, clay ten feet, rock three feet, clay one foot, gravel two feet, coarse sand three feet, quick-sand one foot resting on rock, wood curbing, iron pump resting on rock, privy fifty feet south.

Nos. 1, 2 and 3 are affected by the river when the water is high.

The following is the report of the chemist:

Number.	GRAINS PER GALLON.		PARTS PER LITER.	
	Solid residue.	Chlorine.	Free ammonia.	Albuminoid ammonia.
No. 1	18	0.75	Trace.	0.05 Millgramme.
No. 2	23	2.25	Trace.	0.04 "
No. 3	45	1.50	.00	0.03 "
No. 4	32	2.00	0.06	0.28 "

A. A. BENNETT.
Chemist.

Nos. 2 and 4 are condemed for potable use. No. 3 is suspicious.

In May two samples were sent by the local board of Charles City for analysis as to the fitness for supply for water works of the city. They were taken from a large spring at different times by different persons.

The following is the report of the chemist:

No. 1—Total solids	19	grains per imperial gallon.
Hardness (mostly temporary)	17	degrees.
Chlorine	0.8	grains per imperial gallon.
Free ammonia	0.026	" " " "
Albuminoid ammonia	0.163	" " " "
No. 2—Total solids	18.5	grains per imperial gallon
Chlorine	0.4	" " " "
Free ammonia	0.013	" " " "
Albuminoid ammonia	0.12	" " " "
Hardness (temporary)	15	degrees.

No. 2 is best; both very near to bad. Should be filtered for potable use.

A. A. BENNETT.
Chemist.

The above spring is large, located on the river bank, fifteen inches deep, water level same as that of the river. The water comes through lime stone.

PHYSIOLOGY IN THE PUBLIC SCHOOLS.

The law enacted by the Twenty-first General Assembly requiring physiology and hygiene to be taught in the public schools, with special reference to the effect of alcoholic drinks, stimulants and narcotics upon the human system, was a step in the right direction toward the preservation of public health. Experience, since the passage of the law, has shown an important omission therein. No provision is made to protect the public against the mercenary wiles of unscrupulous book-makers and the propagation of error.

Books on physiology and hygine generally, need no approval, nor censorship, but when the law requires that they shall treat upon the effect of alcohol and narcotics upon the human system, it becomes important that the subjects shall be given truthfully. It can be readily seen that unless the approval of some reliable board or censorship be secured, a class of books might be introduced in the public schools,

at least in some sections, most pernicious and erroneous in their teachings.

In view of the apparent importance of this matter the State Board at its May meeting in 1886, unanimously adopted the following resolution:

Resolved, That a committee of three be appointed by the President, to examine the various publications on physiology now in use in the public schools in Iowa under the provisions of Chapter 1, Acts of the Twenty-first General Assembly, and such other publications as they may deem proper with a view to recommend to the next General Assembly the adoption of a series on said subject best calculated to furnish correct knowledge upon the subjects required to be taught by said chapter, and to report at the next regular meeting of this Board, with such recommendations as they shall deem proper.

It is not the purpose of the State Board to select or recommend any particular publications, but to secure such supervision as will prevent the introduction into the schools of erroneous ideas.

THE CATTLE QUARANTINE.

There has been considerable chaffing in some of the States under the restrictions placed by the Governor and the State upon the importation of cattle into this State in June, 1885, and repeated effort have been made to secure a modification or repeal thereof.

The following correspondence is illustrative on this point:

STATE BOARD OF HEALTH,
BOWLING GREEN, KY., July 2, 1886.

Dr. Kennedy, Secretary State Board of Health, Des Moines, Iowa:

DEAR DOCTOR—Will you be kind enough to consult with the proper authorities in your State and let me know what further steps must be taken by this Board to secure a modification of or the raising of the quarantine your State has imposed against Kentucky cattle. Pleuro-pneumonia was stamped out in Harrison county, in March last, and that result officially declared by this Board and the United States Bureau of Animal Industry, and since that time there has not been the slightest occasion for fear of further outbreaks of this disease in the State, and yet I am informed that

this important industry is subjected to the same restriction in your borders as though we were still an infected country.

Trusting that our people may be relieved from these apparently unjust and unnecessary restrictions upon the part of your authorities, I am,

Very truly yours,

J. N. MCCORMACK,
Secretary.

IOWA STATE BOARD OF HEALTH,
OFFICE OF THE SECRETARY,
DES MOINES, July 20, 1886.

Hon. Wm. Larrabee, Governor of Iowa:

DEAR SIR—I have the honor herewith to transmit to you the enclosed official communication from the Kentucky State Board of Health for such action on your part as may seem proper.

Very respectfully,

J. F. KENNEDY,
Secretary.

STATE OF IOWA,
EXECUTIVE DEPARTMENT,
DES MOINES, July 8, 1886.

Dr. J. F. Kennedy, Secretary State Board of Health, Des Moines, Iowa:

DEAR SIR—Under instructions from the Governor I have the honor to acknowledge the receipt of your letter of the 6th instant, transmitting a communication from Dr. J. N. McCormack, of Bowling Green, Kentucky, relative to the restrictions placed by this State upon the importation of cattle from the State of Kentucky; and in reply to say that the Governor cannot safely take any steps in this matter without being in possession of authentic reports from the proper officers of that commonwealth concerning the health of her cattle.

I herewith return Dr. McCormack's letter.

Respectfully yours,

FRED'K W. HOSSFELD,
Private Secretary.

The State Board has received no sufficient reason for any change in the rule, but with a conscientious regard, not only for the cattle interests of the State, but for the protection of one of her most important food products, at its November meeting affirmed its previous action and indorsed the action of the Governor. The recent outbreak of pleuro-pneumonia among cattle in Illinois has evidenced the wisdom of this action.

To secure further protection against the infection of Iowa herds from Illinois cattle, the following proclamation and rules were made public:

QUARANTINE PROCLAMATION.

STATE OF IOWA,
EXECUTIVE DEPARTMENT.

WHEREAS, Many of the prominent farmers and stock-growers of the State, more and more realizing the extreme danger of pleuro-pneumonia, request that additional restrictions be placed upon the importation of cattle from the State of Illinois;

Therefore, I, WILLIAM LARRABEE, Governor of the State of Iowa, do now forbid the importation into this State from Illinois of any cattle, except in such special cases as may be approved by the Veterinary Surgeon of this State and upon compliance with such regulations as he may prescribe.

And again I appeal to all the citizens of the State, and especially to all State, county and municipal officers, so aid to the best of their abilities to ward off from our State the calamity of an invasion of that dreadful plague.

In testimony whereof, I have hereunto set my hand and caused to be affixed the great seal of the State of Iowa.

Done at Des Moines, this 15th day of February, A. D. 1887.

WILLIAM LARRABEE.

By the Governor:

FRANK D. JACKSON,
Secretary of State.

OFFICE OF STATE VETERINARY SURGEON,
DES MOINES, IOWA, May 10, 1887.

To whom it may concern:

The following amended rules governing the introduction of cattle into this State from the State of Illinois are hereby promulgated:

1. The importation of cattle kept within the last twelve months in Cook county, Illinois, or any of the counties adjoining it, is absolutely prohibited.

2. The importation of other cattle coming from the State of Illinois, is prohibited, unless their owner, shipper or attendant furnish the following evidence that they are free from contagious disease:

Certificate from the Veterinary Surgeon of the State of Illinois that he finds the cattle to be shipped free from pleuro-pneumonia and other contagious diseases; that he has made a careful investigation, and is satisfied that said cattle have not, within the last twelve months preceding the date of shipment, been kept in Cook county, Illinois, in any of the counties adjoining Cook county, or any other locality in which pleuro-pneumonia exists; and that they have not in any way been subjected to the influence of any contagious disease.

Affidavit of two disinterested and reputable citizens and freeholders of the county from which the cattle were shipped, to the effect that they have personal knowledge that said cattle were owned by the shipper, and kept on his premises for at least twelve months immediately preceding the time of shipment, and that they were not exposed to pleuro-pneumonia during that period.

Affidavit of owner that the cattle are the identical animals examined by the State Veterinary Surgeon and described in his certificate; that the cattle have not been exposed to any contagious disease while in transit, and that the cars in which they are transported were thoroughly cleansed and disinfected before shipment.

3. All cattle coming into this State in violation of the proclamation of the Governor or the foregoing rules may be held in quarantine for ninety days at the expense of the owner.

M. STALKER,
State Veterinary Surgeon.

Approved May 10, 1887.

P. W. LEWELLEN, M. D.,
President Iowa State Board of Health.
J. F. KENNEDY, M. D.,
Secretary Iowa State Board of Health.

Approved May 25, 1887.

WM. LARRABEE,
FRANK D. JACKSON,
J. A. LYONS,
V. P. TWOMBLY,
Executive Council.

SANITATION IN RAILROAD CARS.

At the May meeting, 1887, of the Board, the sanitation of railroad coaches was considered, and the secretary was instructed to present the subject to the Railroad Commissioners, which was done in the following communication:

IOWA STATE BOARD OF HEALTH,
OFFICE OF THE SECRETARY,
DES MOINES, May 16, 1887.

Honorable Board of Railroad Commissioners for Iowa:

GENTLEMEN—At a meeting of the State Board of Health, held May 10th,

in view of the threatening advance of cholera, and its possible invasion of Iowa, the following resolution was unanimously adopted:

"We, the committee to whom was referred the matter of disinfecting passenger coaches and boats, submit the following, to-wit: That in order to prevent the spread of disease, and to preserve the public health, we hereby recommend that all passenger and sleeping coaches, operated within or through the State of Iowa, and all boats landing at points within this State be thoroughly and frequently disinfected."

It is the desire of the Board that so far as possible, your honorable body require this precautionary measure to be duly executed.

The Board further instruct me to call your attention to the fact that in many of the passenger coaches the "water-cooler" containing the drinking water for the passengers, is in close proximity to the door of the "water-closet," thereby not only polluting the water, but subjecting those drinking the water—often women and children—to the most unsavory odors.

The ax and saw carried in all passenger coaches, presumably for the purpose of aiding in the release of passengers and trainmen in case of accident, on several of the Iowa railroads are placed on the inside of the car on the end next the stove. In case of collision, a more inaccessible place could hardly be found, or imagined. A much better place would be on the outside of the coach about the middle, and on each side thereof.

I was instructed to suggest also, that if the surgical corps of the railroads would provide same simple surgical appliances, such as bandages and tour niquet, and instruct the trainmen in the use of the same, that valuable lives might be saved thereby.

The State Board of Health. therefore, respectfully request your honorable body to take such action in the premises as may be deemed expedient and necessary to secure the ends sought.

I am very respectfully,

J. F. KENNEDY, M. D.,
Secretary.

STATE OF IOWA,
OFFICE OF THE RAILROAD COMMISSIONERS,
DES MOINES, May 18, 1887.

Hon. J. F. Kennedy, Secretary of the Iowa State Board of Health:

SIR—Your communication of the 16th instant, enclosing the report and resolutions with reference to the matter of disinfecting passenger coaches, etc., was received this day and shall have proper attention.

Very respectfully,

E. G. MORGAN,
Secretary.

A copy of the request made to the Railroad Commissioners, with the following communication, was addressed to the various railroad companies:

OFFICE OF THE BOARD OF RAILROAD COMMISSIONERS,
DES MOINES, IOWA, May 20, 1887.

DEAR SIR—The enclosed communication from the Iowa State Board of Health has been received at this office:

The powers and duties of the State Board of Health are defined in Chapter 151, of the Laws of the Eighteenth General Assembly.

Please examine the communication and report to this Board if the enforcement of the suggestions therein contained are practicable, and if not, suggest any changes that you may deem desirable to accomplish the purposes sought. By order of the Board,

E. G. MORGAN,
Secretary.

Reply was soon after received that a thorough system of disinfection of cars on which passengers are carried had been put in force on all roads, consisting of a thorough cleansing at the terminal points. Just before departure, the cars are sprinkled or sprayed with a solution of menthol, and to the water-closet pans and urinals a corrosive sublimate solution is applied, the latter being repeated every hour. during the trip. The companies should be highly commended for the zeal and earnestness with which they have enforced these sanitary suggestions. The promptness of their action gives promise of approval and enforcement of the further suggestions made regarding the ax, saw and water-cooler.

RELATION OF IDLENESS TO HEALTH.

Believing that the enforced idleness through labor strikes and other causes, of thousands of persons accustomed to vigorous exercise and healthful habits is a fruitful cause of sickness, the following communication was addressed to the Commissioner of Labor Statistics:

IOWA STATE BOARD OF HEALTH,
OFFICE OF THE SECRETARY, June 1, 1887.

Hon. E. R. Hutchins, Commissioner of Labor Statistics:

DEAR SIR—I would like in my biennial report to the Governor to show what relation idleness, whether from choice or the inability to procure employment, bears to the sanitary condition of the State.

The records of your office, and your personal observation in the field of

labor statistics, doubtless furnish you with many facts demonstrating that idleness, especially among the laboring classes and wage-workers of the State, is a potent factor in the causation of sickness and death. I think you will be able to show that protracted strikes, and the enforced idleness caused thereby produce many diseases dependent upon general debility and depressed mental conditions, and render all such much more liable to attacks of infectious and epidemic diseases, and much less likely to recover therefrom.

If you can furnish this office with a statement, giving data and deductions therefrom, touching the above points, at your earliest convenience, it will not only be duly acknowledged but greatly appreciated.

Very respectfully,

J. F. KENNEDY,
Secretary.

STATE OF IOWA,
BUREAU OF LABOR STATISTICS,
DES MOINES, July 6, 1887.

Dr. Kennedy, Secretary Board of Health:

MY DEAR SIR—Your letter of recent date, asking data and deductions thereupon tending to show the relation that idleness bears to the sanitary condition of the State, was received, and I regret to say that I am unable to give it that attention which would make the same valuable. Voluntary idleness unquestionably produces an unhealthy physical condition. The same would be true from idleness produced by strikes. Fortuately for Iowa the latter has been of very meagre porportions. As a rule the wage workers of Iowa are an orderly, sober and industrious class, and as a result strikes are few and of short duration. These characteristics in our wage workers also make voluntary idleness rare. The idleness we have, is largely due to "no work." Statistics show this to be true in nearly all phases of industrial life, but the work of this office is so comprehensive, and covers such a vast field, that your query I cannot knowingly answer. Two very important subjects were given me for investigation by the Senate of the Twenty-first General Assembly, and these, with the work I laid out at the commencement of the present term, have employed all my time.

As this department of work grows, special subjects of investigation can be taken up, and that suggested by you should be among the early ones.

Very respectfully yours,

E. R. HUTCHINS,
Commissioner.

DECISIONS OF THE STATE BOARD.

SMALL-POX.—For protection of a physician attending a case of small-pox, a common rubber, or thin gossamer (rubber) long coat, buttoning to the chin, and an old hat, to be laid aside on leaving the patient, and thoroughly clensing the hands is sufficient. At the termination of the disease the coat and hat must be burned.

BURIAL PERMITS.—The rules regarding Burial Permits apply only to deaths occurring within the corporate limits of a city or town. In all such cases a permit must be obtained The burial begins when the body is prepared for burial, and it makes no difference whether final interment is had within or outside of the city. Depositing a body in a vault is deemed a burial.

CLOSURE OF PULLIC SCHOOLS.—On an outbreak of contagious disease it is unwise to close the public schools. Children sick from scarlet fever or diphtheria, and other children in the same family, must be quarantined, but adult members of the family need not be rigidly quarantined, provided they observe the proper methods of disinfection and change of clothing. In small-pox the quarantine and isolation must be general.

WATER ANALYSIS.—When public utility and safety to the public health are involved, the State Board will procure an analysis of water from water-works where the supply is taken from wells, lakes, or streams, and will pay one half the expense. In cases where a water supply, private or public, is suspected of causing sickness, or where the same has been condemned for use by a local board, the State Board will, on official request made by such local board, procure an analysis of such water at its own expense.

PUBLIC FUNERALS.—The rule prohibiting public funerals of persons dead with scarlet fever, diphtheria, small-pox, means the exclusion of all persons, except the family, the attending physician, and undertaker. No other person must be permitted to enter the premiser where the death occurred. Where the dead body has been prepared for burial in accordance with the rules, there is no objection to

a gathering at the grave, and short service, providing the family of the deceased are under the rules, authorized to be present, by previous disinfection of clothing, but the coffin must not be opened.

HEALTH OFFICERS.—The duties of a health officer of a local board do not require him to question the diagnosis of the attending physician in cases of suspected contagious disease, unless recurring and well authenticated cases lead to the positive conclusion that the attending physician is in error. In such case the visit of the health officer to the sick should be upon invitation of the attending physician, or upon direct order of the local board. The visit will be confined solely to the diagnosis. All sick persons, have the right to employ whom they please to treat them. The province of the health officer and the local board is to prevent the spread of the disease.

QUARANTINE.—The State Board has no power to set aside rules or regulations of local boards. Rules quarantining adult members of families, and closing public schools in cases of scarlet fever, especially when disinfection and isolation of the diseased are practiced, is unwise and unnecessary.

In contagious diseases, patients should be instantly removed and isolated in an upper, well ventilated, and sunny room, stripped of all unnecessary furniture, such as curtains, carpets, woolen articles, sofas or lounges, covered chairs, bookcases, pictures, trunks or boxes, toys, musical instruments, etc. A bed, table and chair are sufficient. The contagious principle should be diluted and destroyed in every possible way by thorough ventilation, destruction, or satisfactory disinfection, of every article with which those affected may have come in contact. Patients should, if possible, be kept in separate rooms, to lessen the intensity of the poison and consequent danger of contagion. Attendants should have a calico wrapper to wear over the other clothes when in the sick room, and should (if possible) not mingle with people liable to take the fever without changing all clothing, and thorough ablution of hands and head. Cleanliness of patient and surroundings is of the first importance. There are no substitutes for cleanliness and fresh air. Open windows, doors and fireplaces, if possible, and an adjoining room with windows wide open, are all invaluable.

Where manure from a stable occupied by a tenant is deposited on adjoining land owned by another, and becomes a nuisance, to whom should notice be given for its removal ?

Ans.—The person who committed the nuisance is primarily liable. The owner of the lot is liable also, for maintaining a nuisance after notice. The local board may remove it, if the other parties refuse or neglect to do so, and the cost would lie against the premises whereon the nuisance exists.

Has a local board the legal right to send a physician to examine a person reported to be sick with diphtheria, and attended by another physician, and against the wish of the attending physician ?

Ans.—Yes. A local board has power to adopt any measures deemed necessary to protect its community against contagious disease.

Is the health officer of a local board required to accept the statement of an attending physician regarding a disease prevalent within his jurisdiction; or is such health officer required, by virtue of his office, to verify the diagnosis of the attending physician ?

Ans.—The health officer of a local board is not required to question the diagnosis of an attending physician, unless recurring cases, or well authenticated symptoms, lead to a certainty that the attending physician is in error, in which case the visit by the health officer to the case should be upon invitation of the attending physician, or upon the order of the local board.

Would it be reprehensible for a quarantined party to remove to another township twenty-seven days after beginning of diphtheria in the family, if disinfection is had on persons and locality ?

Ans.—No, not if the removal was by private conveyance. Yes, if removal was by public conveyance. The quarantine in scarlet fever and diphtheria is not so much to prevent others than the sick from going off the premises as to prevent others, especially children from going on the premises, or entering the sick room.

At what stage of pregnancy is it permissible to kill animals for food ?

Ans.—At no time after three months in cattle, and thirty days in swine and sheep. No pregnant animal *fere natura* is fit for food.

Where a person died from typhoid fever, and twenty-four hours after, permission was given to place the body deposited in a coffin in a primary public school room, the local board interposed objection and ordered immediate burial, did the board do right ?

Ans.—Yes.

Where a person died outside of a corporation, and is buried in a cemetery within the corporation, is a burial permit required?

Ans.—The rules of the State Board apply only to deaths occurring within the limits of a corporation, no matter where the body may be buried. A municipal corporation may, by ordinance, require a burial permit in all cases of burial within its limits, regardless of where the death occurred.

Is section 420, of the Code, repealed by chapter 151, Laws of Eighteenth General Assembly?

Ans.—The Attorney-general says it is not.

Is the health officer of a local board bound to visit and examine a sick person by order of the board, without the knowledge or assent of the attending physician?

Ans.—No. Scarce any emergency could arise where the health officer could not, and should not notify the attending physician, and thus by courteous measures, recognize the rights and professional honor due the attending physician.

Is a local board of health legally bound to enforce rules and regulations made by the State Board of Health?

Ans.—The Attorney-general says yes.

Has a local board the power to order their health officer to visit and examine a person, without the knowledge or assent of the attending physician?

Ans.—Yes, when the board has good reason to believe the person is sick from a contagious disease, and who, from a mistaken diagnosis of the attending physician, or other cause, has not been, in the opinion of the board, properly quarantined and isolated. Such arbitrary power should seldom be exercised, as the protection of the people from the spread of contagious disease can hardly ever be so well attained, as with the co-operation of the attending physician. Every sick person has the right to employ whom he or she pleases to attend them. Antagonism and obstruction often go hand-in-hand.

Can a local board enforce rules making vaccination of school children compulsory, and exclude non-vaccinated children from public schools?

Ans.—The Attorney-general says: "I have no question at all but that local boards of health have the power to regulate and determine how vaccination shall be done, and that *all persons* shall be vaccinated."

Can I conduct a funeral service of a person who has died of diphtheria? As I read the law (p. 16 pamphlet on restriction and prevention of diphtheria) I can hold a private service; that is, a service where only a few are present, and where a short prayer is offered and perhaps a hymn is sung. Am I correct in my interpretation of the law?

Our city physician declares that a minister is forbidden to go inside of a house where a person has died of diphtheria, or to hold even the shortest kind of a service. He declares that the body must be buried without any service of any kind whatever. It seems to me that it is an incorrect interpretation of the law. Which is right?

Last Monday afternoon I was called upon to attend the funeral of a child who died early that morning of diphtheria. I went, and ten persons were present, six belonging to the family, and four friends, including myself. Is that an indiscriminate attendance? Is a funeral of that size a public funeral? I am told by our health physician that it is. Consequently I had a notice served upon me on Saturday, two days after the funeral, and was placed under quarantine and shut up for two days, being also obliged to fumigate my clothing. Was the board of health justified in their action? Had I violated the law, and did I deserve the punishment?

I have no desire to disobey the law, but on the contrary, am anxious to obey it to the letter. But what I want to know is this: Is a funeral service of any and every kind forbidden where a person has died of diphtheria? Did I violate the law of the State Board of Health in attending of a child who died of that disease when only three persons beside myself were present?

Ans.—The rules prohibiting public funerals of "persons dying from small-pox, scarlet fever and diphtheria," as well as from other contagious and infectious diseases, and defining a "public funeral" to mean the "indiscriminate attendance of persons not immediately connected with the family of the deceased person," etc., was adopted by the State Board of Health with the firm conviction that such prohibition was clearly in the interest of public health. There would be no question about their propriety in a case of small-pox; but little question in a case of scarlet fever; why any more in a case of diphtheria.

The records in this office show that more persons die in this State annually from diphtheria than from small-pox and scarlet fever combined, and all eminent authors believe and teach that the disease is highly infectious if not contagious. In the case to which you refer, if you had children at home, you wantonly and recklessly exposed

them to the infection. In your pastoral duties you were in danger of carrying the disease to other homes, if not perpetuating, at least spreading the disease. You ask if four persons outside the family—ten persons—constitute a public funeral? One person more than was necessary to prepare the body for burial and inter it made a public funeral, and was in violation of the spirit and letter of the law. It was necessary for the physician to be there during the sickness and perhaps during the preparation of the body and for the undertaker.

It is not the province of the State Board to resist nor obstruct any rules enacted by local boards in the interest of public health, and especially when in accordance with law. This Board sustains the action of your local board in this matter, and heartily commends the action of your health physician.

CONTAGIOUS DISEASES.

The statute requires all clerks and health officers of local boards to make an annual report to the State Board of Health. For that purpose blank forms are supplied by the State Board. Of the two thousand and sixty-five local boards in the State, less than three hundred have made a report. A compilation of the number of the cases of contagious diseases during each year of the biennial period in the several cities, towns and townships of the State is omitted from this report; for if made, it would be practically worthless, as any indication of the facts existing in the State entire. Vital statistics are of no value unless complete, and the labor and cost of compilation and publication thereof are simply wasted.

SANITARY SURVEY OF SCHOOL-HOUSES.

The following letter was received at this office from the Superintendent of Public Instruction:

THE STATE OF IOWA,
DEPARTMENT OF PUBLIC INSTRUCTION,
SUPERINTENDENT'S OFFICE, Des Moines, May 1, 1885.

Secretary State Board of Health:

MY DEAR SIR—I desire through you to call the attention of our State Board of Health to the unsanitary condition of many of our school buildings and their surroundings.

I feel assured that an astonishing revelation would be the result of a general exhibit of the facts that might be easily collected with relation to heating, lighting and ventilating the houses in which more than five hundred thousand children are spending fully one third of their time.

The condition and situation of wells, springs, out-houses, school-yards, and their immediate environments, as affecting the health of these children, and of entire communities, should be so thoroughly investigated, and by those having authority and whose duty it is to act, as would result in awakening our people to the importance and necessity of protecting our children, our homes, and our communities from the ravages of diseases which no doubt in many instances owe their origin to the defective sanitary conditions in our school-buildings, and all that pertains to school life.

Respectfully,

JOHN W. AKERS,
Superintendent of Public Instruction.

DES MOINES, May 1, 1885.

Believing that a systematic report to this office of the sanitary condition of the school-houses of the State would lead to the correction of many errors that exist, the State Board of Health, encouraged by this letter from the State Superintendent of Public Instruction, at once issued a circular seeking information relative to the size, location and surroundings of the school buildings; the location of the doors and windows and the number of the same; the location of the blackboard—whether opposite or between the windows; the condition of the cellars and drainage of the grounds; the means of ventilation and heating; the location and character of the privies; the source of water supply, and, where wells are used, their contiguity to sources of pollution; the average attendance and seating capacity; the

number of pupils that are near-sighted; the length of time required to empty the school-house in case of emergency, and the facilities for egress; and asked for such suggestions as they might desire to make that would improve the sanitary condition of their respective buildings. This circular was issued shortly before the completion of our last biennial report, and the questions asked and information desired will be found in that report.

This circular, with the following letter, and also the one above from Superintendent Akers, was sent to every school in the State—to superintendents, principals and individual teachers of county schools:

THE STATE OF IOWA,
HEALTH DEPARTMENT.
OFFICE OF STATE BOARD OF HEALTH, Des Moines, May 25, 1885.

To the Teacher:

The letter * * * from Hon. J. W. Akers, Superintendent of Public Instruction, suggests the importance of the inclosed interrogations, which have been prepared with care. Correct answers to these questions require but little time and labor, and as all methods of improvement are based upon accurate knowledge, may we not confidently expect you to cheerfully do a part of this important work?

Please answer each question, however seemingly unimportant, and return immediately.

J. F. KENNEDY, M. D.,
Secretary of State Board of Health.

The biennial report of the State Superintendent of Public Instruction for 1887 shows that there are 14,829 schools in the State, accommodated in 12,444 school-houses, 11,387 being constructed of wood, 787 brick, 227 stone, and 43 log. These schools contain over a quarter of a million scholars—in exact figures, 284,567. Of this number, we received only 172 reports, representing 482 schools, and an attendance of 22,892 pupils. We regret exceedingly that so few of the teachers of the State have seen fit to reply to our questions.

From these few reports, some facts are learned of sufficient interest to lay before the people of the State.

It may be said in a general way, that our school-houses have been carefully located. They are generally on the hill, or ground well drained, well removed from ponds or standing water.

We were impressed with the figures showing the cubic feet of air allowed for each pupil. Experience has shown that at least 250 cubic

feet should be allowed for each scholar in each room. The reports show only forty-six school rooms below 250 feet standard. The building showing the lowest air space was reported at 108 cubic feet. The next lowest at 111; two at 113. On the other hand, one school room is reported as having 1100 cubic feet per scholar; one 969; one 933; one 730; one 650, and several over 500, with, as stated before, only forty-six schools below the healthy standard.

Much of the benefits derived by this ample air space is counteracted by inadequate means of ventilation. A large number of the buildings are constructed without transoms over doors, without registers or ventilating flues or shafts, and depend wholly upon such ventilation as may be obtained by opening the doors and windows.

No argument is needed to prove the benefits of pure air, or the injurious effects of foul air. One of the poisonous elements of an improperly ventilated room is the accumulation of carbonic acid gas thrown off from the lungs. But this is not by any means the only danger. Organic substances of various kinds need to be removed, and fresh air supplied. There should be about an equal quantity of fresh air entering and escaping from the building all the time of its occupancy—the object being to have the air within the building as nearly like that without, as possible.

The reports further show that in many instances the water supply is from very doubtful sources—indeed in many instances from positively dangerous sources.

Several school houses in the rural districts are contrary to the law, surrounded by barbed-wire fences.

A large proportion of the teachers report the use of privy vaults—holes in the ground; and that in some instances they are not cleaned out until filled up; seldom disinfected, and in many cases, possess no means of ventilation whatever. Such a condition should not exist. The children taught justly, and by special law, the pernicious effects of tobacco and alcohol, should also have some practical lessons in disinfection and other sanitary measures. The moral, to say nothing of the sanitary advantages arising from the children returning to school after a vacation, on finding the privy vault cleaned out, disinfected, and whitewashed, cannot be estimated.

There has been criminal neglect in the lighting of the school rooms in a large number of instances. The windows in many are immediately in front of the scholars, and in too many, the black-boards are

between the windows. As a result, it is shown that there are 928 near-sighted pupils in an aggregate attendance of of 22,892. The proportion is really much larger since thirteen teachers made no report as to the number so affected. A number reported "don't know"; some reported "no test made."

To illustrate the results as to near-sightedness, we may state that in one town, in a report for four buildings, the pupils in attendance were 1,130. By actual test there were 148 affected with impaired vision. In another place where there were 730 reported in attendance there were 169 with defective vision. In another, 380 pupils, and 60 with defective vision.

A principal furnishing a very full and complete report of the schools of an independent district in Clayton county, says:

"We have tested the sight of every pupil in school with Snellen's types, and find there are only 31 who can read the first, and but 20 who can read the second. We have four who cannot read the 9, 14 and 32 ft. type. I think that the failure to read the small type is due to the blurred print. I cannot believe that with clean cut print we should have the failure mentioned above. We have employed great care in the tests."

We can hardly believe that the defective vision above reported is due in anything like the proportion reported to defective type. The large per cent deficient had no more obstacles to encounter except the physical defect of the eyes than the thiry-one who read the first, and the twenty who read the second type. In this school building there were 180 reported in attendance.

While some of the black-boards were opposite the windows, others are reported as "between the windows. Must have them there, with so many windows."

Nearly all the buildings erected recently are provided with doors opening outward, and many of the older ones are so remodeled as to have ample means of egress. Large buildings containing four and five hundred pupils—some three stories in height—can be, and have been, vacated by actual test in two and a half and three minutes, without injury to the children.

In nearly all cases, the teachers report that the rules of the board of health respecting contagious diseases are adopted, and enforced by the school boards.

The question, "what suggestions can you make to improve the hygienic condition of the school?" has called out a great variety, and

very interesting replies. Forty-three wanted better means for ventilating the rooms; 31, better heating facilities; 14, better light; 11, better seating facilities; 11, not anything needed; 12, privies farther removed and better ventilated and disinfected; 6, greater cleanliness of school-rooms; 6, better drainage for cellar; 7, better black-boards; 4, better water supply; 7, new school-houses, better grounds and gymnasium; 2, better clothing for children; 2, better building sites; one would make school hygiene a subject of physiology as well as stimulants and narcotics; one would do away with "up stairs," and have all the rooms on the ground; one (a gentleman) deplores tight lacing, and favors a law prohibiting corsets; two recommend greater cleanliness on the part of parents; one would prohibit parents from using tobacco; many do not answer the question at all.

In 1880, New York offered prizes for the best school-house plans. In awarding the prizes the committee declared the following as some of the requisites of a proper building:

"At least two adjoining sides of the building should be freely exposed to light and air, for which purpose they should not be less than sixty feet distant from any opposite building."

"In each class-room the window space should not be less than one-fourth of the floor space, and the distance of the desk most remote from the window should not be more than one and one half times the height of the top of the window from the floor."

"The height of the class-room should never exceed fourteen feet."

"The fresh air should be introduced near the windows; the foul air should be removed by flues in the opposite wall."

There is no question that the large number of cases of myopia—near-sightedness—reported is largely due to deficiency of light, and a faulty arrangement and location of the windows and black-boards. Black-boards, or green-boards which are better, should never be placed between the windows; nor should the surface be polished.

We believe that the State, through the State Superintendent of Public Instruction, the State Board of Health, or a State Architect, should have a general supervision of the construction of the school buildings of the State; that models, or plans adapted to city or country, and combining the latest and best sanitary conditions, should be procured and adopted. Many believe that a house with proper sanitary and hygienic surroundings is an expensive luxury, that none but the wealthiest independent districts can indulge in. Such a belief is very far from the truth. School buildings having

special reference to ventilation, heating, seating, lighting, and the proper disposition and disinfection of the excreta of the pupils, can now be constructed at a cost within the reach of any country district. The State owes it to her children, who spend such a large proportion of their days of physical, as well as mental development, in the school house, in which she has such a just pride, that these buildings shall be such as shall in no way contribute to physical or mental deterioration.

COUNTY AND CITY PRISONS.

To secure reliable and complete information regarding the sanitary condition of the county jails and city prisons throughout the State, a circular was addressed to the health officer at each county-seat, and of each city, requesting them to make a personal inspection of the jail and prison in their locality, and report:

1. Its location, whether isolated or connected with the court-house.
2. Whether built of wood, stone or brick.
3. Whether entirely above or partly beneath the surface of the ground.
4. Number of cells, dimensions of same and how lighted.
5. Ventilation, and means of disposing of sewage.
6. General sanitary condition; with such suggestions for improvement as may suggest themselves.

The result of the inquiry is not entirely satisfactory, yet it is sufficient to show the condition of the prisons of the State. The following replies have been received:

Adams County.

1. County jail. Isolated; located on a hill, in highest part of the village.
2. Stone, two stories high; lower story and basement occupied by the jailor.
3. Jail in second story.
4. Two cells, 10x12, 8½ feet high; window, 2½x5 feet, in each cell; lighted at night by kerosene lamps.
5. Ventilation good, and secured by raising and lowering window-sash. Sewage is conveyed to river by pipes.
6. General sanitary condition excellent.

Allamakee County.

1. Isolated; located on a little hill.
2. Brick.
3. Above ground.
4. Eight cells—two for insane.
5. Ruttan furnaces. Sewage conveyed to vault seven rods distant.
6. Sanitary condition good.

Benton County.

1. No city prison. County jail is attached to sheriff's residence, and isolated from court-house, one hundred feet.
2. Brick.
3. Entirely above ground.
4. Two cells on first floor, surrounded by an iron cage. Two rooms in second story, for confining females.
5. Ventilation by windows, and good. Sewage of lower cells conveyed in large pipes to the river. Slops and offal from upper cells conveyed in pails to outside privy vaults once each day.
6. Sanitary condition excellent, except that for the second floor.

Appanoose County.

1. County jail isolated; not connected with court-house.
2. Stone, one story high, lined with iron; adjoins jailor's residence.
3. Entirely above ground.
4. Four cells; corridor in front of each. Two cells 9x12, by 9 feet high; two corridor cells 5x8–4, by 10 feet high. Two windows on north and south sides, 20x24 inches. Grated doors in front of cells, 2 feet wide, 5½ feet high; scuttle holes between cells. Sheet iron roof. Lighted by kerosene oil at night.
5. Ventilated by doors and windows; not good. Sewage carried away in buckets.
6. Sanitary condition not good; ground low. Street higher than the lot, causing surface overflow.

Centerville.

1. City jail; in city hall building; 3 cells. Two are 11x6 feet, by 8 feet high; one is 11x11 feet, by 8 feet high. Ventilation through openings in the ceiling, 8x12 inches. Grating doors, 2 feet wide, 5 feet 8 inches high. Corridor in front of cells, 7 feet wide, 12 feet high. Ventilation poor. Cells are really an old fashioned sweat-box.

Black Hawk County.

1. County jail isolated.
2. Wood, with partly steel cells.
3. Entirely above ground.
4. Three steel cells, 8x8x7; two cells, wood and iron, 8x10, for women and insane.

5. Ventilation by grated windows; sewerage by pipes to Cedar river.

6. General sanitary condition fair. Connection with water-works will soon be made.

Waterloo.

1. City jail; stone, 20x30 feet, divided by iron grating into two compartments, and used only for "drunks" and tramps. Cement floor; privy with vault.

Boone County.

1. County jail; two blocks from court-house.

2. Brick and iron, two stories high. The upper story occupied by cells; the lower story occupied by the jailor.

3. Entirely above ground.

4. Two iron cells, 7x7x8; corridor in front of cells, 14x16 feet.

5. Ventilated and lighted by iron barred windows. Sewage is deposited in vault beneath a closet connected with the corridor. Leading from the vault is a 12 inch tile drain to a cess-pool, 7x9 and 10 feet deep, curbed with boards 6 feet from the bottom. No traps nor ventilation to the drains except into a brick flue beside the vault and extending to the roof. Contiguous to the cell-room is a room, 8x8, used for female prisoners, all sewage from which is deposited in movable vessels and removed by officers in charge.

6. Sanitary condition bad. The drain is unprovided with traps and has no ventilation except a brick flue built beside the vault, and extending above the roof of the building. There is no check to the flow of sewer air back into the closet and thus into the cage where the inmates must necessarily continue to inhale more or less of the same from day to day, during their incarceration, which sometimes is for months. Abandonment is about the only remedy. The family occupying the lower portion of the building have had sickness nearly all the time. The present keeper is in poor health. One keeper was compelled to abandon the place because of complete failure of health of himself and wife.

Assuming that our county jails as a rule, contain untried men and women, and adopting the legal axiom that a person is innocent until proven guilty, the query comes very forcibly to my mind, as to whether the State has the right to thrust innocent men and women into a place loaded with noxious gases, and compel them, because of their inability to secure freedom on bail, to inhale for weeks and months that which is manifestly poisonous and injurious—awaiting the slow and tedious process of law? None would deny the right of the State to restrain—to punish even to the extent of taking the life—but, conceding these rights, does not carry with it the right to trifle with one's health. That is above all, and dearer than all else in life.

Now, if these propositions be true, why should not the Assembly pass a law compelling counties to build or remodel their jails after some standard and approved method, whereby the health of prisoners may be assured?

I do not know the law, but would *like* to know, if a prisoner while in jail, loses his health, and it can be shown that his health was impaired by unhealthy prison surroundings, has he not just grounds for an action to recover damages? Has the State the right to hold an innocent man—not a convict, held only on suspicion, or as a witness, and compel such an one to "horde" with the low and vile, and notoriously bad? Under the present methods of construction, as entrusted to the county supervisors, few of whom as a rule know anything of sanitary science—all of these hardships in many cases must be endured.

Boone.

The city prison is attached to and a part of the city hall. The building is of brick two stories high, with basement. The prison is on the first floor, with basement beneath, and is composed of a cage divided into two cells 6x7½ feet and 8 feet high; grated door, and grated ventilation in the ceiling of each about 12x18 inches. The room in which the cells are situated is about 17x21 feet and 20 feet ceiling. Above the cage are three transom windows about 15x 30 inches. There are three doors entering said room, one heavy outer door, the upper half provided with iron grating and closed in winter time by a swinging sash. The heating is by a large soft coal burner, situated near to and in front of cell doors.

Sewage is deposited in movable buckets and cared for by the officer in charge. The entire cage inside and outside, and including the outer or receiving room, are thoroughly whitewashed, and, taken as a whole, are in a very creditable sanitary condition, used, as they are, for only a few days at a time for any one person.

Benton County.

1. The jail is within the court-house, on high ground.

2. First story and basement, stone; second and third stories, brick.

3. Basement partially below the ground, on side hill.

4. Seven cells below ground; four are 7x9 feet by 8 feet high, three are 9x11 feet with window in each. In the first story above ground is an iron cage, 12x12 feet, 7 feet high, divided into two compartments. The four cells are lighted by one window.

5. No ventilation except by window. The sewage from the lower cells is nil. That from the upper cells is conveyed by pipes to a cess-pool fifteen feet distant from the building.

6. The sanitary condition is not good.

Buchanan County.

1. Jail isolated, on high ground.

2. Constructed of stone.

3. Entirely above ground.

4. Six cells, 8x4½; lighted by two large windows and grated doors.

5. Ventilation through the grated doors and air duct in each cell near the floor. Sewage deposited in a cess-pool in the jail yard.

6. Sanitary condition good.

Buena Vista County.

1. Jail isolated; new.
2. Built of brick.
3. Entirely above ground.
4. Four steel cells, 6x7 feet, 7 feet high, and two corridors, or main cells. Well lighted.
5. Well ventilated; sewage conducted to cess-pool some distance from the jail.
6. Sanitary condition excellent.

Clarke County.

1. County jail isolated.
2. Built of brick.
3. Is entirely above ground.
4. Divided into two large rooms, one of which is sub-divided into an "insane room" and a "calaboose" for the use of the city. The other room is provided with a steel cage which is divided into two cells, 7x9 feet, and is the jail proper. Lighted by windows.
5. Ventilation by window; sewage carried off by sewer.
6. Sanitary conditions excellent.

Clayton County.

1. Jail one-fourth mile distant from court-house.
2. Built of stone.
3. Partially beneath the ground.
4. Twelve cells in two tiers, six above, six below, 8x8 feet, 8 feet high, lighted by four windows, the light passing through the jail hall, which is 15x40 feet; badly lighted; no sun-light can enter the cells until about 4 P. M.
5. Ventilation by 6-inch flue in the ceiling of each cell, and three 8-inch flues in the ceiling of the hall. Water-closets separated from cells, the doors opening into the hall. Sewage conducted to cess-pool, 16x16, and 16 feet deep. There is no water supply to flush the conduit pipe, and the odor during hot weather is hardly endurable.
6. The sanitary condition is fair considering the construction of the jail. Water supply should be provided, and means by which inmates can get sun-light and fresh air a portion of the day.

Cerro Gordo County.

1. Jail isolated.
2. Built of brick, and lined with iron plates.
3. Is entirely above ground.
4. Three iron cages, 7x7 feet.
5. Ventilation and sewerage excellent. The latter is conveyed to a cess-pool 16x16, and 30 feet deep.

6. General sanitary condition good. No provision is made for the separation of the sexes.

Crawford County.

1. Jail isolated.
2. County jail, brick; city prison, wood.
3. Built entirely above ground.
4. County jail, 4 cells, 10x14; lighted by lamps.
5. Ventilation good. Each cell provided with good sewerage.
6. Sanitary condition excellent.

Franklin County.

1. Jail isolated one block from the court-house.
2. Built of brick.
3. Entirely above ground.
4. Five iron cells, and corridor. Lighted by lamps.
5. Ventilated by air ducts passing through the roof. Sewage washed into a sewer by water from a tank.
6. Sanitary condition good.

Greene County.

1. Jail isolated, two blocks from the court-house.
2. Brick, with stone foundation.
3. Entirely above ground.
4. Two grated iron cells, 7x8 feet each. Lighted by two windows on each of two sides of the cells.
5. No provision for ventilation except by raising and lowering the windows. The water-closets are placed in a corridor outside the cells. The sewage is conducted to a cess-pool about twelve feet outside the building. This cess-pool is covered with brick, and is ventilated by a four-inch pipe rising about four feet above the surface of the ground.
6. The water supply is a well twenty-five feet deep, distant thirty feet from the cess-pool.

Grundy County.

1. County and city jail are one. Isolated.
2. Built of wood.
3. Entirely above the ground.
4. Four cells, 8x10 feet. Lighted by one window.
5. Ventilation good. Sewage deposited in movable vessels, and carried away.
6. Sanitary condition good.

Guthrie County.

1. Jail isolated.
2. First story stone, second story brick, and occupied by the jailor.

3. Entirely above the ground; the floor of the first story resting on the earth.

4. Two cells 8x12; one cell 12x18 feet, and 7 feet high, opening into a corridor 6x18 feet. Stone partitions and iron doors. Lighted by lanterns or candles at night, and grated window in each cell, 8x16 inches.

5. Ventilation only through the windows. Sewage deposited in movable vessels and removed to a cess-pool sixty feet distant. The ventilation is bad.

6. Sanitary condition as good as can be under the circumstances.

Guthrie Center.

1. The city prison is isolated; stands in a yard where estray cattle are kept, and faces an alley.

2. Built of wood, 12x12, one story, ten feet high.

3. Entirely above the ground.

4. Two cells 9x6 feet, one cell 3x12 feet. Lighted by two 12x14 inch gratings in two cells, and one grating in the large cell.

5. No ventilation except through the gratings.

6. Sanitary condition bad. Nothing in the cells but filthy mattress tick filled with chaff, vermin and mice.

Hardin County.

1. Isolated.

2. Built of wood.

3. Entirely above ground.

4. Two cells 7x8 feet, two cells 6x7 feet, two cells 5x6 feet; corrider 14x18 feet. Lighted by small windows in outside walls, and transoms over cell doors.

5. Ventilation through the windows and transoms. Sewage deposited in vessels which are emptied daily.

6. Sanitary condition good, except cells are too small.

Henry County.

1. Jail isolated.

2. Brick, stone and iron.

3. Built entirely above the ground.

4. Large corridor, and an iron cell 16x16 feet, 7½ feet high. Well lighted.

5. Ventilation good, sewerage good, and can be flushed by water works.

6. Sanitary condition good, and embraces all the latest improvements.

Howard County.

1. Jail isolated, 100 feet from the court-house.

2. Brick.

3. Entirely above ground.

4. Two cells or cages, 6½x8½ feet, surrounded by corridor four feet wide. Lighted by four windows.

5. Ventilation by a chimney; sewage deposited in a cess-pool sixteen rods distant.

6. Sanitary condition good, as there is seldom but a single inmate and at long intervals of time.

Ida County.

1. Located in one half the basement of the court-house.

2. Stone.

3. Nearly five feet below the ground surface.

4. Three cells, with surrounding corridor.

5. Ventilation and sewerage good.

6. Sanitary condition as good as can be in an under-ground jail. No jail should be placed under a court-house.

Jones County.

1. Isolated; several blocks from the court-house. Adjoins sheriff's residence.

2. Built of stone; two stories high.

3. Entirely above the ground.

4. Five cells on the first floor and five on the second floor, 5½x6½ feet, 7 feet high. Two compartments, 15x15 feet, for insane persons. All lighted by two windows only.

5. Ventilation by the doors, and an opening 5 inches in diameter through the ceiling of the lower cells and through the roof of the upper cells. The continuous odor in the upper cells indicates bad ventilation. Sewage deposited in a covered cess-pool, and frequently disinfected.

6. Sanitary condition bad, owing to defective ventilation.

Johnson County.

1. Jail located in the basement of the court-house.

2. Built of stone.

3. One half above the ground.

4. Seven cells, 7 x 14 feet, and surrounded by a corridor on three sides. Lighted by windows in the outer walls.

5. Ventilation by grates in the upper part of partitions. Sewage deposited in a vault beneath the corridor, which has an air duct to the roof.

6. General sanitary condition good. Arrangements are being made to connect the jail with the sewerage system of the city of Iowa City.

The Iowa City city prison consists of two cells, one 7 x 6 feet, the other 22 x 30 feet, on the ground floor of a brick building. Well lighted and ventilated. Sewerage connected with city system; all conduit pipes trapped, and constant stream of water passing through them.

Jefferson County.

1. Jail isolated from the court-house.

2. Built of brick.

3. Entirely above the ground.
4. Five cells, 6 x 9 feet. No light.
5. Ventilation insufficient, and the disposition of sewage very defective.
6. Sanitary condition very bad, owing to defective drainage, and bad lighting and ventilation.

Fairfield city prison is located in the lower story of the city hall. Is all above the ground; well lighted and ventilated. Has eight cells 4x8 feet, with a hall adjoining. The sanitary condition is excellent.

Lee County.

1. Located in the basement of the court-house.
2. Built of stone. The building was primarily erected for a medical college, and was three stories high. Several years ago, a friendly cyclone tore away the upper story, which was used as a Masonic lodge. More's the pity it did not destroy the whole structure.
3. It is entirely beneath the ground—in fact it is a cellar.
4. There are two dark cells 6x10 feet, beyond the iron cages, and below the side-walk. These are not lighted at all from without, but a gas jet is kept burning. There are four rooms 8x12 feet, which are lighted by an area way.
5. There is no ventilation to the interior cells. The four large rooms get some fresh air through the grated windows of the area way.
6. There is no special dampness about the place. It is kept clean, and is in as good condition as could be expected from a cellar. It is a shame to keep people in such a place. The whole structure should be torn down, and rebuilt with reference to well known laws of sanitation.

The Keokuk city prison is a part of a fire department building; is built of brick, and entirely above the ground. There are twelve cells 7x9 feet, lighted by sky-lights, two windows and gas. Ventilation is bad, and secured by leaving a brick out of the wall, for an opening into a flue. The sewage goes directly into the city sewers, but the drainage is unsatisfactory. The premises are kept clean, floors washed twice a week, and water-closets daily disinfected with copperas solution, and walls are kept whitewashed. Yet the cells are dark, without proper ventilation, and unfit to confine a human being.

Linn County.

1. Jail isolated; but a few feet from other buildings.
2. Built entirely of brick; is attached to the sheriff's residence.
3. Is entirely above ground.
4. There are four cages, divided into three cells each. A corridor extends around the cages, six feet wide.
5. Water-closet in each cage, connected with a large cess-pool outside of the building. The cess-pool has a four-inch ventilating pipe. Pipes to water-closets are trapped, but useless, as inmates continually fill them with rubbish. Each water-closet has a flushing tank in the upper part of the cell.

5. The cells are ventilated by an opening at the top and bottom connecting with an opening over the corridor, in the roof. The cess-pool is cleaned twice a year by the odorless system.
6. The general sanitary condition is such as might be expected with defective traps, and surrounded as it is by buildings on three sides.

Louisa County.

1. Jail isolated from the court-house, but attached to the sheriff's residence.
2. Built of brick; two stories high.
3. Is entirely above ground.
4. The jail proper is a room on the first floor, 16x19 feet, 10 feet high, in which are two iron cells, 6x7 feet, 8 feet high. The second story has two cells, 16x8, intended for women. The whole are fairly lighted.
5. The ventilation is poor; all sewage is removed daily in moveable vessels.
6. The sanitary condition is above the average. An improvement in ventilation is suggested.

Marshall County.

1. Is isolated from the court-house and attached to the sheriff's residence.
2. Built of brick; one story, 20 feet, high.
3. The cells are about four feet above the ground.
4. There are ten cells, in two tiers, one above the other. On the ground floor are two stone cells, 6x10 feet, 10 feet high, for women. Over these is a cell 10x12 feet, 10 feet high. In this upper one is a steel cage about 8x10 and 8 feet high, called the "solitary." Each of the two lower cells has a grated window for lighting and ventilating, and also a water-closet connected with the city sewer system. The cell containing the "solitary" has two windows in it, its door being grated. It also has a solid iron door for complete isolation, should occasion require it. The solitary cage itself has a grating facing the grated door of the cell in which it stands, and also one directly opposite facing the two windows of the cell. It has a water-closet and a stationary wash-stand connected with the common sewer. The office room, the two female cells and the "solitary" are separated from the main part of the jail by a brick wall, there being a grated door leading from the office into the main room of the jail. This room, which is quite large, being 20x34 and about 20 feet high, contains one steel cell set on a stone floor. The room is well lighted by means of four long windows on its north and four on its south sides. Its brick walls are hollow and contain four ventilators, opening into them near the floor. It is thoroughly heated by steam. The steel cage in the middle of this room is 13 feet wide and 24 feet long, and 14 feet high. It is divided into two tiers of cells, each cell being 6x8x7 feet high. In front of each tier is a corridor 5 feet wide, 24 long and 7 high. In these the prisoners take their exercise. At the end of each of these corridors is a water-closet and stationary basin connected with the sewer. One

of the cells contains a large bath-tub and is used as a general bath room instead of a cell.

5. These cells have grated doors and windows in them for letting in light, heat and air. Each one is also connected with a ventilator which runs through the roof of the building. The disposition of the sewage is answered in number 4.

6. The general sanitary condition of our county jail is excellent in every particular. The cells are "flushed" and washed twice every week, with water from a hydrant. They are well lighted and ventilated as indicated above, and are supplied with good mattresses and bed-clothing, which are aired frequently, as well as with iron cots. The sheriff suggests that about the only thing wanting is a good padded cell for the insane, and gas or electric lights instead of the kerosene oil lamps in use at the present time.

Marshalltown City Prison.

1. Located in the lower story of the city hall.
2. Built of wood and iron.
3. Is entirely above the ground, and rests on piling.
4. There are two wooden cells, and one iron grated cage. The wooden cells are lighted by several openings; the iron cage is lighted through the grating. One wooden cell is 10x12 feet, 9 feet high; the other 8x10 feet, 9 feet high. The iron cage is 8x12 feet, 8 feet high.
5. Ventilation is had through the openings for lighting. The sewage of the small wooden cell and iron cage is removed daily in movable vessels. The large wooden cell is connected with the sewerage system of the city.
6. The general sanitary condition is good. The premises are frequently cleansed by washing and disinfected with copperas solution. More light should be provided, and all cells provided with water-closets connected with the city sewers.

Mitchell County.

1. Jail isolated from court-house. Is attached to sheriff's residence.
2. Built of brick.
3. Is entirely above the ground.
4. The jail is 30 x 28 feet, 12 feet high; cement floor. Within this area is an iron cage, 16 x 16 feet, in which are two cells. There are four windows in the outer walls.
5. Each cell has a ventilating pipe extending to the roof. The sewage is conveyed in pipes to a cess-pool outside the building, covered and ventilated. The conduit pipes are flushed from tanks above each cell. This system is defective, as the pipes frequently clog, and the result is exceedingly obnoxious to the sheriff's family and the prisoners.

Osage city prison is an isolated wooden structure, 20 x 20 feet, one story, with two cells. Sewage disposed of as in the county jail, with like results.

Muscatine County.

1. Jail isolated from court-house.
2. Built of brick and stone.
3. Entirely above the ground.
4. There are 14 cells, 13½ x 12 feet. Lighted by windows.
5. Ventilation fair. Sewage carried off by drains.
6. General sanitary condition good.

Page County.

1. Jail isolated from the court-house.
2. Built of brick
3. Entirely above ground. Is in the upper story of the building.
4. Two cells, 10x10 feet; lighted by candles.
5. Ventilation by two windows on the north and south sides. Sewage conducted in a pipe to a cess-pool, outside, and 45 feet distant from the well. The pipe is not trapped, and sewer-air from the cess-pool flows back into the jail.
6. Sanitary condition such as might be expected from the circumstances.

Polk County.

The Polk county jail is in the basement of the court-house, and is also below the level of the ground. It is old, but with the exception of the women's department is kept in repair, and is under the care of a competent jailor, who with the inspector, Judge Given, maintains a proper standard of cleanliness. Ventilation is effected by means of air shafts connecting with heated flues or with chimneys carried above the roof where cross currents can sweep over them. The waste sinks and water-closets connect with the city sewers and are protected by U traps. The air in the mens' department was fresh and in abundance when the survey was made, but gas jets were burning in the halls and entry ways to supplement the deficienct day light. The food furnished is sufficient in quantity and of a good quality. The records of the jail and testimony of its visiting medical officers do not indicate an unusual amount of disease, preventable or otherwise among its inmates, and the mortality has been low from its earliest days, but the latter is of no value in determining its sanitary condition, as it is not the practice to keep the sick in cells after they become dangerously ill.

The women's ward is not a proper receptacle for more than two prisoners, and I am of the opinion that it should be entirely abandoned. It is small, floored with wood, in close proximity to the boiler room, does not have enough light, and the water-closet is defective and unfit for use.

It is suggested that in all jails in which prisoners are detained for a longer time than 24 hours, they be compelled to take a bath on entering and be provided with a change of clothing, to be returned on leaving. In this way only can the bunks and beds be kept decently clean. Such an arrangement is in operation in all large hospitals, and no complaint is made against it. Inspector Given has also intimated to the jailors that the withdrawal of the

supply of tobacco from prisoners who discharge their saliva against the walls and floors will cure the habit. This disgusting practice is the cause of much annoyance and work to the attendants in the Polk county jail.

The single cell system is not used, except in cases of desperate prisoners. The insane are confined in a strap iron cage in the entry.

The building has stone foundations and a brick superstructure.

Des Moines city jail occupies a part of the basement of the municipal building and is below the level of the ground. It is light, well ventilated, and is kept clean by the officers in charge. The sewerage connections are faulty, but otherwise the sanitary condition is good. This jail is used exclusively as a place of detention for prisoners awaiting a hearing before the police court, and they are seldom kept in it for a longer period than thirty-six hours.

Sac County.

1. Jail under the court-house.
2. Built of stone.
3. Partly beneath the surface of the ground.
4. Two cells, 8x8 feet, 8 feet high. Lighted through grating of the doors.
5. Ventilation only such as is had through doors and windows. Sewerage carried away in buckets.
6. Sanitary condition can be improved by putting the jail above ground and isolated from the court-house.

Shelby County.

1. Isolated from the court-house and connected with the sheriff's residence.
2. Built of brick.
3. Partly below the surface of the ground.
4. Four cells 8x10 feet; two cages 8x11, located on either side of a hall. Lighted by windows and lamps.
5. Ventilation by windows. Sewage conveyed to cess-pool two hundred feet distant. Conduit pipes flushed with water from tanks over the jail.
6. Sanitary condition good.

Tama County.

1. Jail two hundred yards distant from the court-house.
2. Built of stone and brick; two stories high. Jailor occupies the second story.
3. Entirely above the ground.
4. Six cells 6x8 feet. Lighted by six windows in the corridor.
5. Ventilated by openings over the cells. Sewage conducted to a cess-pool 10x12 feet, 15 feet deep, covered, and supplied with flue 8x20 inches in size.
6. Sanitary condition as good as can be, under the circumstances.

Wayne County.

1. Jail isolated from other buildings.
2. Built of brick.
3. Is entirely above ground.
4. Four cells 8x8 feet. Lighted by windows in the corridor.
5. Each cell has a ventilating flue extending above the roof. Sewage carried off by drains, and drains properly trapped.
6. Sanitary condition good.

Webster County.

1. Jail and Ft. Dodge city prison are in the basement of the court-house.
2. Built of stone.
3. Partially under the surface of the ground.
4. Two iron cages and one cell, 12x12. Badly lighted.
5. Ventilation poor. No provision for disposal of sewage.
6. General sanitary condition bad. The jail has been condemned, and prisoners are sent to Hamilton county jail.

Wright County.

Has no jail. Belmond city prison is built of wood, 12x16 feet; sets on wooden blocks sixteen inches above ground. Two cells, 10x12 feet and 6x12 feet. Has never required lighting or to dispose of sewage. Sanitary condition good.

The foregoing is not a very commendable record, viewed simply from a humanitarian point of view; and when tested by established rules of sanitation, it is deplorable, notable that of Jones, Guthrie, Jefferson, Boone and Page counties.

While it is true, individuals are required often to surrender their rights to the public good, the State has no right to confine any person in a prison to the serious injury of his health. To pure air and sunlight every person has an unrestricted right, and no prison should be constructed that does not furnish these to every inmate. The system of cess-pools is an abomination that should not be tolerated; for they are rarely attended to as they should be. With their short ventilating pipe reaching but a few feet upward, they must per force become a nuisance, poisoning the surrounding atmosphere with their death-breeding gases. The custom of attaching jails to residences, is reprehensible. No family can have vigorous health in such proximity to such filth and vitiated air. It is clearly the duty of the legislature to provide measures by which county and city prisons shall be constructed with a proper regard to sanitation and

hygiene; that every cubic foot of cell space shall have adequate provision for light and ventilation; and cess-pools, if they must be retained, shall be constructed and maintained upon strict hygienic principles. General and simple rules upon this subject can be readily formulated, and the expense involved would be merely nominal.

METEOROLOGICAL TABLES—COMPARATIVE STATEMENTS.

1839—IOWA CITY*—1859.

Elevation above sea level, 645 feet.

	COMPARATIVE MEAN TEMPERATURE.												COMPARATIVE PRECIPITATION (INCHES).												
	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	Total for year.
1839	70 6°	75.7°	73.1°	61.1°	50.7°	35.1°	23.9°	32.2°	31.8°	40.5°	52.7°	68.9°	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1840	72.4	73.9	72.1	63.1	52.6	41.9	29.6	19.5	28.2	38.8	52.9	63.1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1841	71.1	70.4	65.5	58.5	55.0	35.2	28.8	20.9	26.1	37.1	51.0	58.1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1842	65.6	68.4	68.7	64.5	55.5	30.2	21.6	26.3	28.1	45.8	53.3	67.9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1843	67.8	70.4	70.6	64.6	42.2	34.1	31.9	25.0	13.4	15.5	47.7	58.2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1844	65.8	74.9	70 0	61.4	46.1	36.1	25.4	22.7	30.3	38.3	60.8	55.9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1845	64.3	76.0	70.8	62.9	48.5	33.3	18.2	30.0	29.9	40.4	51.1	55.5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1846	66.1	73.0	72.0	65.9	43.0	39.1	28.9	31.2	24.2	40.6	52.7	64.1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1847	62.5	69.5	65.3	59.8	47.8	33.5	25.4	12.3	25.3	29.4	49.1	55.8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1848	64 3	64.0	64.7	56.3	43 9	30.8	19.1	28.0	28.4	35.2	45.1	62.0	2.50	5.70	9.10	3.00	4.30	1.40	1.29	1.20	1.00	2.10	0.70	4.40	36.29
1849	67.6	66.5	65.3	61.7	49.0	42.9	18.4	14.3	18.1	37.6	44.3	54.8	12.20	1.40	12.20	5.60	4.80	6.60	1.14	2.82	1.30	2.41	4.70	4.70	89.27
1850	70.2	74.2	72.2	58.8	44.2	37.6	19 8	24.4	28.9	32.6	41.2	53.3	3.50	5.00	13.00	3.90	2.70	3.09	2.87	4.62	0.80	2.08	3.30	3.70	38.66
1851	46 6	71.6	69.1	58.3	50.4	34.5	21 4	24.0	27.7	38.2	43.5	58.2	14 30	8.60	14.00	3.50	1.40	3.63	2.95	1.55	5.34	3.03	3.60	12.60	74.60
1852	66 8	72.4	69.0	59.8	53.2	30.0	22 2	19.6	29.0	36.2	52.2	60.0	2.20	3.70	2.80	8.30	7.60	5.76	5.11	2.52	1.00	8.60	5.30	6.50	59.39
1853	71.2	68.8	71.1	62.2	45.5	39.7	26.7	27.1	23.4	33.2	47.8	55.7	6.40	6.60	1.70	6.20	0.21	4.92	0.32	0.43	0.90	0.76	11.80	4.60	45.08
1854	69.0	76.2	73.0	68.2	44.4	36.8	27.8	16.2	28.5	39.9	51.1	60.0	0.66	2.22	3.33	1.13	4.22	0.19	0.51	0.40	1.80	1.22	1.76	6.21	24.15
1855	67.0	73.0	70.4	67.9	47.2	37.8	21.7	24.8	15.6	30.3	54.0	66.4	4.75	2.35	3.51	1.84	2.86	2.18	2.15	1.08	0.70	1.87	2.55	1.94	29.68
1856	71.8	73.5	65.4	59.0	52.4	32.8	15.6	7.5	15.0	25.8	49 5	61.4	2.86	2.74	1.36	2.45	5.21	4.35	6.25	0.12	4.46	0.57	3.44	4.89	38.29
1857	65.1	71.2	70.9	63.8	47.9	31.2	31 4	6 2	28.8	29.9	38.3	53.9	0.90	4.67	6.00	1.80	1.35	4.77	1.85	0.61	5.80	3.33	5.09	2.75	39.62
1858	70.6	78.8	73.9	66.0	52.0	32.6	25.5	30.0	16.0	38.7	46.1	64.3	6.70	7.30	4.12	6.10	4.90	4.54	1.82	1.60	2.90	2.09	2.00	8.40	51.66
1859	69.0	72.3	68.2	60.3	37.5	39.6	15.1	24.1	25.8	40.1	43.3	62.1	5.52	2.33	1.70	1.80	6.85	1.33	1.81	0.94	1.72	5.61	1.65	7.49	32.70

*Observations were made by Prof. T. S. Parvin.

METEOROLOGICAL TABLES—CONTINUED.

1859—MUSCATINE*—1874.

Elevation above sea-level, 520 feet.

	COMPARATIVE MEAN TEMPERATURE.												COMPARATIVE PRECIPITATION (INCHES).											
	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	Total for year.
1860....	69.3	71.7	68.06	54.3	61.3	35.7	17.5	21.3	26.6	42.7	49.6	64.3	3.66	4.03	2.30	2.76	1.00	2.09	4.02	1.17	0.43	0.55	1.67	1.42	25.10
1861....	68.3	69.0	70.1	62.6	50.1	37.0	26.0	13.9	27.1	34.0	47.6	58.7	0.40	2.70	4.07	9.92	9.16	2.93	2.87	0.28	3.91	2.30	4.40	2.98	46.09
1862....	71.8	73.4	69.3	63.4	48.6	35.2	29.3	13.5	13.2	29.0	42.9	50.4	6.07	3.10	7.30	6.10	2.49	3.29	2.75	0.29	0.38	4.06	5.30	3.65	47.78
1863....	62.5	71.5	70.4	61.2	40.0	33.8	77.0	26.0	23.4	31.9	43.3	58.7	0.21	0.80	2.44	4.44	4.10	4.11	3.55	3.40	3.02	2.58	0.55	4.56	33.76
1864....	70.6	76.0	73.0	66.9	47.8	45.8	19.3	15.9	27.4	32.6	46.1	62.2	5.70	5.60	7.60	2.12	4.55	4.82	1.60	2.30	0.67	5.64	3.97	3.60	47.47
1865....	74.9	69.3	72.4	72.6	53.9	42.6	21.0	20.5	31.5	34.3	48.1	61.4	6.96	7.30	1.35	3.75	6.35	0.25	0.33	0.30	3.15	3.57	9.31	2.72	45.34
1866....	67.9	77.1	68.8	59.1	53.1	40.2	23.6	20.7	19.6	31.3	51.2	59.2	4.76	6.55	6.85	6.53	4.61	1.41	2.34	4.19	0.79	0.83	2.92	1.59	43.37
1867....	70.5	73.3	74.7	66.8	54.5	31.6	24.3	17.9	26.3	25.7	47.1	51.9	3.94	3.94	4.45	4.62	3.06	1.97	0.73	1.26	4.76	1.90	0.95	10.60	42.18
1868....	70.8	80.8	69.1	58.8	49.8	38.0	21.7	13.4	25.3	42.7	44.7	61.7	1.28	6.15	4.67	5.17	0.33	4.38	0.81	0.17	1.51	6.31	4.92	6.20	43.90
1869....	66.0	70.9	74.4	63.2	42.7	32.1	25.5	26.9	27.0	30.4	47.1	60.0	7.42	7.42	11.43	3.09	2.67	3.52	2.40	1.56	2.65	0.43	3.16	4.06	49.11
1870....	71.8	78.3	70.9	67.8	53.2	39.3	24.4	22.1	24.9	30.8	53.5	65.5	1.30	1.85	5.83	6.67	3.16	0.44	0.25	2.30	0.25	2.30	0.25	3.00	28.10
1871....	70.5	71.3	71.8	60.1	52.8	29.0	15.6	22.1	26.2	42.3	....	65.9	9.16	5.56	5.23	0.00	5.51	3.77	2.13	1.51	3.10	5.36	3.30	2.00	66.63
1872....	70.5	74.0	73.8	62.9	48.1	27.3	12.6	16.9	23.2	28.3	48.8	58.6	7.39	5.88	9.55	6.29	0.80	1.21	0.71	.....	0.24	.....	.....	7.82	.....
1873....	73.5	73.5	74 8	61.1	44.9	31.4	25.1	10.4	16.4	31.5	44.2	56.2	4.44	3.24	0 65	2 97	2.96	0.82	4.22	.....	0.30	.....	.....	5.55	.....
1874....	...	.....	.....	.....	.....	.....	.....	.....	.....	42.3	52.1	... ..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

*Observations were made by Prof. T. S. Parvin.

1874—DAVENPORT—1887.

Lat., 41° 30′ N.; Long., 90° 30′ W. Elevation above sea level, 615 feet.

1874....	72.6°	77.5°	74.3°	65.1°	52.3°	36.3°	27.9°	23.8°	25.9°	34.3°	41.2°	64.3°	5 37	3.10	3.68	7.86	1.30	2.47	0.50	4.34	0.74	1.34	2.64	3.45	36.79
1875....	68.4	73.6	69.3	61 7	48.6	33.4	34.5	9.4	10.4	30.1	45.7	60.5	4.91	9 36	1.73	4.05	1.63	0.57	3.08	0.38	1.09	0.88	2.30	2.01	27.99
1876....	69.0	75.4	74.6	62.5	49.2	35.2	14.4	29.9	30.1	32.1	56.0	62.1	4.25	4.82	4.27	5.50	1.54	2.54	0.36	3.47	3.63	4.34	5.39	6.70	46 89
1877....	69.1	75 0	72 5	67.1	53.5	37.1	42.5	16.8	36.3	28.7	49.4	61.6	5.80	3.42	3.21	1.45	4.88	2.53	2.32	1.41	0.70	3.91	3.28	2.82	35.09
1878....	68.0	78.0	74.0	65.1	51.8	42.3	20.3	30.1	36.7	48.2	54.7	57.5	4.36	2.19	5.07	1.82	4.21	0.90	.97	0.36	1.00	2.21	2.89	5.14	31.12
1879....	69.5	76 9	71.7	60.5	59.8	39.9	30.8	18.4	25.5	39.5	50.5	63.8	4 57	5.87	4.33	1.43	0.92	4.70	1.02	0.79	1.09	1.80	1.54	5.83	33.80
1880....	72.2	74.5	74.5	62.8	50.7	30 7	21.7	37.6	33.7	37.0	49.7	67.2	7.21	4.31	5.99	4.87	0 94	1.23	1.15	3.13	1.72	2 68	4.50	5.09	42.73
1881....	69.7	77.6	77.2	69.7	56.5	39.7	38.2	13.8	19.9	28.8	44.6	69.0	7.94	0.91	0.73	5.59	6.85	2 19	1.71	1.34	4.14	3.33	1.51	1.34	37.68
1882....	68.6	70.5	72.2	64.4	57.7	42.2	28 2	28.9	40.3	40.3	51.3	55.6	8.43	4.41	2.29	1.30	3.75	1.49	1.78	0.90	0.62	2.80	3.15	5.49	38.50
1883....	68.3	73.7	69.8	60.9	50.9	41.7	31.3	15.5	24.4	34.7	51.7	57.0	4.38	3 66	1.02	0 73	5.13	3.58	6.79	1.16	4.42	0.73	3.33	5.46	35.33
1884....	70.3	71.8	70.0	69.5	57.2	40.3	25.1	18.8	26.9	36.4	50.4	61.2	3 07	4.51	3.84	4.79	7.17	1.49	3.68	0.75	0.98	3.97	0.77	3.79	38.11
1885....	68.2	75.5	67.9	63.1	48.1	38.1	25.6	15.9	17.3	34.3	49.4	57.8	2.08	1.86	12.64	4.19	2.71	1.20	1.95	2.10	1.20	0.17	2.47	1.96	34.35
1886....	70.2	76.3	74.4	65.4	55.7	35.1	17.5	13.8	23.1	33.0	52.0	62.4	0.49	0.43	2.67	2.43	3.47	0.74	0.53	2.22	1.52	3.08	1.84	3.73	22 62
1887....	73.0	78.0	.....	.....	.....	.....	.....	13.2	23.8	34.3	52.3	67.1	1.43	4 87	.....	.....	.....	.....	.....	1.43	4.87	0.77	1.17	1.76	*13.93

1878—DES MOINES—1887.

Lat., 41° 35′ N.; Long., 90° 40′ W. Elevation above sea level, 849 feet.

1874....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1875....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1876....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1877....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1878....	.....	.....	78 0	68.1	50.4	42.2	19.9	.....	.....	.....	.....	.....	.....	.....	2.21	2.00	2.84	0.34	1.75	.....	.....	.....	.....	.....	.....
1879....	70.1	77.7	73.4	60.4	59.7	39.3	21.4	18.7	39.9	39.9	51.2	64.2	6.69	0.29	1.98	2.79	3.15	6.49	1.39	0.69	1.68	1.68	1.03	4.74	32.60
1880....	71.8	74.4	73.1	62.2	49.2	28.2	20 1	38.2	38.0	38.0	50.5	68.5	4.11	3.82	6.69	5.34	4.90	1.97	0.86	0.73	0.70	0.70	1.56	5 84	37.22
1881....	70.6	76.2	77.9	66.2	54.7	35.8	35.0	14.0	28.9	28.9	43.4	66.8	15.79	5.57	5.29	4 70	6.45	3.97	1.85	1.55	1.78	1.78	3 36	3.82	55.91
1882....	67.9	68.4	71.1	94.2	55.4	39.3	23.9	26.7	37.8	37.8	51.1	54.8	12.16	4.78	3.14	0.15	5.94	2.81	2.50	0.63	2.28	2.28	3.47	8.53	48.67
1883....	67.5	73.6	69.7	59.3	48.7	48.7	27.3	8.8	19.1	32.9	51.8	55.8	7.75	2.37	2.83	1.88	4.42	4.42	1.08	1.72	2.51	0.57	3.48	9.76	41.79
1884....	70.0	71.8	68.7	67.9	55.6	37.6	18.4	16.0	21.5	33.8	41.7	59.8	3.84	2.16	3.84	5.46	5.33	1.26	1.93	0.85	0.04	2.24	2.97	4.34	34.28
1885....	69.0	75.9	68.7	63.5	48.8	39.2	28.4	11.5	14.6	36.6	49.0	59.1	5.03	6.55	5.10	4.82	4.17	0.61	1.96	1.00	0.42	0.04	3.62	1.70	35.02
1886....	71.3	78.4	.....	.....	.....	.....	.....	10.9	24.8	34.9	52.7	64.4	1.21	0.27	1.10	7.90	2.62	1.86	0.81	3.44	0.52	1.41	4.32	3.71	29.17
1887....	71.9	77.5	.....	.....	.....	.....	.....	11.5	19.4	35.7	52.5	65.7	2.25	1.97	.....	.....	.....	.....	.....	0.83	1.65	1.79	2.48	2.31	*11.31

* January to July.

METEOROLOGICAL TABLES—CONTINUED.

1874—DUBUQUE—1887.

Lat., 42° 30′ N.; Long., 90° 44′ W. Elevation above sea level, 665 feet.

	COMPARATIVE MEAN TEMPERATURE.												COMPARATIVE PRECIPITATION (INCHES).											
	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	Total for year.
1874....	72.5°	78.3°	74.3°	65.2°	52.0°	34.4°	29.6°	21.2°	23.2°	33.2°	41.3°	65.2°	3.30	3.34	2.13	7.68	2.14	4.17	0.65	2.45	0.36	1.28	1.54	1.08	30.12
1875....	67.5	73.3	69.7	61.7	52.1	33.7	33 9	6.6	6.1	27.5	45.0	60 9	4.75	5.39	1.07	7.11	2.71	0.48	2 71	1.00	2.12	1.45	2.71	3.62	35.12
1876....	69.1	74.9	73.8	61.4	47.6	34.1	13.7	27.8	27.8	31.0	48.6	61 6	7.88	8.15	5.92	5.00	1.10	2.49	0.52	3.20	1.53	4.00	3.63	5.96	50.28
1877....	67.7	74.7	73.0	66.2	51.7	35.0	46.0	15.2	34.8	27.1	48.2	62.2	6.75	2.90	3.96	0.67	5.35	3.31	2.70	0.96	0.26	4.53	3.74	3.84	38.07
1878....	66.8	76.8	73.7	63.8	49.9	39.7	19.5	27.7	35.3	45.4	53.6	56.0	4.35	6.71	1.72	6.94	2.85	0 76	1.12	0.49	1.93	2.44	4.34	4.61	38.26
1879....	68.9	76.6	71.6	59.4	58.7	37.4	20.3	17.4	22.8	37.2	50.7	62.6	4.99	6.78	2.43	2.98	0.93	5.41	1.28	0.44	1.00	1.20	2.02	2.94	22.51
1880....	71.1	74.2	72.8	61.2	48.7	27.8	19.1	34.4	29.1	35.6	48.8	67.4	6.02	3.55	7.15	6.84	0 66	2.11	1.25	1.95	1.01	2.55	3.52	3.72	31.54
1881....	67.6	75.2	74.5	66.3	03.3	36.2	34.7	12.5	20.1	30.4	43.9	67.7	7.56	10.53	2.46	10.26	6.70	3.19	1.55	1.87	3.70	3.78	1.30	2.20	42.40
1882....	67.2	69.0	71.6	62.6	55.3	39.2	23.4	24.1	35.7	37.0	48.5	54.4	6.29	1.48	2.29	2.60	5.29	1.55	1.79	0.84	0.59	1.49	4.47	4.16	41.13
1883....	67.7	72.5	68.5	58.8	53.3	38.5	27.0	10.2	18.8	30.9	49.7	54.6	5.34	7.90	2.70	2.09	4.44	1.65	1.88	1.59	2.60	0 32	1.93	7.13	39.65
1884....	68.6	70.0	68.4	67.8	53.6	36.3	21.3	14.1	22.2	32.2	48.4	60.6	4.89	5.30	4.25	4.07	4.16	1.43	4.08	0.99	2.19	3.85	2.77	4.88	31.98
1885....	69.0	75.9	68.8	63.5	55.1	39.2	28.4	12.3	13.3	30.3	47.2	56.7	6.16	6.16	8.07	4.58	2.30	0.64	3.14	1.80	0.72	0.41	3.69	2.62	34.11
1886....	71.3	78.4	76.8	65.1	48.8	35.8	19.2	10.9	21.8	31.3	51.0	61.1	0.71	0.89	0 67	2.10	4.08	1.89	1.03	3.17	1.36	4.32	2.12	4.17	29.66
1887....	71.9	77.5	.....	.....	57.3	.....	.....	11.5	20.7	32.4	50.7	66.6	1.32	2.44	.....	.....	.....	.....	.....	3.33	3.56	1.80	1.37	2.53	*13.91

1874—KEOKUK—1887.

1874....	75.5	80.4	76.7	67.0	55.4	36.7	31.2	27.7	29.4	38.0	44.0	66.7	4.61	4.61	3.87	7.92	1.84	2.17	1.26	3 82	0.88	0.14	2.40	1.65	34.77
1875....	71.0	75.5	70.3	63.8	50.6	35.1	36.5	16.3	18.4	33.8	48.9	61.8	8.33	12.70	3.83	4.30	2.71	0 59	3.93	0.61	1.84	1.67	0 89	6.70	48.10
1876....	69.7	76.4	75.8	64.4	51.8	36.2	18.8	33.8	34.2	34.6	52.6	63.5	6.61	6.79	4.13	11.08	2.12	2.82	0 23	3.68	1.45	3.45	4.07	5.28	31.71
1877....	71.4	76.9	74.3	69.8	55.3	38.9	42.9	22.0	38.0	32.5	50.7	62.1	7.82	6.90	2.52	3.61	7.01	3.05	3 90	0.51	0 15	3.76	4.22	5.55	49.19
1878....	70.6	81.5	77.7	67 3	54.3	44.0	23.8	34 9	38.4	50 4	58.8	60.2	3.93	2.37	5.27	1.36	2.31	1.93	1.95	0.16	2.95	3.78	2.31	3.47	31.78
1879....	72.1	80.6	75.0	62.9	61.6	42.7	26 9	22.6	29.8	42 6	52.2	66.8	2.43	1.98	4.57	1.12	0 28	3.91	1.45	0 50	0.53	1.72	1.55	1.46	22 51
1880....	73.9	77.7	77.5	65.4	51.2	31.5	24.1	41.3	36.3	40.0	53.8	68.9	3.06	2.25	3.81	3.21	2 02	1.13	0.67	3.91	1.94	1.83	4.79	5.92	34.84
1881....	72.7	79.9	70.2	72.4	57.0	39.6	37.6	18.8	24 9	33.7	46 8	69.8	8.70	3.08	0.86	4.10	8.01	2.59	1.70	0.50	2.58	2.42	3.12	6.65	42.30
1882....	71.1	72.4	73.4	66.1	58.6	42.8	27.7	28.1	39.5	41.7	53.7	56.8	9.44	4 53	3.09	2.52	2 71	2.25	1.75	1.07	1.54	3.30	3 22	7.11	41 53
1883....	69.7	76 0	71.2	62.7	51.5	42.8	31.8	15.5	24.9	35.3	54.0	59.8	5.88	3.15	1.34	1.76	6.95	2.09	1.20	1.24	6.13	1.07	2.97	4.87	38.65
1884....	71.5	75 0	72.0	71.1	58.4	40 6	23.0	18.7	27.5	37.3	50 6	62.3	4.03	2.30	2.74	4.25	3.35	1.73	3.91	0.85	1.88	3.37	1.31	3.16	31.98
1885....	70.4	78.5	70.0	64.6	49.4	40.6	28.7	16.3	16 4	34.7	49.7	60.6	6.97	2.29	5.98	3.77	2.59	0.88	1.96	2.44	1.14	0.17	2.33	2.59	34.11
1886....	70.7	77.5	77.1	68 2	57.6	38.5	2 13	14.7	26 2	26 5	53.6	64.1	2.86	0.65	5.90	3.94	2.38	1.15	1.03	2.08	1.40	2.25	1.52	4.49	29.66
1887....	72.8	79.1	.....	.....	.....	.....	..	19.1	29.5	38 4	53.6	66.5	1.44	1.57	.....	.....	.....	.....	.....	1.48	5.19	0.76	1.84	2.54	*13.25

* January to July.

1874—OMAHA—1887.*

Latitude 41°, 16′, N. Longitude 96°, 0′, W. Elevation above sea level, 1,113 feet.

1874..	73.1°	79 6°	77.2°	62.7°	53.6°	36.0°	28.2°	22.2°	23.6°	33.1°	44.7°	66.1°	6.93	0.54	2.08	7.18	1.45	1.05	0.54	0.32	0.92	1.49	2.01	1.24	25.75
1875..	70.9	74.2	70.0	62.5	47.6	32.6	33.9	10 8	25.7	30.2	44.9	62.9	10.95	10.01	7.77	2.55	1.16	0.13	1.00	0.26	0.51	1.24	3.06	4.25	39.89
1876..	68.2	75.2	74.9	62.2	49.9	33.1	19.0	26.7	30.4	29.2	51.1	63.0	3.47	7.30	6.27	4.93	0.69	1.17	0.16	0.23	0.40	3 18	2.65	2.07	32.51
1877..	69.1	75.6	72.6	68.4	51 2	36 0	38.9	20.2	37.3	33.9	50.1	60.3	8.30	0.96	3.13	2.05	5.86	1.39	2.14	0.53	0.44	1.26	6 24	8.62	40.92
1878..	69.7	79.0	76 8	64.1	52.0	43.8	21.5	28.8	36.7	47.9	54.6	58.1	8.48	7.66	2.48	3.22	0.55	0.29	0.27	1.13	0.14	3 09	3.97	5.77	37.05
1879..	72.7	78.5	75.0	62.5	61.5	40.3	17.3	21.7	26.8	41.0	53.6	60.8	4.09	3.17	1.51	1.43	3.64	4.25	1.75	0 07	0.93	2.17	1.77	5.53	30.41
1880..	73.0	76.7	74.2	62.9	49 2	26.4	18.4	34.5	30 9	35.9	51.2	69.4	3.14	5.36	7.10	2.91	3.54	1.70	0.28	0.90	0.14	0.50	0.55	3.40	29.52
1881..	74.9	78.9	80.2	66.0	54.4	36.9	36.0	11.8	17.9	27.6	44.4	67.8	5.56	5.89	1.65	8.36	4.84	1.29	1.56	0.61	3.09	0.72	4.23	7.94	45.75
1882..	71.0	71.7	73.1	67.5	57.2	39.7	24.6	27.5	36 3	40 2	52.0	56.6	12.05	6.76	0.95	0.51	5.09	1.42	0.92	0 74	6.60	0.79	4.91	4.91	45.59
1883..	69.1	75.7	71.3	60.8	49.4	39.2	28.6	11.9	21.7	34.6	53.6	57.3	12.70	4.79	3.39	4.53	5.03	0.64	0.73	1.01	1.00	0.52	3.20	11.29	48.83
1884..	72.3	74.5	70 3	68.6	57.3	39.3	17.3	17.0	19.4	35.3	47.5	61.6	6.11	10.35	7.07	4.91	5.81	0.32	0.72	0.73	1.42	4.91	3.88	1.45	47.68
1885..	71.2	77.0	69.9	64.5	49.8	39.9	28.6	12.2	16.6	36.1	50.1	59.8	2.67	9 24	6.99	2.50	3.86	0.73	1.17	0.41	0.47	0.33	0.34	4.43	33.14
1886..	70.2	77.3	75.6	65.1	58.3	34.3	17.9	11.9	24.4	31.9	50.9	65.1	1.50	0 69	4.53	4.45	1.33	1.54	1.46	1.15	0.36	1.31	7.77	4.58	24.67
1887..	72.4	76.3	....	....	....	....	....	11.8	18.2	38.0	54.5	66.1	4.56	2.02	.....	.....	.....	.....	.....	0.49	1.00	0.48	0.88	1.39	†8.80

* The observations made at Omaha represent the western portion of the State.

† January to July.

NORMALS OF TEMPERATURES FOR TWENTY YEARS.

The following table is compiled from observations of Prof. T. S. Parvin, from 1861 to 1871, and from those of Prof. G. Hinrichs, of the Iowa Weather Service, from 1871 to 1880, and are the result of nearly thirty thousand observations, which were made at Iowa City. The values given, are for each decade of each month.

MEAN TEMPERATURE, DEGREES F.				MONTHS.	RAIN-FALL IN INCHES.			
I	II	III	Month.		I	II	III	Month.
.52	.60	.60	1.72	January	18.7	19.1	20.3	19.4
.55	.55	.70	1.80	February	22.0	24.4	27.1	24.4
.80	.95	1.10	2.85	March	29.6	32.2	37.3	33.1
1.20	1.20	1.10	3.50	April	43.3	47.9	51.6	47.6
1.20	1.20	1.35	3.75	May	55.5	60 0	63.8	59.9
1.65	1.65	1.55	4.85	June	66.3	68.8	71.8	69.0
1.65	1.27	1.20	4.12	July	73.7	74.1	73.8	73.9
1.42	1.65	1.85	4.92	August	73.1	71.8	69.6	71.2
1.80	1.55	1.25	4.60	September	66.4	62.9	59.4	62.9
1.10	.95	.90	2.95	October	55 0	50.3	45.1	49.9
.95	.82	.70	2.47	November	40.7	35.8	29.2	35.3
.60	.50	.50	1.60	December	26 3	23.2	20.2	23.1
Total			39.13	The year—mean				47.47

OBITUARY.

At a special meeting of the State Board, held February 1, 1887, the following memorial was presented and unanimously adopted:

The President of this Board, Dr. W. S. Robertson, who has been its presiding officer since its organization, in 1880, died at his home in Muscatine, January 20, 1887. It is fitting that this Board express its estimate of its loss, and its appreciation of his worth as a man, his ability as a physician; his efforts to promote sanitary reform; his fitness as a teacher; his philanthropic efforts to ameliorate the condition of a most unfortunate class, and his patriotism and valor as a soldier during the late war.

As a physician he ranked among the foremost in the State. Clear-headed, far-seeing, accurate in judgment, skillful in treatment, wise in counsel, he added to those qualifications a geniality of character, and a sympathy of feeling which brought hope and comfort to the sick. No man was more highly esteemed and loved by his patients. Tears fell from many eyes as the throng of sorrowing friends passed by his bier to look for the last time upon the face of the dead.

As a teacher of medical science he was connected with the medical department of the State University of Iowa since its organization, and was one of the ablest and most faithful members of the faculty. He advocated a high standard of literary and professional education. He was an active and prominent member of national, State and county medical societies, and contributed by word and pen to their success.

As a philanthropist his attention was early drawn to that unfortunate class of children whose intellectual progress had not kept pace with their physical growth. He conceived the plan of establishing an asylum where this class might be gathered and be afforded the care of the State and all the educational growth of which their condition admitted. With this end in view, he spared neither time nor labor. The asylum for Feeble Minded Children is largely the result of his persistent zeal, and is a lasting monument to his philanthropy.

As a sanitarian he was becoming well known. For years he labored for the establishment of a State Board of Health, and when, by the efforts of himself and others, this Board was created by the Legislature, he became its first, and up to this time its only president. We, who were his colleagues know with what tireless energy he labored for the advancement of sanitary reform; for the education of the people in sanitary matters; his wisdom as

a presiding officer; his courteous discharge of his duties. His life has been one of large activities, of abounding usefulness, of good and generous deeds. Taken away in the prime of his power, he has left us the example of his works. A Christian gentleman, a faithful friend, a skillful physician, a wise teacher, an ardent philanthropist, a conservator of the public health, a lover of his country, we can, in bidding him a last farewell, fitly say in the words of his pastor at his burial, "Well done, good and faithful servant." To his bereaved family we extend our heartfelt sympathy and trust that He who gave the blow may comfort and sustain them in this hour of need.

The Secretary presented the following memorial sketch of the deceased President:

William Stephenson Robertson, son of Dr. James M. Robertson and Maria (*nee* Armstrong) Robertson, was born at Georgetown, Lancaster county, Pa., June 5, 1831.

When about seven years of age he came with his parents to the Territory of Iowa—making his home at Burlington. Here his early days were spent—being thrown much of the time with the native Indians, whose language he learned so well that he was frequently called upon by the Territorial officers to act as interpreter. He received here such a common school education as the country afforded. At the age of thirteen his father moved to Columbus City, where he continued his studies and whence later he went to Knox College, in Illinois—seeking a higher education. Owing, however, to impaired health, he was obliged to relinquish his college studies and spend a year at home to recuperate. He returned to Knox, but was again obliged to leave not to return. In 1852 he entered the office of his father, then and for many years a physician of large experience and excellent judgment, as a medical student.

In the autumn of 1854 he entered upon his first course of medical lectures at Jefferson Medical College, Philadelphia, and, returning in 1855, he graduated March 8, 1856. Immediately upon receiving his degree he located at Columbus City, his old home, and there entered upon his brilliant professional and public career. Here he remained for twelve years in the enjoyment of a large and remunerative practice. On the outbreak of the late rebellion he recruited the first company raised in the State and tendered it to the Governor, though from some cause the company was not accepted until a later date. He was mustered into the United States service as major of the Fifth Iowa Volunteer Infantry, on June 13, 1861, and served his country with distinguished bravery. Upon the death of Col. Worthington, Major Robertson was elected colonel of the regiment. At this juncture he resigned his commission as major, was called home on very important business, did not return to the service, and resumed his practice at Columbus Junction. Progressive in his ideas—determined to stand in the front ranks of his profession, and not satisfied with the knowledge gleaned from his medical journals which were the best he could procure, and from his practice, extensive as it was, he spent the winter of 1868-9 in the hospitals of

New York City under the special direction of Prof. Frank H. Hamilton. On his return from New York he sold his property in Columbus City and removed to Muscatine in the spring of 1869, where he remained in uninterrupted practice until the time of his heath. Upon the organization of the Medical Department of the Iowa State University he was tendered and accepted the chair of "Theory and Practice of Medicine and Clinical Medicine," the duties of which he performed until a few weeks since with great acceptability. He was a humanitairan and always alive to the interests of the public health. He contributed more than any other one man in the State to the founding of the "Home for the Feeble Minded" at Glenwood, an institution that is the pride of the State, though less pretentious than many others. At the organization of the Iowa State Board of Health in 1880, he was appointed a member, and was elected President of the Board, and re-elected to the position annually thereafter. He was also President of the State Board of Medical Examiners. He was for many years an active member, and had been also President of the Iowa State Medical Society; also a member of the American Medical Association and American Public Health Association. He was an active member of the Iowa and Illinois Central District Medical Association, and of the Muscatine County Medical Society. He was a prominent member of the G. A. R., and a Knight Templar, being at the time of his death Eminent Commander of DeMolay Commandery No. 1, of Muscatine. He was an honored member and liberal contributor to the Presbyterian church. In all these varied positions he was recognized as a worthy comrade and a brother beloved—his genial nature and social qualities being such as to make him deservingly popular. He was a husband and father greatly beloved—a man and a citizen whose example is worthy of imitation.

He was the author of several medical pamphlets, among them the following: "Medical Inhalation," "Thermometry in Disease," "Sanitary Science and Public Hygiene," and "Over-Pressure in Schools." His busy, active life and his too early death illustrates the danger of "Over-Pressure" out of school. One of his chosen maxims was, "It is better to wear out than to rust out." After an illness of about two months, induced largely by overwork, he died at his home January 20, 1887.

To this Board of Health his untimely death comes with a crushing weight. His vital, absorbing interest in sanitary science, his excellent judgment and impartiality as presiding officer, his large-hearted concern for his colleagues on the Board, his commanding and inspiring presence will be sadly missed. His last official message to the Secretary of the Board, dictated in tremulous accents, was, "I wish you would prepare a brief, cogent appeal and send it to the physicians of the State urging them to make full and faithful reports of vital statistics."

CIRCULARS

ISSUED BY THE

STATE BOARD OF HEALTH.

TYPHOID FEVER.

ITS CAUSES AND PREVENTION.

[Read before the Board by J. F. Kennedy, A. M., M. D., Secretary.]

The records in the office of the Iowa State Board of Health show that in the year 1883, one hundred and fourteen males and ninety-nine females, or two hundred and fourteen persons died of typhoid fever within the State of Iowa. It is estimated that not more than fifty per cent of the cases resulting fatally were reported.

The deaths from this disease average about one in every ten cases. It is therefore fair to presume that nearly five thousand cases of this lingering and largely fatal disease, occurred in this State during the year alluded to.

Another important fact is, that almost three-fifths of these deaths were of persons between the ages of ten and thirty years—years full of promise. As sickness and death are such important items in the great sum of wasted resources, as well as of blasted hopes; and on the other hand, as "public health is public wealth," it becomes us as intelligent members of the commonwealth, to prevent so far as possible, this unnecessary sickness and mortality.

The cause of typhoid fever is getting to be so indisputably and definitely settled, and so generally recognized that there is a growing conviction among sanitarians that it has no right to exist among intelligent people.

It is not usually considered a contagious disease in the sense that small-pox and measles are, yet it has been fully and frequently demonstrated that foul odors, arising from soiled bedding and clothing, and from typhoid excreta, can and have produced the disease in others.

The theory held and promulgated by the most eminent sanitarians, and most careful and conscientious observers is that the disease is the result of a special contagium.

It is further demonstrated that this specific poison is always present in the discharges from the bowels of typhoid fever patients, and possibly in that from the kidneys. It is generally believed that these excreta are comparatively innocuous when first discharged, but that soon after, by a peculiar fermentative process, they acquire their dangerous character.

This disease germ, or contagium, of typhoid fever is not only developed or vitalized after being thrown from the bowels, but seems to be indefinitely multiplied under the favoring conditions of heat, moisture and filth.

It is a well admitted fact that in a large majority of instances the disease germ is introduced into the intestinal track by means of food and drink—especially by contaminated water. The discharges are thrown into the privy-vault, or as was the case in the late terrible epidemic at Plymouth, Pennsylvania, upon the ground—in either case, by percolation or by drainage, finding their way into the family well, or into the public reservoir. The drinking of this water; its use for cleansing (?) milk-cans, or for diluting milk; or the use of milk that has been exposed to air contaminated with the typhoid poison; the dissemination of sewer gas charged with noxious fever germs throughout dwelling houses badly plumbed; and the leachings from decomposing typhoid bodies into wells contiguous to cemeteries, are the more common and direct means by which the disease is propagated. There are cases on record where typhoid discharges were thrown upon the manure pile during the winter. The disease germ survived the rigors of winter, and when the heat and moisture of spring came, those who removed the manure were stricken down with the disease in a most malignant form.

In the case at Plymouth, referred to, the discharges from a typhoid fever case were thrown upon the frozen ground and snow, and in March the melted snow laden with the disease products of these excreta, found its way into the reservoir, and thence to families supplied with this water. The result was, in a few days one thousand one hundred cases of typhoid fever occurred, one hundred and seven of whom died. The causes leading to this outbreak were most thoroughly investigated, with every possible source of error eliminated, by the local physicians, as well as by physicians of Philadelphia and elsewhere, and the unanimous and indubitable conclusion was reached that it had its origin as above stated.

It has been demonstrated that the disease is most prevalent when

the water used for drinking purposes is taken from wells in which the water is very low—the poison produced by the fever germ thereby being rendered more concentrated, and hence more noxious.

It is especially important that the fact that the presence of the special contagium of typhoid fever is necessary to produce the disease be kept in mind, since there are so many well authenticated cases where water highly polluted has been used, and though other filth diseases resulted, typhoid fever did not occur until the water became contaminated with the specific contagium.

It is fair to state that the germ theory of the cause of typhoid fever is not *universally* admitted, and yet there is perhaps at the present day, no better working theory from a sanitary point of view.

The nature of this typhoid poison has been carefully investigated by eminent microscopists. Klebs, von Recklinghausen, Myers, Koch, Eberth, Klien, Ziegler, Tayon, Friedlander, Wenrich and Gaffky, all describe the presence of a special bacillus in typhoid fever. These bacilli were cultivated outside the body, and their experiments show that the typhoid bacilli are not *limited* to a parasitic mode of life in the bodies of human patients. They could be cultivated on the surface of boiled potatoes, milk, blood serum, meatbroth, and especially human excrement. Since these bacilli are invariably found in the diseased intestines and the internal organs during the progressive stages of typhoid fever, and since they have never been found in any other disease, their causal relation to the disease is extremely probable, if not absolutely proven.

Typhoid Fever from Milk.—There have been several notable epidemics of typhoid fever in this and other countries, caused by the contamination of milk. The disease germs are imparted either by the absorption of noxious exhalations from sewers, or from the soiled body linen of typhoid patients.

From the foregoing statements relative to the cause of typhoid fever, it is apparent that there is no sentence, nor number of sentences, that so happily and aptly expresses the most complete sanitary environment as the old one of Hyppocrates—"pure air, pure water, and pure soil."

Prevention.—Whatever will most promptly and efficiently prevent the contamination, and promote the purification of the air, water and soil, naturally suggests itself as the best means of preventing and restricting the spread of typhoid fever.

The Hygienic Council of the French Academy of Medicine fearing

direct contagion, demand in all cases (1) isolation, (2) aeration of the chambers; (3) disinfection of the evacuations; (4) disinfection of the clothing; (5) disinfection of the room.

If the following rules were faithfully practiced, the number of cases of typhoid fever would be greatly lessened, and in time, the disease would be stamped out.

I. Strict cleanliness of homes and surroundings, including the burning of decaying chips and saw-dust, and the removal of decaying vegetables from the cellar.

II. Have all sewers and drain pipes connecting with the premises well trapped, and cess-pools and privy-vaults abolished, or at least one hundred feet from any well used for drinking or dairy purposes. The use of the dry-earth closet is greatly to be preferred to the ordinary privy-vault.

III. Isolation of the patient should be as rigidly enforced as possible, as much for the good of the patient as for that of the public. The drinking water, sewer connections and milk should also be critically examined with a view to ascertain the origin of the disease. Every case should at once be reported to the local board of health, as dangerous to the public health.

IV. All discharges of the patient should at once be disinfected, by being well mixed a solution of corrosive sublimate (two drachms to one gallon of soft water), or with a solution of copperas (three pounds to a gallon of warm water), and if possible, buried rather than thrown into the sewer or privy-vault. The corrosive sublimate solution, in the strength given above, should be kept in a large bottle or demijohn, properly labelled, and given to the nurse. Each evacuation immediately after its passage, should be covered with this solution and allowed to remain for fifteen minutes. A small quantity should be kept in the bed-pan in the interval of its use. Patients in no stage of the disease, even if able, should be allowed the use of the water-closet.

V. The water and milk used for drinking purposes during the run of the disease in a family should be boiled, and *the sale of milk from such infected premises should be prohibited.*

VI. Disinfection of clothing and bedding which can be washed, can be done in no better way than to put it through the ordinary operations of the laundry. Boiling for an hour will destroy the vitality of all known disease germs. Soiled clothing on removal from the person or bed of the sick should be *immediately* immersed in boiling water, or in a solution of corrosive sublimate (two drachms to one gallon of soft water).

VII. After death or recovery, the thorough disinfection and fumigation of the patient's room, and all its contents, should be enforced. To fumigate a room effectively, three pounds of sulphur should be burned in a room ten feet square. Every opening in the room, including flue, except one door, should be closed tight, and the furniture and contents of the room so arranged as to admit, as far as possible, the contact of the fumes on all sides. The sulphur should be placed in a shallow iron pan, and these on a couple of bricks in a tub containing water. Coal oil or alcohol should be poured on the sulphur, and a match applied. The person igniting the sulphur should at once leave the room, as the fumes are highly poisonous; and the door should be tightly closed. The room should remain closed twenty-four hours. A great many, with large experience and careful observation, place but little confidence in the sulphur fumigation. It is, if effectual at all, only so when done *thoroughly*. A more certain method, though destructive to wall-paper, is to thoroughly wash the walls and wood-work of the room with the corrosive sublimate solution (two drachms to one gallon of warm water). After washing the wood work, a coat of paint and varnish would "make assurance doubly sure."

VIII. The privy-vault and cess-pool, if any, whether the disease is present or not, should be disinfected at least *once every week* with a solution of copperas (one and one-half pounds to a gallon of water). One of the best and cheapest disinfectants is chloride of lime, which can be used in the proportion of one fourth pound to a gallon of soft water.

IX. Good food; proper clothing; the avoidance of over work, mental or physical; in fact whatever conduces to the best physical condition, contributes most largely to the powers of the system to successfully resist the encroachments of this disease.

X. The discovery and practical application of some simple and inexpensive method for the cremation of filth and garbage, and the combustion therewith of the offensive and noxious gases caused by such cremation, will reduce to the minimum the present fearful rate of sickness and death from preventable causes.

SCARLET FEVER AND DIPHTHERIA.

THEIR RESTRICTION AND PREVENTION.

TO LOCAL BOARDS OF HEALTH.

Householders, physicians, and Boards of Health, have duties to the public, and in order that the guardians of the public health may have early warning, it is important that every case of contagious disease be promptly reported to the local board of Health. The following regulations should, therefore, be adopted by local boards of health, and public notice thereof be given:

"Whenever any *householder* shall know that any person within his family is taken sick with the small-pox, scarlet fever, diphtheria, *or any other disease dangerous to the public health*, he shall immediately *give notice thereof to the board of health*, or to the *health officer;* and if he shall refuse or neglect to give such notice he shall forfeit a sum not less than twenty-five dollars."

"Whenever any *physician* shall know that any person whom he is called to visit is infected with small-pox, scarlet fever, diphtheria, *or any other disease dangerous to the public health*, such physician shall immediately *give notice* thereof to the board of health, or health officer; and every physician who shall refuse or neglect to give such notice shall forfeit a sum not less than twenty-five dollars."

When *any disease dangerous to the public health* is found to exist in any township, city, or town, *the board of health must use all possible care to prevent the spreading of the infection*, and to give *public notice of infected places*, by such means as in their judgment shall be the most effectual for the common safety.

Local boards of health must make such regulations as they may deem necessary for the public health and safety respecting any *articles which are capable of containing or conveying any infection or contagion, or of creating any sickness*, or when such articles shall be brought into or conveyed from their jurisdiction; and if any person shall violate any such regulation he should forfeit a sum not less than twenty-five dollars.

The general laws of this State provides that the mayor and aldermen of cities, and the trustees of townships, "shall have and exercise all the powers, and perform all the duties of a board of health, as provided in Chapter 151, Laws of 1880." (1)

(1) "I have no doubt but a city, town, or township officer, could be indicted for a misdemeanor, and Section 3965 of the Code of 1873 is the one under which an indictment could be found for a refusal to obey Chapter 151, Laws of 1880. Section 13, Chapter 151, Laws of 1880, when viewed alone would seem to be a statute directory in its character, but when considered in connection with other sections I am of the opinion that it is mandatory."—*Decision of the Attorney-General, January* 25, 1881.

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, small-pox, or scarlet fever, he shall be punished by a fine of not more than one hundred dollars, or by imprisonment in the county jail not more than thirty days.—*Chapter* 102, *Laws of* 1884.

The presumption of the law is, they will perform all the duties contemplated by the statute to protect the community within their jurisdiction from contagious and infectious diseases, and from all causes of sickness within their power. Short of this, they have not complied with the object and intent of the law, and the people for whose benefit the laws were enacted have the right to demand that the proper authorities shall perform their duty, and afford them the immunities contemplated by the statute for their restriction and prevention.

The local board of health and the physician in charge of cases of contagious disease should co-operate for its restriction. The local board of health must particularly guard against its spread where no intelligent physician is employed.

NATURE OF THE DISEASES.

SCARLET FEVER.

Scarlet fever is now believed to be 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.

DIPHTHERIA.

Diphtheria is a most formidable disease, is widely prevalent, and one of the most fatal diseases in this State. It is, primarily or secondarily, a constitutional, or blood-poisoning disease. It attacks persons of all classes and ages, but most frequently children under sixteen years of age.

In ordinary cases the poisonous principal of diphtheria probably enters the blood 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.

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.

CONTAGIOUS PRINCIPLE.

The specific contagia developed by these diseases, and by which they spread, are diffused by the exhalations (breath, perspirations, etc.,) of the patient through the air immediately surrounding him or her; and in scarlet fever also by the scales thrown off. They may be conveyed by anything that has come in contact with an infected person; also by food, clothing, sheets, blankets, furniture, toys, books, wall paper, curtains, hair, whiskers, cats, dogs, and kissing.

As a rule, the virulence or malignancy of the contagium of each disease is in direct proportion to the severity of the case from which it emanates, though malignant cases may result from exposure to a mild case.

The more this contagium is allowed to accumulate in the room where the patient lies, the more powerful does it become.

RULES AND REGULATIONS.(1)

DANGER SIGNALS.

Upon notice being given to the board of health of a township, city or town, or to the health physician thereof, or whenever any member of said board, or the health physician shall have knowledge of any cases of scarlet fever or diphtheria within their jurisdiction, such member of said board or the health physician, must cause a

(1) "Rules and Regulations made by the State Board of Health, and directed to local boards of cities, towns and townships, are of full force and effect upon the people, without subsequent indorsement or action of such local boards."—*Decision of the Attorney-General, January* 4, 1881.

To give still further force and effect, these Rules and Regulations should be adopted by the local boards.

yellow cloth, or card having "scarlet fever" or "diphtheria," as the case may be, conspicuously printed thereon, not less than eighteen inches square, to be fastened upon the front door, or other conspicuous place of each building in which said sickness prevails, said cloth or card to be maintained during the existence of the disease, and until such time as the health physician is satisfied the premises have been properly cleaned, disinfected and purified. If said yellow cloth or card is removed without authority from the health physician, the name of the person, or head of the family occupying the premises, together with the number of the street, or location shall be published, and the person removing said cloth or card, or causing its removal without authority of the health physician, shall be fined a sum not less than twenty-five dollars.

ISOLATION.

Separation of the sick from the well.—Whenever a child has sore throat and fever, and especially when this is accompanied by a rash on the body, the child must be immediately isolated as completely as possible from other members of the household, and from other persons, until a physician has seen it and determined whether it has scarlet fever or diphtheria. All persons known to be sick with either disease must be promptly and thoroughly isolated from the public not less than thirty-five days.(1)

No such person must be permitted to associate with others, nor attend school, church, nor any public assembly, until in the judgment of a careful and intelligent physician he or she can do so without endangering others. It is always better to isolate individuals and families than to close schools, and thereby allow the children to inter-visit, and be thrown together on the play grounds. In cases where the disease assumes an epidemic form, schools must be closed, and all public gatherings prohibited.

CARE OF THE SICK.

The room in which one sick with either disease is placed, must have no carpet, or only pieces, or rugs; must previously be cleared of all needless clothing, drapery, and other material likely to harbor the

(1) That this is of more importance than a case of small-pox is indicated by the fact of the much greater number of cases of sickness and of deaths from diphtheria and scarlet fever—for which there is no such preventive known as vaccination.

poison of the disease. Provision must be made for the introduction of a liberal supply of fresh air, without sensible currents and drafts.

The discharges from the throat, nose and mouth are considered 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 once used, must be burnt immediately.

The discharges from the patient must be received into vessels containing "chloride of lime," or some other disinfectant, and if not buried at once, must be thrown into a cess-pool, or a 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.

Nurses and attendants should be required to keep themselves and their patients as clean as possible—their own hands should frequently be washed and disinfected by chlorinated soda, or carbolic acid solution.

The nurse and attendants should be as few as possible, and they should not unnecessarily communicate with other persons. They should wear only such clothes as may be readily washed, which, when removed, should be placed immediately in boiling water and boiled 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 much exposed to the contagium of the disease.

Food, left uneaten by the sick, should never be carried where it will infect other persons. It should be burned immediately on removed from the sick room, and the dishes used washed by themselves, in boiling water—never with other dishes.

BURIAL OF THE DEAD.

No public funeral (1) shall be held of any person who has died from either disease, and no public funeral shall be held at a house, nor on any premises where there is a case of scarlet fever or diphtheria, nor where a death from such has recently occurred.

(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 the exposure thereof to the public at any place, preceding or during the funeral service. In other words, there should be *none* present except those absolutely necessary to prepare the body for interment or inter it.

The body of all persons who have died from scarlet fever or diphtheria, must, before removal from the sick room, be wrapped in a cloth saturated with a solution of corrosive sublimate, sixty grains to one gallon of water, then tightly sealed in a coffin, and buried immediately. No such dead body can be transported by private or public conveyance for burial elsewhere, except upon strict compliance with the rules of the State Board for the transportation of corpses.

DISINFECTION.

After death, or recovery of the sick, the room, furniture and other contents not to be destroyed must be thoroughly disinfected.

The paper on the walls and ceiling, if any there be, must be removed and completely burned. The floor, wood-work and wooden furniture painted over with a solution made by dissolving one ounce of corrosive sublimate in six gallons of water(1), let the painting remain one hour, then remove by washing with clean water. The walls if not papered must be thoroughly scrubbed and whitewashed.

Fumigation.—When a room and its contents are to be disinfected by fumigation, all articles therein must be so arranged as to expose the greatest amount of surface to the action of the disinfectant, *and all openings* to the room must be *closed tight.* It will add greatly to secure successful fumigation if the room be previously moistened by water spray, or a dampened sponge.

Disinfectants.(2)—Chlorine gas is a good disinfectant. To generate chlorine, take peroxide of manganese (to be obtained at any drug store), place in an earthen dish and add one pound of hydrochloric acid (sometimes called muriatic acid), to each four ounces of the peroxide of manganese. Care must be taken not to inhale the gas. After being certain that continuous evolution of chlorine has been secured, leave the room and close the door of exit.

The bleaching properties of chlorine may destroy the color of goods exposed to it. It will not injure the fabric or furniture.

Rooms subject to the action of disinfecting gas must afterward be thoroughly aired by opening all the doors and windows.

Heat as a Disinfectant.—It is believed that heat sufficient to be a disinfectant for this disease may be secured without destroying ordin-

(1) As this solution is poisonous it must be used with caution.

(2) After repeated tests made by a committee of the American Public Health Association, sulphurous acid gas is pronounced unreliable as a germicide. It is therefore omitted here. See appendix.

ary articles of clothing, say at 240° to 250° Fah. Therefore, all infected substances which are *not* destroyed must be either subjected to a dry heat of 250° Fah., in a closed room, or disinfecting oven, or be thoroughly fumigated, or thoroughly boiled in water not less than thirty minutes.

Fresh Air.—Although not so active for the destruction of the contagium as proper disinfectants, pure air, in liberal amount, is a very useful and important agent for the dilution and destruction of the poison of the disease; and should be employed freely under proper precaution against exposure to cold.

Body and Bed-clothing, etc.—It is *best* to burn all articles which have been in contact with the person sick with contagious or infectious diseases. Articles too valuable to be destroyed, must be treated as follows:

Cotton, linen, flannels, blankets, etc., must immediately on removal from the body or bed, and before removal from the sick-room, be placed, piece by piece, in boiling water, and then boiled thirty minutes. If not so treated, they must immediately on removal from the sick or bed, be immersed in a corrosive sublimate solution, prepared by dissolving one ounce of corrosive sublimate in six gallons of water; let them remain two hours, then wring out and send to the wash. This solution must be kept in wood or earthen vessels, and not metal.

Heavy woolen clothing, silks, furs, stuffed-bed covers, and other articles, which cannot be treated with the solution, must be hung in the room during fumigation, their surfaces thoroughly exposed, and pockets turned inside out. Afterward they must be hung in the open air, beaten and shaken. Pillows, beds, stuffed mattresses, upholstered furniture, etc., must be cut open, the contents spread out and thoroughly fumigated. Carpets are best fumigated on the floor, but must afterward be removed to the open air and thoroughly beaten.

The foregoing methods of disinfection are applicable in all contagious diseases.

PREVENTIVE MEASURES.

SCARLET FEVER.

Avoid the special contagium of the disease. This is especially important to be observed by children and all whose throats are sore from any cause. 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 frequently dangerous for children to go where adult persons go with almost perfect safety to themselves.

Do not let a child go near a case of scarlet fever. Unless your services are needed, keep away from the disease yourself. If you do visit a case, bathe yourself and change and disinfect your clothing before you go where there is a child.

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. While it is not definitely *proved* that the germs of scarlet fever are propogated in any substance outside the living human or animal body, *it is possible that they may be found to be thus propagated.* Therefore, and because the breathing of air laden with emanations from decaying meat, or from sewers, cess-pools, sinks, and other receptacles of filth, is believed to endanger health, great care should be taken to have the house, premises, and everything connected with dwellings, kept clean and dry; to have sewer-connections well trapped, and house-drains constantly well ventilated, and to have all carriers of filth well disinfected. Do not permit a child to enter a privy or water-closet, or breathe the air from a privy, water-closet, cess-pool, or sewer, into which non-disinfected discharges from persons sick with scarlet fever have entered, nor to drink water or milk which has been exposed to such air.

Do not permit a child to ride in a hack or other closed carriage in which has been a person sick with scarlet fever, unless the carriage has since been thoroughly disinfected.

Do not permit a pupil convalescent from the disease to re-enter a public school without a certificate of a physician that the proper precautions have been observed.

Do not permit a child to attend school from any family or building in which there is a case of scarlet fever, or has been such, within a period of thirty-five days previous. Public schools are a most prolific source for the spread of this disease.

Do not wear or handle clothing worn by persons during their sickness or convalescence from scarlet fever.

Do not permit a cat or dog, or fur-bearing animal, to enter a room where a person is sick with scarlet fever.

Beware of any person who has a sore throat. Do not kiss such a person, nor take the breath of such person. Do not drink from the same cup, nor use any article that has been used by a person sick with this disease.

DIPHTHERIA.

Observe rigidly every measure as given above for scarlet fever.

Beware of crowded assemblies in ill-vent'lated 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. Among these influences, perhaps the most common and powerful are *impure air* and *impure water*. Because of this, and as a means of lessening the danger of contracting almost all other diseases, the following precautions should always be taken, but more particularly during the prevalence of any such disease as this.

Filth is one of the chief predisposing causes of diphtheria.

The grounds under and around the house should be well drained.

No vegetable nor animal matter should be allowed to decompose on the surface of the ground near the house.

If any soap factory, slaughter-house, rendering establishment, or other source of foul odors contaminate the air which you and your children daily breathe, take immmediate measures through your local board of health or health officer, to have such nuisance abated.

Your own privy especially, should, at all times, be thoroughly disinfected, by dry earth, coal or wood ashes, or copperas-water, so as to prevent the air about it from becoming offensive.

Your whole house, and especially its sleeping rooms, should be well ventilated.

Your cellar should be dry and well ventilated; it should frequently be whitewashed, and always kept clear of decomposing vegetable or other substances.

No cess-pool should be allowed near the house. If there be one it should either be removed or be thoroughly and frequently disinfected with sulphate of iron (copperas).

Your house drains should be looked to with scrupulous care, to see that they are well trapped, kept clear, and ventilated into the open air. This ventilation may be secured by a one and one-half inch iron pipe, connected with the sewer pipe between the trap and the main sewer, carried along the chimney or otherwise to the top of the house. This will overcome all difficulties from the inefficiency of traps through overflow of the sewer, or back-water; and also the changes of current or draft in chimneys, where the ventilation pipe is simply carried into the chimney at the bottom. If placed inside the chimney it should be carried to the top of the chimney. The latter method is the most desirable mode of ventilation.

Your house should not have uninterrupted connection with a sewer. Be sure that the waste-pipes do not permit the entrance of sewer gas into the house, but that they enter the sewer through an open-air space, or at least through a space freely ventilated to the open air.

Be sure that your drinking water is not contaminated by surface drainage nor by leakage from the drain, gas-pipes, sewer, cesspool, privy vaults or stables.

RULES AND REGULATIONS TO PREVENT CONTAGIOUS DISEASES IN THE PUBLIC SCHOOLS.

RULE 1. Every person entering any public school of Iowa must give satisfactory evidence of protection by vaccination. (1)

RULE 2. The fact of vaccination and protection must be entered with each name on the school record, and on transfer and promotion lists.

RULE 3. Persons affected with diphtheria, measles, scarlet fever, whooping cough, or small-pox must be excluded from schools until the school officers, by authority of the attending physicians, or health officer, grant permission for their admission; and all persons from families where such diseases exist shall also be excluded.

RULE 4. It is the duty of every school teacher and school officer who discovers, or who has knowledge of a case of these contagious diseases to cause the fact to be immediately reported to the local board of health.

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, and direct its proper disinfection.

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(1) Section 22, Chapter 151, Laws 1880, provides for the removal of persons infected with small-pox; also for other persons in the neighborhood, and declares that the local board "*may take such other measures as may be deemed necessary for the safety of the inhabitants.*" I have no question at all, but local boards of health have the power to regulate and determine how vaccination shall be done; and that the board may direct that all persons shall be vaccinated.—*Decision of the Attorney-General, February* 12, 1881.

FINANCIAL STATEMENT.

The following is a statement of the receipts and expenditures of the State Board of Health for the fiscal period from June 30, 1885, to June 30, 1887:

RECEIPTS.

DATE.	NO. OF WARRANT.	AMOUNT.
1885.		
August 1	Warrant No. 14126	$ 494 28
August 27	Warrant No. 14390	175 00
September 1	Warrant No. 14454	263.77
September 30	Warrant No. 14748	303.03
October 31	Warrant No. 15098	283.43
November 6	Warrant No. 15167	176 00
November 6	Warrant No. 15168	23.00
December 2	Warrant No. 15408	464 87
December 31	Warrant No. 15629	393.66
1886.		
January 11	Warrant No. 15841	150.00
January 30	Warrant No. 16141	544.72
March 1	Warrant No. 16838	278.82
April 1	Warrant No. 17358	284.20
April 30	Warrant No. 18006	243.43
May 18	Warrant No. 18250	176.00
May 18	Warrant No. 18251	43.00
June 5	Warrant No. 18534	310.82
June 30	Warrant No. 18820	538.76
July 31	Warrant No. 19430	447.33
August 31	Warrant No. 19758	293.48
September 30	Warrant No. 19950	279.82
November 3	Warrant No. 383	476.19
November 9	Warrant No. 458	181.00
November 30	Warrant No. 580	363.35
December 31	Warrant No. 945	311.07
1887.		
February 1	Warrant No. 1366	285.79
February 1	Warrant No. 1365	138 00
February 1	Warrant No. 1371	23 00
February 28	Warrant No. 1545	323.47
March 31	Warrant No. 746	582 22
April 30	Warrant No. 806	243.42
May 10	Warrant No. 2289	206.00
May 10	Warrant No. 2290	27 37
June 1	Warrant No. 2391	213.87
July 1	Warrant No. 2714	387.14

EXPENDITURES.

DATE.	No. of voucher.	TO WHOM PAID.	AMOUNT.
1885.			
July 18	601	*Mills & Co.*	
		500 sanitary blanks	$ 15.00
		10,000 Form 28 B, sanitary survey	100 00
		1,000 lithograph letter heads	8 00
		12,000 Form 12 C, sanitary survey of school-houses	116.00
August 1	602	*J. F. Kennedy.*	
		Salary as Secretary 1 month	100 00
August 1	603	*L. F. Andrews.*	
		Salary as Assistant Secretary 1 month	91.67
July 25	604	*Carter & Hussey.*	
		500 circulars, Form 68 B	3.50
		150 circulars, Form 11 B	3.50
		500 envelopes	1.25
		100 circulars, Form 69 B	4.50
July 10	605	*Bond & Chandler.*	
		4 wood cuts	10.00
August 1	606	*L. F. Andrews.*	
		Expenses to Shelby, investigating small-pox	7.10
		Expenses to Humeston, investigating small-pox	5.07
August 7	607	*J. F. Kennedy.*	
		Expenses to Cromwell, investigating small-pox	9.55
July 1	608	*Redhead, Wellslager & Co.*	
		Pantagraph	1.00
		Drawing tack-lifter	.25
		6 dozen Dixon pencils	3.60
		1 dozen No. 4030 tablets	2.00
		3 sheets drawing paper	.84
June 29	609	*Western Union Telegraph Co.*	
		Telegrams	1.45
September 1	610	*J. F. Kennedy.*	
		Salary as Secretary 1 month	100.00
September 1	611	*L. F. Andrews*	
		Salary as Assistant Secretary 1 month	91.67
August 28	612	*Mills & Co.*	
		2 reams lithograph letter heads	16.00
August 15	613	*Bond & Chandler.*	
		2 wood cuts	15.00
		2 electrotypes	1.00
August 1	614	*Redhead, Wellslager & Co.*	
		12 library book-holders	2.40
		1 5-inch glass magnifier	5.75
		½ gross rubber bands, ¼	1.25
		1 gross rubber bands, ½	1.25
		12 gross rubber bands, No. 19	4.50
		1 box drawing tacks	.50
August 19	615	*W. W. Wallace*	
		1 wood engraving	8.00
August 14	616	*U. S. Express Co.*	
		Package transportation	6.60
August 22	617	*Butts Manufacturing Co.*	
		1 hand-stamp pad	.50
September 1	618	*J. F. Kennedy.*	
		Express charges	.25

EXPENDITURES—CONTINUED.

DATE.	No. of voucher.	TO WHOM PAID.	AMOUNT.
August 27	619	*American Express Company.* Package transportation	$ 3.20
August 21	620	*Sanitary Engineer.* 1 volume Plumbing Problems	2.00
July 9	621	*Western Union Telegraph Company.* Telegrams	1.40
August 20	622	*George S. Davis.* 1 volume Investigation of Diphtheria	1.00
August 21	623	*Lea Brothers & Co.* Stille on Cholera	1.25
August 25	624	*Telephone Company.* Message to Ames	.25
October 1	625	*J. F. Kennedy.* Salary as Secretary, 1 month	100.00
October 1	626	*L. F. Andrews.* Salary as Assistant Secretary, 1 month	91.67
September 26	627	*Carter & Hussey.* 500 envelopes, Form 3 A	1.00
		1,000 blanks, Form 7 E (6 forms)	20.00
		1,000 blanks, Form 6 C 1,500 blanks, Form 4 C 1,000 blanks, Form 5 C	50 00
		500 circulars	8.00
September 19	628	*A. E. Foote.* Hilton on Rest and Pain	1.50
		Walker on Intermarriage	1.00
		Kane on Opium Smoking	.90
		Beale on Disease Germs	2.25
		Tissat on Health	1.50
		Coffin on Dangers of Sepulture	.25
September 23	629	*American Express Company.* Package transportation	6.95
September 19	630	*United States Express Company.* Package transportation	6.70
September 16	631	*W. W. Wallace.* Wood engraving	5.00
August 26	632	*Western Union Telegraph Company.* Telegrams	5.50
September 12	633	*A. E. Foote.* Sayre on Lead Poisoning	.26
November 1	634	*J. F. Kennedy.* Salary as Secretary, 1 month	100.00
November 1	635	*L. F. Andrews.* Salary as Assistant Secretary, 1 month	91.67
October 9	636	*Post-office.* 500 2-cent stamps	10.00
		2,000 1-cent stamps	20.00
October 1	637	*Redhead, Wellslager & Co.* 1 quart ink	.75
		½ ream 6-lb. note paper	.75
		Cooke on Fungii	1.50
		Hagge on Microscope	3.50
		Hill's on Leprosy in British Guinea	10.75
		Philbrick on Sanitary Engineering	1.80
		Sternberg on Bacteria	4.00

EXPENDITURES—CONTINUED.

DATE.	No. of voucher.	TO WHOM PAID.	AMOUNT.
November 3	638	*Redhead, Wellslager & Co.* 1 doz. conte crayons	$ .20
		1 doz. pencils	.25
		1 doz. No. 4030 tablets	2.00
		1 doz. blue pencils	1.00
		1 gravity letter scale	4.00
		1 vol. Encyclopedia Britannica	6.00
		1 Todd's Index Rerum	2 50
October 1	639	*Post-office.* 500 2-cent envelopes No. 7	11.70
October 23	640	*United States Express Co.* Package transportation	7 50
October 12	641	*Journal of Com. Med. and Surg.* Subscription 1 year	2.00
October 26	642	*American Express Co.* Package transportation	1.90
October 3	643	*A. E. Foote.* Mace on "A Piece of Bread"	1.36
November 25	644	*Carter & Hussey.* 4,000 blanks, Form 2 C	38.50
		Binding 2 vols. Popular Science Monthly	2.00
		Binding 1 vol. Medical News	1.00
		Binding 3 vols. Comp. Med. and Surg	3.00
		Binding 1 vol. Journal Med. Science	.75
		Binding 1 vol. Sanitarian	.75
		Binding 1 vol. Sanitary Engineer	1.50
		Binding 1 vol. Scientific American	1 25
		10,000 circulars, Form 70 B	30.00
		500 envelopes	1.00
		2,000 transit permit blanks, Form 6 E	17.50
		Binding 21 vols. Records	78.75
December 1	645	*J. F. Kennedy.* Salary as Secretary, 1 month	100.00
December 1	646	*L. F. Andrews.* Salary as Assistant Secretary, 1 month	91.67
November 14	647	*Post-office.* 500 5-cent stamps	25.00
		2,000 2-cent stamps	40.00
November 25	648	*United States Express Co.* Package transportation	7.85
November 21	649	*American Express Co.* Package transportation	6.90
November 4	650	*J. F. Kennedy.* Expenses, sanitary investigation State Agricultural College	5.00
November 18	651	*Sanitary Engineer.* Subscription, 1 year	4.00
November 2	652	*G. P. Brown.* Davis on Plumbing	2.20
December 5	653	*G. P. Brown.* Sanitary News, 1 year	2.00
November 25	654	*State Medical Reporter.* Subscription, 1 year	2.00
November 1	655	*Butts Manufacturing Co.* 1 hand stamp rack	1.50
November 6	656	*James W. Queen* 1 test card	.75

EXPENDITURES—CONTINUED.

DATE.	No. of voucher	TO WHOM PAID.	AMOUNT.
January 1	657	*J. F. Kennedy.* Salary as Secretary 1 month	$ 100.00
January 1	658	*L. F. Andrews.* Salary as Assistant Secretary 1 month	91.67
December 5	659	*J. F. Kennedy.* Expenses as del. to Am. Med. Ass., Wash.	90.00
December 10	660	*J. F. Rollins.* 12,000 No. 12 post fol. manilla envelopes	49.20
December 10	661	*W. W. Wallace.* 6 wood engravings	36.00
December 1	662	*Redhead, Wellslager & Co.* Black's Laws of Health	2.00
		1 great gross rubber bands No. 19	3.38
		1 quart ink	75
		1 letter book, 10x14	1.50
December 14	663	*A. E. Foote.* Blythe on Foods	5.75
		1 pamphlet	.30
December 12	664	*Munn & Co.* Scientific American Supplement	5.00
December 29	665	*American Express Co.* Package transportation	3.55
December 22	666	*United States Express Co.* Package transportation	2.55
November 16	667	*Western Union Telegraph Co.* Telegram	1 95
January 7	668	*Post-office.* 1,500 2 cent stamps	30 00
		800 15 cent stamps	120.00
February 1	669	*J. F. Kennedy.* Salary as Secretary 1 month	100.00
January 1	670	*United States Express Co.* Package transportation	95.20
January 1	671	*L. F. Andrews.* Salary as Assistant Secretary 1 month	91.67
December 29	672	*Carter & Hussey.* 100 envelopes (printing)	.75
		Transit permits	3.00
		500 No. 11 envelopes	3.00
		2,000 Form 7B, diphtheria	30.00
		2,000 Form 3B, small-pox	30.00
		1,000 Form 71B	7 50
October 1	673	*Union Telephone Co.* Rent of telephone 3 months	20.25
January 25	674	*Carter & Hussey.* 1 quire book paper	.45
December 31	675	*L. Harbach.* 1 desk	14 00
December 24	676	*Eimer & Amend.* Five thermometers	12.75
January 25	677	*T. W. Shearer.* Analysis of flour	10.00
February 2	678	*Lea Bros. & Co.* American Journal Med. Science, 1 year	9.00
December 19	679	*The Sanitarian.* Subscription 1 year	4.00

EXPENDITURES—CONTINUED.

DATE.	No. of voucher.	TO WHOM PAID.	AMOUNT.
December 31	680	*Republican Publishing Co.* Fairall's History of World's Fair	$ 3.00
January 1	681	*Jour. Comp. Med. and Surg.* Subscription 1 year	2.00
January 26	682	*Am. Express Co.* Package transportation	90.65
March 1	683	*J. F. Kennedy* Salary as Secretary 1 month	100.00
March 1	684	*L. F. Andrews.* Salary as Assistant Secretary 1 month	91.67
January 1	685	*Telephone Co.* Rent of phone to April 1	20.25
January 29	686	*Mills & Co.* Mounting map	.50
February 1	687	*Redhead, Norton, Lathrop & Co.* 1 crayon holder	.40
		Cassino's dictionary	3.00
		1 dozen No. 40 pads	2 00
		1 dozen 10x14 double carbons	.75
February 20	688	*L. W. Andrews.* Analysis of flour	5.00
February 16	689	*Victor Manufacturing Co.* 1 kerosene oil tester	5.00
February 24	690	*Carter & Hussey.* Binding 1 volume Sanitary Engineer	1.50
		Binding 1 volume Sanitary News	1.00
January 9	691	*Emil Brendel.* 1 sack flour chemical analysis	2.25
February 8	692	*John Shepherd.* 1 sack flour, chemical analysis	1.85
February 15	693	*Thomas Harth.* 1 sack flour, chemical analysis	1.75
February 9	694	*King & Van Pelt.* 1 sack flour, chemical analysis	1.50
January 1	695	*Sanitary Monitor.* Subscription 1 year	1.00
January 19	696	*Western Union Telegraph Co.* Telegram	.90
February 18	697	*W. S. Robertson.* Attendance special meeting of board	23.00
February 18	698	*W. H. Dickinson.* Attendance special board meeting	5.00
April 1	699	*J. F. Kennedy.* Salary as Secretary 1 month	100.00
April 1	700	*L. F. Andrews.* Salary as Assistant Secretary 1 month	91.67
March 22	701	*L. W. Andrews.* Analysis 12 samples flour	50.00
March 18	702	*T. W. Shearer.* Analysis 6 samples flour	20.00
March 5	703	*A. A. Bennett* Analysis 2 samples flour	10.00
March 25	704	*Carter & Hussey.* Three hundred flour circulars	4.75
March 6	705	*E. & F. N. Spon.* 1 volume workshop receipts	1.73

EXPENDITURES—CONTINUED.

DATE.	No. of voucher.	TO WHOM PAID.	AMOUNT.
February 26	706	*U. S. Express Co.* Package transportation	$ 4.45
February 24	707	*American Express Co.* Package transportation	1.60
May 1	708	*J. F. Kennedy.* Salary as Secretary, 1 month	100.00
May 1	709	*L. F. Andrews.* Salary as Assistant Secretary, 1 month	91.67
April 1	710	*Telephone Co.* Rent of phone to July 1st	20.25
April 24	711	*Carter & Hussey* 250 sample sheets of Reg of Phys	7.50
		500 envelopes	1.50
		200 return of death blanks	1.50
March 31	712	*J. M. Ross.* 1,000 lithograph letter heads	10.00
April 1	713	*Redhead, Norton, Lathrop & Co* One-half ream impression paper	1 20
		6 dozen Dixon pencils	3.60
		1 sheet 3 ply bristol board	.10
April 19	714	*American Express Co.* Package transportation	2.40
April 7	715	*J. D. Seeberger.* 1 step-ladder	2.25
April 19	716	*Western Union Telegraph Co.* Telegrams	1.45
May 18	717	*W. S. Robertson.* Expenses investigating scarlet fever at Tipton	29.50
November 25	718	*Sanitary News.* 9 subscriptions 1 year	13.50
June 1	719	*J. F. Kennedy.* Salary as Secretary 1 month	100.00
June 1	720	*L. F. Andrews.* Salary as Assistant Secretary, 1 month	91.67
May 17	721	*Eimer & Amend.* 6 oil testers	35.60
		6 tested thermometers	30.00
May 18	722	*American Public Health Association.* Appropriation for disinfection investigation	25.00
May 24	723	*Carter & Hussey.* 1 6 quire journal	.75
		150 circulars, 17 B	1.50
		150 form 8 A	3.25
		150 No. 10 envelopes	3.25
		200 circulars	1.50
		475 form 3 A	1.00
May 10	724	*Mosier & Dahlberg* 1 dozen caligraph ribbons	9 00
May 22	725	*J. P. Bushnell.* 1 city directory	3.00
May 24	726	*American Express Co.* Package transportation	2 90
May 22	727	*U. S. Express Co.* Package transportation	1.20
May 20	728	*L. G. Comparet.* 6 thermometer cases	1.20

EXPENDITURES—CONTINUED.

DATE.	No. of voucher.	TO WHOM PAID.	AMOUNT.
July 25	729	*Bausch & Lomb Optical Co.* 1 No. 548 binocular microscope and 3 objectives	$ 135.00
July 1	730	*J. F Kennedy.* Salary as Secretary 1 month	100.00
July 3	731	*Chas. F. Chandler.* Analysis 10 samples flour	100.00
July 1	732	*L. F. Andrews.* Salary as Assistant Secretary 1 month	91.67
June 2	733	*J. M. Ross.* 2,200 lithograph letter heads, 8 forms	36.00
June 24	734	*Carter & Hussey.* 2,000 transit permits	17.50
		500 envelopes	2.25
June 4	735	*J. M. Ross.* 1 ream lithograph letter heads	10.00
June 22	736	*Post-office.* 500 No. 5 2-cent envelopes	11.00
		500 1-cent wrappers	5.50
June 4	737	*D. Appleton & Co.* Popular Science Monthly, 1 year	5.00
May 27	738	*Chas. H. Lathrop.* 1 Iowa Medical Directory	2.00
June 22	739	*U. S. Express Co.* Package transportation	1.35
June 5	740	*A. L. Worden* Palmer on Epidemic Cholera	1.00
June 28	741	*Redhead, Norton, Lathrop & Co.* 1 18-inch rubber ruler	.50
		1 18-inch flexible ruler	.60
		2 ruling pens	.05
		1 dozen No. 4030 pads	2.00
		1 ideal pen and pocket	2.90
		1 quart ink	1.00
		1 pint mucilage	.50
		1 Anneberg's filing case	.40
		1 Huppe's bacteriology investigation	2.13
		1 stylographic ink	.25
		1 Farr's Vital Statistics	9.90
July 24	742	*Carter & Hussey.* 2,000 Form 72 B	30.00
		1,000 Form 46 B	126.00
		500 No. 10 manilla envelopes	2 25
		Printing 1,000 envelopes	1.25
		150 Form 11 B	3.50
		1,000 Form 8 B	5.00
		1,000 Form 1 C	7.50
August 1	743	*J. F. Kennedy.* Salary as Secretary 1 month	100 00
August 1	744	*L. F. Andrews* Salary as Assistant Secretary 1 month	91.67
July 1	745	*Telephone Co.* Rent of phone to Oct. 1	20.25
July 7	746	*Eimer & Amend.* 1 Heumen's imported oil tester complete	15.90
July 1	747	*Post-office.* 250 No. 7 2-cent envelopes	5.85
		Postal Guide, 1886	1.00

EXPENDITURES—CONTINUED.

DATE.	No. of voucher.	TO WHOM PAID.	AMOUNT.
July 20	478	*United States Express Co.*	
		Package transportation	$ 6.15
July 23	749	*American Express Co.*	
		Package transportation	4.65
July 17	750	*C. L. Dahlberg.*	
		1 r'm onion skin paper, 83 sheets carbon paper	4.50
July 15	751	*Laing & McGorrisk.*	
		15 rubber tubing	1 88
		1 goose neck tubing	.35
June 29	752	*American Pub. Health Association.*	
		1 volume Lomb's Prize Essay	1.00
July 30	753	*L. F. Andrews.*	
		Expenses to Worth county (small-pox)	14.10
		Expenses to Grand Junction (small-pox)	4.38
August 31	754	*J. F. Kennedy.*	
		Salary as Secretary, 1 month	100.00
August 31	755	*L. F. Andrews.*	
		Salary as Assistant Secretary, 1 month	91.67
August 24	756	*Carter & Hussey*	
		1 4 qr day book	.60
		1,000 form 5 C 1,000 form 6 C 1,500 4 C	50.55
		Binding 1 volume Scientific American	1.25
		Binding 1 volume Sanitarian	1.00
		Binding 1 volume Analyst	1.00
		Binding 1 volume Sanitary News	1.00
		Binding 3 volumes Medical News	3.00
		Binding 1 volume Popular Science Monthly	1.00
		Binding 1 volume American Analyst	1.00
		1,000 envelopes	3.50
		200 envelopes	1 00
		100 mailing tubes	3.50
August 1	757	*Redhead, Norton, Lathrop & Co.*	
		1 Lincoln's School Hygiene	.50
		1 dozen No. 4030 pads	2.00
		1 dozen No. 4026 pads	.95
		1 dozen penholders	.90
		1 pint, Carter's ink	.40
		1 dozen No 4030 pads	2.00
		1 magnifying glass	.35
August 2	758	*A. G. Field.*	
		27 microscopic slides	6.50
July 14	759	*Western Union Telegraph Co.*	
		Telegrams	4.31
August 21	760	*American Express Co.*	
		Package transportation	4.05
July 29	761	*Eimer & Amend*	
		1 hydrometer bulb	3.00
July 28	762	*Iowa Staats Anzeiger*	
		Translation German circular	3.00
August 16	763	*United States Express Co.*	
		Package transportation	2.55

EXPENDITURES—CONTINUED.

DATE.	No. of voucher.	TO WHOM PAID.	AMOUNT.
August 20	764	*A. E. Foote.*	
		1 Risley on Weak Eyes	$ .20
		1 Mosely on Hydrophobia	.35
		1 Mease on Hydrophobia	.75
		1 Hare on Tobacco	.10
September 4	765	*Popular Science News*	
		1 year subscription	1.00
September 30	766	*J. F. Kennedy.*	
		Salary as Secretary, 1 month	100.00
September 30	767	*L. F. Andrews.*	
		Salary as Assistant Secretary, 1 month	91.67
September 24	768	*Carter & Hussey*	
		Binding one volume on Rabies	1.00
		5,000 transit permits	38 50
October 1	769	*Telephone Co.*	
		Rent of phone to January 1	20.25
		Message to Ames	.25
September 1	770	*Redhead, Norton, Lathrop & Co.*	
		1,000 No. 5 statements	1.25
		1 vol. Encyc Britannica	5.40
		1 rubber holder	.20
		1 6-qr. No. 796 index	1.25
		1 bottle ink	.15
		1 half ream legal cap paper	1.75
		2 gross 001-4 inch bands	1.50
August 14	771	*John L. Atwater.*	
		1 vol. Encyc. Britannica supplement	6.00
August 31	772	*R. L. Polk & Co.*	
		1 U. S Medical Directory	5 00
August 27	773	*Eimer & Amend.*	
		1 dozen glass oil cup plates	4.20
September 3	774	*L. G. Comparet.*	
		1 oil stone	1.05
August 2	775	*Western Union Telegraph Co.*	
		Telegram	.40
November 1	776	*J. F. Kennedy.*	
		Expenses to Am. Pub. Health Association	100.00
		Expenses to Swan—typhoid fever	5.00
November 1	777	*J. F. Kennedy.*	
		Salary as Secretary, 1 month	100.00
November 1	778	*L. F. Andrews.*	
		Salary as Assistant Secretary, 1 month	91.67
October 21	779	*J. M. Ross.*	
		4,000 lith. letter-heads	36 00
September 28	780	*T. W. Shearer.*	
		Analysis for poison—Creston case	35.00
October 25	781	*Carter & Hussey.*	
		2,000 transit permits	15.40
		1,000 Form 1 C	7.50
		1,000 Form 8 B	5.00
		Binding Popular Science Monthly	.75
		Printing 300 Form 3 A	1.00
October 25	782	*T. W. Shearer.*	
		Analyzing water	20.00

EXPENDITURES—CONTINUED.

DATE.	No. of voucher.	TO WHOM PAID.	AMOUNT.
October 26	783	*Readhead, Norton, Lathrop & Co.*	
		1 gross Blackstone pens	$ .75
		1 quart ink	.75
		2 bottles India ink	.70
		1 gross No. 19 bands	3.38
		1 dozen Dixon pencils	3.60
		1 quart mucilage	.75
		1 gross No. 284 pens	.75
August 30	784	*U. S. Express Co.*	
		Package transportation	11.80
October 25	785	*American Express Co.*	
		Package transportation	7.34
October 2	786	*Osgood, Risser & Co.*	
		1 piece crowelling	3.75
October 4	787	*State Medical Reporter.*	
		Subscription 1 year	2.00
October 15	788	*L. H. Bush.*	
		Soap	1.10
October 16	789	*A. E. Foote.*	
		Pamphlets Nos. 4,795, 5,279, 5,277	1.10
August 30	790	*Western Union Telegraph Co.*	
		Telegram	.25
October 26	791	*W. S. Robertson.*	
		Exp's to conference of State B'rds of Health	20.60
November 30	792	*J. F. Kennedy.*	
		Salary as Secretary 1 month	100.00
November 30	793	*L. F. Andrews.*	
		Salary as Assistant Secretary 1 month	91.67
November 24	794	*Carter & Hussey.*	
		5,000 No. 10 manilla envelopes	17.50
		1,000 form 73 B	3.00
		3,000 blank folding and stitching	40.00
November 26	795	*Redhead, Norton, Lathrop & Co.*	
		1 Maclagan's Germ Theory	2.55
		1 Hertelle's Overpressure	.85
		1 set color cups	.70
		No. 2 McGill's paper fasteners	.66
		No. 4 McGill's paper fasteners	.40
		1 Pierson on Sewerage	2.19
		1 Hoods on House Warming	4.38
		1 Drysdale on Health in House Building	2.62
		1 Brown on Water Closets	.85
		1 Gerhard on Prevention of Fires	.60
		1 Phinn on What to do in Accidents	.43
November 19	796	*C. C. Van Etten & Co.*	
		1 frame and glass	22.00
November 24	797	Picture frame	11.35
November 20	798	*T. W. Shearer.*	
		Water analysis	10.00
November 16	799	*J. M. Ross.*	
		1 ream lithograph letter heads	10.00
November 3	800	*American Veterinary Review.*	
		Subscription 1 year	4.00
		1 copy volume viii	4.00
November 10	801	*Sanitary Engineer.*	
		Subscription 1 year	4.00

EXPENDITURES—CONTINUED.

DATE.	No. of voucher.	TO WHOM PAID.	AMOUNT.
October 28	802	*Jour. Comp. Med. & Surg.*	
		Subscription 1 year	$ 2.00
November 3	803	*Sanitary News.*	
		Subscription 1 year	1.50
November 5	804	*L. H. Bush.*	
		Brush and sponge	1.10
November 26	805	*J. F. Kennedy.*	
		Expenses to Chicago (official)	25.00
December 31	806	*J. F. Kennedy.*	
		Salary as Secretary 1 month	100.00
December 31	807	*L. F. Andrews.*	
		Salary as Assistant Secretary 1 month	91.67
December 9	808	*Post-office.*	
		3,000 1-cent stamps	30.00
December 1	809	*Telephone Co.*	
		Rent of phone, Oct. 1 to Jan. 1	20.25
December 24	810	*Carter & Hussey.*	
		1,600 Form C	14.25
December 2	811	*Sanitary News.*	
		8 copies 1 year	12.00
December 18	812	*U. S. Express Co.*	
		Package transportation	10.75
November 30	813	*American Express Co.*	
		Package transportation	7.27
December 31	814	*Lea Bros. & Co.*	
		Medical News 1 year	5.00
December 8	815	*Munn & Co.*	
		Scientific American supplement 1 year	5.00
January 6	816	*Popular Science News.*	
		Subscription 1 year	2.00
December 16	817	*A. E. Foote.*	
		1 Macleodin alcohol	1.06
December 25	818	*L. G. Comparet.*	
		1 pair pliers	.75
		1 file	.20
December 17	819	*L. H. Bush.*	
		1 box soap	.60
November 15	820	*Western Union Telegraph Co.*	
		Telegram	.25
February 1	821	*J. F. Kennedy.*	
		Salary as Secretary 1 month	100.00
February 1	822	*L. F. Andrews.*	
		Salary as Assistant Secretary 1 month	91.67
January 24	823	*Carter & Hussey.*	
		250 envelopes	.75
		1,000 Form 73 B	3.00
		1,000 transit permits	36.00
January 26	824	*Rehead, Norton, Lathrop & Co.*	
		1 pint mucilage	.20
		1 water bowl	.25
		1 dozen pamphlet files	6.00
		1 dozen No. 4022 pads	.60
		1 pint copying ink	.50
		1 Ruskin's Venice	.75
		1 ream legal cap paper	3.50
		1 dozen No. 4030 pads	2.00
		½ dozen No. 00½ bands	2.00

EXPENDITURES—CONTINUED.

DATE.	No. of voucher.	TO WHOM PAID.	AMOUNT.
January 26	824	*Redhead, Norton, Lathrop & Co.*	
		4 ounces stylographic ink	$ .30
		1 Builders' Superintendence	.40
		½ gross pins	2.40
		1 gross Glucinum pens	1.50
		1 tablet	.15
		1 ink vent	.15
		1 pint mucilage, Arabin	.50
		1 gross Chancellor pens	.75
		1 pint Carter's mucilage	.50
		1 Dana's Geology	3.84
		2 Amberg files	1.00
		1 Allen's Analysis	4.00
		1 Cameron on Oil	2.13
		1 Richter on Chemistry	4.50
		1 Anderson on Effect of House Plants	1.15
January 20	825	*American Express Co.*	
		Package transportation	4.55
January 6	826	*The Sanitarian*	
		Subscription, 1 year	4.00
January 17	827	*United States Express Co.*	
		Package transportation	3.00
January 20	828	*Post-office.*	
		United States Postal Guide, 1 year	1.50
January 19	829	*Munn & Co.*	
		Architect and builder	1.80
March 1	830	*J. F. Kennedy.*	
		Salary as Secretary, 1 month	100.00
March 1	831	*L. F. Andrews.*	
		Salary as Assistant Secretary, 1 month	91.67
February 24	832	*Carter & Hussey.*	
		1,000 labels	2 50
		500 mailing tubes	10.00
		2,400 Form 2 C	21.75
		1,000 Form 60 B	15.00
		2,000 Form 21 B	30.00
		200 Form 13 A	1.75
		300 Form 11 E	1.75
		300 Form 9 E	1.75
February 24	833	*Post-office.*	
		3,000 1-cent stamps	30.00
February 18	834	*J. M. Ross.*	
		1,500 lithograph letter heads, 2 forms	15.00
February 22	835	*L. H Bush.*	
		Soap	1.00
February 19	838	*American Express Co.*	
		Package transportation	1.30
March 25	837	*Post-office.*	
		500 10 cent stamps	50.00
		500 5-cent stamps	25.00
		500 4-cent stamps	20.00
		2,000 2 cent stamps	40.00
		2,000 1-cent stamps	20.00
		1,000 No. 5 2-cent envelopes	22.00
		1,000 No. 7 2-cent envelopes	21.60
		1,000 No. 6 1-cent envelopes	11.00
		500 postal cards	5.00

EXPENDITURES—CONTINUED.

DATE.	No. of voucher.	TO WHOM PAID.	AMOUNT.
March 24	838	*Carter & Hussey.*	
		Binding 1 volume Popular Science Monthly	$ 1 00
		Binding 1 vol. Jour. Comp Med. and Surg.	1.00
		Binding 1 vol. Iowa Medical Reports	1.00
		Binding 1 vol. Amer. Jour. Med. Science	1.00
		Binding 1 vol. Medical News	1.00
		Binding 1 vol. New York Analyst	1.00
		Binding 1 vol. Sanitary News	1.00
		Binding 1 vol. Popular Science News	1 00
		Binding 1 vol. Scientific Amer. Suppl	1.25
		Binding 1 vol. Sanitary Engineer	1.50
		5,000 circulars	18.75
		250 envelopes	1 00
		Tabbing record	1.50
		10,000 form 75 B	118.25
April 1	839	*J. F. Kennedy.*	
		Salary as Secretary, 1 month	100.00
April 1	840	*L. F. Andrews.*	
		Salary as Assistant Secretary, 1 month	91.67
February 28	841	*Post Office.*	
		500 No. 5 envelopes	11.00
March 12	842	*A. E. Foote.*	
		1 Cressey on Tuberculosis from Meat and Milk	.15
		1 Drysdale on Contagious Diseases	.10
		1 Griscom on Uses and Abuses of Air	.50
		1 Hales on Ventilators	1.10
		1 Hopton on Mines	.50
		1 Hossack on Law of Contagious Diseases	.50
		1 Hutchison on Pedigree of Diseases	.60
		1 Percy on Effect of Meat and Milk on Health	.25
		1 Squibb on Legislation on Adulterat'n of Food	.20
January 22	843	*Western Union Telegraph Co.*	
		Telegrams	2.50
March 16	844	*W. B. Burford.*	
		25 copies National Conference proceedings	1.50
March 15	845	*Microscope.*	
		Subscription 1 year	1.00
March 23	846	*American Express Co.*	
		Package transportation	3.30
February 17	847	*U. S. Express Co.*	
		Package transportation	.50
May 1	848	*J. F. Kennedy.*	
		Salary as Secretary, 1 month	100.00
May 1	849	*L. F. Andrews*	
		Salary as Assistant Secretary, 1 month	91.67
April 1	850	*Telephone Co.*	
		Rent of phone January 1 to April 1	20.25
March 26	851	*Redhead, Norton, Lathrop & Co.*	
		1 dozen pen rubber pen holders	1.50
		6 3½ inch ink stands	.60
		1 Crew on petroleum	4 05
		1 gross Glucinum pens	3.00
		1 dozen No. 4,024 pads	.60
		1 dozen No. 4,022 pads	.55
		1 bottle red ink	.35
		1 Helyer on Plumber and Sanitary Houses	5.75
		1 quart mucilage	.87

EXPENDITURES—CONTINUED.

DATE.	No. of voucher.	TO WHOM PAID.	AMOUNT.
April 25	852	*Carter & Hussey.*	
		50 envelopes	$ .50
		Binding 1 vol. Scientific Am. Supplement	1.25
		150 Form 17B	1.50
		2,000 Form 76B	5 00
		150 blanks, township clerks	3.25
		150 blanks, city clerks	3.25
April 13	853	*A. A. Bennett.*	
		Analysis of water	10.00
April 14	854	*Western Lithograph Co.*	
		1,000 letter heads	8.00
March 3	855	*Sanitary News.*	
		Subscription 1 year	2.00
April 20	856	*United States Express Co.*	
		Package transportation	1.86
April 19	857	*American Express Co.*	
		Package transportation	1.33
April 15	858	*W. C. Conant.*	
		Sanitary Era, 1 year	1.00
March 10	859	*Western Union Telegraph Co.*	
		Telegram	.25
April 26	860	*Western Union Telegraph Co.*	
		Telegram	.50
April 25	861	*Wm. Ruppe.*	
		10 volumes Journal Am. Chem. Society	24.00
May 1	862	*Post-office.*	
		Postage overdue	3.02
April 19	863	*Western Union Telegraph Co.*	
		Telegram	.35
June 1	864	*J. F. Kennedy.*	
		Salary as Secretary 1 month	100.00
June 1	865	*L. F. Andrews.*	
		Salary as Assistant Secretary 1 month	91.67
May 19	866	*Western Lithograph Co.*	
		Letter heads, 1,000	8.00
May 25	867	*Carter & Hussey.*	
		Binding 1 vol	.75
		Binding 1 volume Popular Science Monthly	1.00
		Paper bricks	.50
		250 envelopes	.75
		450 circulars, 3 forms	4.00
May 21	868	*United States Express Co.*	
		Package transportation	3.43
May 21	869	*American Express Co.*	
		Package transportation	3.75
July 1	870	*J. F. Kennedy.*	
		Salary as Secretary 1 month	100.00
July 1	871	*L. F. Andrews.*	
		Salary as Assistant Secretary 1 month	91.67

EXPENDITURES—CONTINUED.

DATE.	No. of voucher.	TO WHOM PAID.	AMOUNT.
June 24	872	*Carter & Hussey.*	
		250 envelopes, printing	$ .75
		Binding 1 vol. Am. Veterinary Review	.75
		Binding 1 vol. Am. Chemical Society	.75
		Binding 1 vol. Sanitarian	1.00
		Binding 1 vol. Microscope	.75
		Binding 1 vol. Annals of Hygiene	.75
		Binding 7 vols. Journals Medical Science	7.00
		300 circulars	2.50
		Binding 20 vols. Health Records	70.00
July 4	873	*Western Lithograph Co.*	
		4,000 letter heads, 8 changes	32.00
June 7	874	*Otto Nelson.*	
		2,000 pamphlets in Swedish language	30.00
June 1	875	*Redhead, Norton, Lathrop & Co.*	
		1 dozen penholders	.40
		1 dozen rubber shields	.50
		1 bottle ink	.25
		1 quart ink	.75
		1 dozen letter press pads	.50
		1 bottle rubber stamp ink	.25
		1 Woodhead's Mycology	2.70
		1 Luckhart's Parasites in Man	7.92
		2 ink stands	1.00
		1 Adler's German Dictionary	4.10
		1 filing case	.40
June 8	876	*A. A. Bennett.*	
		Water analysis	10.00
June 17	877	*A. E. Foote.*	
		Hygienic pamphlets—miscellaneous	6.16
June 4	878	*United States Express Company.*	
		Package transportation	5.75
June 6	879	*D. Appleton & Co.*	
		Popular Science Monthly, 1 year	5 00
June 20	880	*American Express Company.*	
		Package transportation	3.15
May 20	881	*Annals of Hygiene.*	
		Subscription 1½ years	2.50
June 21	882	*Western Union Telegraph Company.*	
		Telegrams	1.55
May 20	883	*L. H. Bush.*	
		Ammonia	.25
		1 dropper	.10
		Soap	1.00
		Glue	.10
June 1	884	*Post-office.*	
		Postage over-due	.18
June 5		Amount overdrawn on Warrant No. 18534	10.00
		Total	$ 9,929.24

EXPENSES FOR BOARD MEETINGS.

1885.		
Nov. 6.	W. S. Robertson, mileage and attendance	$ 23.00
	P. W. Lewellen, mileage and attendance	30.00
	H. H. Clark, mileage and attendance	40.00
	W. H. Dickinson, mileage and attendance	5.00
	S. B. Olney, mileage and attendance	15.00
	J. M. Hull, mileage and attendance	28.00
	J. L. Loring, mileage and attendance	15.00
	M. Stalker, mileage and attendance	15.00
	E. M. Reynolds, mileage and attendance	23.00
1886.		
May 18.	W. S. Robertson, mileage and attendance	23.00
	P. W. Lewellen, mileage and attendance	30.00
	H. H. Clark, mileage and attendance	40.00
	E. M. Reynolds, mileage and attendance	23.00
	S. B. Olney, mileage and attendance	20.00
	W. H. Dickinson, mileage and attandance	5.00
	J. L. Loring, mileage and attendance	15.00
	Attorney-General, mileage and attendance	5.00
Nov. 9.	W. S. Robertson, mileage and attendance	25.00
	H. H. Clark, mileage and attendance	38.00
	P. W. Lewellen, mileage and attendance	30.00
	E. M. Reynolds, mileage and attendance	23.00
	S. B. Olney, mileage and attendance	20.00
	Jay D. Miller, mileage and attendance	25.00
	J. L. Loring, mileage and attendance	15.00
	Attorney-General, mileage and attendance	5.00
Feb. 1.	P. W. Lewellen, mileage and attendance	30.00
	J. D. Miller, mileage and attendance	25.00
	W. H. Dickinson, mileage and attendance	5.00
	H. H. Clark, mileage and attendance	28.00
	S. B. Olney, mileage and attendance	20.00
	J. C. Shrader, mileage and attendance	15.00
	J. L. Loring, mileage and attendance	15.00
	E. M. Reynolds, mileage and attendance	23.00
May 10.	P. W. Lewellen, mileage and attendance	30.00
	H. H. Clark, mileage and attendance	38.00
	E. M. Reynolds, mileage and attendance	23.00
	S. B. Olney, mileage and attendance	25.00
	W. H. Dickinson, mileage and attendance	5.00
	Jay D. Miller, mileage and attendance	25.00
	J. C. Schrader, mileage and attendance	25.00
	Attorney-General, mileage and attendance	5.00
	J. L. Loring, mileage and attendance	15.00
	M. Stalker, mileage and attendance	15.00
	Total	$ 923.00

TYPHOID (ENTERIC) FEVER,

BY

J. F. KENNEDY, M. D.,

SECRETARY STATE BOARD OF HEALTH.

Read before the State Board at the May meeting, 1887.

TYTHOID (ENTERIC) FEVER.

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

ITS CAUSE AND PREVENTION.

The cause of enteric, or typhoid fever is getting to be so definitely settled that there is a growing conviction among sanitarians that it has no right to exist among intelligent people, and yet the records in this office show that in the year 1883, 114 males and 99 females, or 213 persons died of this disease within the State of Iowa. Hardly one half the cases resulting fatally were reported. The deaths average about one in every ten cases. It is therefore fair to presume that nearly five thousand cases of this lingering and largely preventible disease occurred in this State during the one year alluded to.

Another important fact is that almost three-fifths of these deaths occurred between the ages of ten and thirty. As sickness and death are such important items in the great sum of wasted resources, and on the other hand, as "public health is public wealth," it becomes us as a commonwealth, to prevent, so far as possible, this unnecessary disease and death.

Measures looking to the restriction or prevention of typhoid fever can only be successful in proportion as the knowledge of its cause obtains, or as we become acquainted with the known laws by which that cause operates.

It is not usually considered a contagious disease, in the sense that small pox and scarlet fever are, and yet there can be no doubt that foul odors, arising from soiled bedding and clothing and from typhoid excreta that have undergone certain fermentative changes, can, and do produce the disease in others. In this sense, at least, it is a *communicable disease.*

Many of the most careful observers, the most eminent sanitarians,

agree that the disease is caused and perpetuated only by a *special contagium*.

It is further demonstrated that this specific poison is always present in the discharges from the bowels of typhoid fever cases; and possibly in that from the kidneys. It is generally believed that these excreta are comparatively innoccuous when first discharged, but that soon after, by a peculiar fermentative process, they acquire their dangerous character.

This disease germ, or contagium of typhoid fever, is not only developed or vitalized after being thrown from the bowels of the typhoid patient, but seems to be indefinitely multiplied, especially under the favoring conditions of heat, moisture and filth.

It is doubtless a fact that in a large majority of instances, the disease germ is introduced into the intestinal track by means of food and drink, especially contaminated water. The discharges are thrown into the privy vault, or as was the case in the late terrible Plymouth epidemic, upon the ground—in either case, by percolation or by drainage finding their way into the family well or into the public reservoir. The drinking of this water, its use for cleansing (?) milk cans, or diluting milk, or the use of milk that has been exposed to air contaminated with the typhoid poison, and the leechings from decomposing typhoid bodies into wells close to cemeteries, are the more direct means by which this disease is propagated. There are cases on record where typhoid discharges were thrown upon the manure pile during the winter. The disease germs survived the rigors of winter, and when the heat and moisture of spring came, those who assisted in removing the manure for fertilizing purposes, were stricken down with the disease in a most malignant form. It has frequently been traced to the escape of gas from sewers. It is most prevalent in the time of drought, and is especially associated with wells in which the water is very low, the poison germ thereby being rendered more concentrated and hence more noxious.

It seems so important that the foregoing statements relative to the causes of typhoid fever should be generally believed, that no further apology is needed for presenting herewith the opinions of some of our most careful observers, as well as eminent sanitarians.

Dr. Albert Buck says:

"That this disease depends to a great extent, upon the polluted air of sewers, cess-pools, and of the soil, is proved by very strong evidence. The morbific agent, conveyed through the medium of the air, finds its way into houses from cess-pools improperly located, or from drain-pipes imperfectly ventilated or badly trapped, or from impure soil beneath and surrounding the dwellings. Riecke gives a very unique and conclusive case of typhoid fever poisoning from fæcal emenations, in which two men who slept over a room where the evacuations of a typhoid-fever patient were placed, were seized with the disease. * * In twenty-one English towns, in which proper drainage-works had been adopted, the mortality from typhoid fever diminished 45.4 per cent."—*Buck's Hygiene and Public Health*, p. 587, v. 1.

Sir Walter Jenner, says of polluted drinking water:

"The spread of typhoid fever is, if possible, less disputable than the spread of cholera by the same means. Solitary cases, outbreaks confined to single houses, to small villages, and to parts of large towns—cases isolated, it seems, from all sources of fallacy—and epidemics affecting the inhabitants of large though limited localities, have all united to support, by their testimony, the truth of the opinion that the admixture of a trace of fæcal matter, but especially the bowel excreta of typhoid fever, with the water supplied for drinking purposes, is the most efficient cause of the spread of the disease, and that the diffusion of the disease, in any given locality, is limited, or otherwise, and just in proportion as the dwellers of that locality derive their supply of drinking water from polluted sources." (*Ibid*, p. 593.)

Dr. Parkes is very positive in his opinion that typhoid fever is caused only by water polluted with the excreta of typhoid-fever cases. He considers the case of the village of Nunney, recorded by Ballard, as furnishing very strong evidence in favor of the origin and propagation of the disease by a specific poison. The inhabitants of this village had been in the habit of using highly polluted water for years without causing the fever, when a person suffering from the fever came from a distant place, and the discharges from this person were washed into the stream from which the village drew its supply of drinking water. The result was that "between June and October, 1872, no less than seventy-six cases occurred out of a population of 832 persons. All those attacked drank the stream-water habitually or occasionally. All who used filtered rain or well water escaped, except one family who used the water of a well only four or five yards from the brook." Dr. Parkes further remarks, that "the case seems quite clear—first, that the water caused the disease; and secondly, that though polluted with excrement for years, no enteric fever appeared until an imported case introduced the virus. Positive evidence of this kind seems conclusive, and I think we may now safely

believe that the presence of typhoid evacuations in the water is necessary. Common fæcal matter may produce diarrhœa, which may perhaps be febrile, but for the production of enteric fever the specific agent must be present."(1)

Dr. G. V. Poore, F. R. C. P., of London, in his hand-book on "Our Duty in Relation to Health," says:

Typhoid is essentially a sewage poison, and is due either to the contamination of drinking water, or milk, with typhoid excrement, or to the inhalation of typhoid poison with sewer air.(2)

He gives an account of an epidemic of typhoid occurring at Lausen, near Basle, Switzerland, in 1882. Up to this time there had not been in this place, within the memory of man, a case of typhoid fever. The population consisted of 780 persons, of whom 350 were seized with the disease, beside 14 school children, who were infected during their holidays, and were stricken down after their return to school in other places. The outbreak occurred from water contaminated by the excreta of a farmer, who returning from a long trip, was attacked with typhoid fever, followed by three cases in the same house. A brook, which ran by the stricken farmer's home, became fouled by his germ laden excreta. This stream was used for irrigating meadows, and the water, not evaporated, found its way by percolation into a spring a mile distant, from which all the people of the village except six families, who escaped the disease, obtained their drinking water. Salt put into the water of the brook was readily detected in the spring at Lausen, while not a trace of 50 cwt. of flour made its way to the spring, proving that the water reached the spring by a filter so fine as to arrest the particles of flour but not obstruct the passage of the fever germs.

In summing up the causes of this epidemic, he says (*Ibid.*, p. 28):

This remarkable case shows:

1. That the power of mischief possessed by water-carried sewage is enormous

2. That the diffusibility of typhoid poison in water is practically infinite.

3. That water containing typhoid poison may not be purified by irrigation over water meadows, and subsequent filtrations through nearly a mile of solid earth (a filter fine enough to arrest particles of wheat flour).

4. That large typhoid epidemics are favored by a water supply common to many people, if by mischance that water supply gets fouled.

Or briefly, (*a*) "that one man has infected 350 others;" and (*b*) "that infection may travel for a mile through an under-ground filter."

(1) Buck's Hygiene and Public Health, v. 1, p. 594.
(2) Health Exhibition Literature, v. VII, p. 68.

ENTERIC FEVER CAUSED BY CONTAMINATED MILK.

Dr. Edward Ballard, who examined carefully the causes of an outbreak of enteric fever at Armley, in the Borrough of Leeds, England, where 107 cases occurred, eleven of which proved fatal, says:

It may now be considered established that the outbreak of enteric fever which suddenly occurred in the first week in July in Armley, was caused by the distribution through a part of the township of milk from a particular dairy, where the dairyman himself was lying ill with enteric fever, and where subsequently two of his children also suffered from the same disease.(1)

The same observer reporting the outbreak at Moseley and Balsal Heath, near Birmingham, Eng., says of the 96 cases occurring there:

The etiology of the outbreak of enteric fever at Moseley and Balsal Heath may, in my opinion, be thus summed up:

1. Two wells upon adjoining premises occupied by milk-sellers became infected early in November with the infectious matter or virus of enteric fever through the soakage from a privy into them of excremental matters containing the matter of infection.

2. Through the medium of water drawn from these wells the milk supplied by these milk sellers became infected, and many of their regular customers who drank the milk suffered from the disease.

3. The same infected milk having been sold to two other milk purveyors, some of the persons using the milk supplied by these milk-men, also suffered in a similar manner.

4. There is no evidence that the disease spread in these districts in any other way than through the consumption of these infected milks. (Ibid., p. 98.)

Dr. Ballard reports also, an outbreak of typhoid fever at Islington, in 1870. There were in the town about two thousand families. Of these, 142 families received their milk from a particular dairy, whose proprietor died of typhoid fever. In the ten weeks of the epidemic 175 cases of enteric fever, of which thirty proved fatal, occurred in seventy families of those using this particular milk. It was proved conclusively that the milk of this dairyman was exposed to the specific contagium of typhoid fever.

A report of 244 cases of enteric fever, distributed in 143 houses in Marylebone, London, England, was made by Dr. J. Netton Radcliffe. After availing himself of the able assistance of Dr. Murchison, whose own family suffered greatly from the disease during this epidemic, as well as of Drs. Whitmore and Confield, Dr. Radcliffe says:

(1) Medical Officer's Report, London Local Gov. Rep. No. 2, 1874, p. 86.

For the ultimate purpose of this inquiry, it is sufficient to have shown a probability amounting, for practical purposes, to a certainty—

1. The outbreak of enteric fever which forms the subject of this inquiry, was caused by milk infected with typhoid fever material.
2. That this milk came from a particular farm.
3. That the water used for dairy purposes on this farm contained excremental matters from a patient suffering from enteric fever immediately before and at the time of the outbreak. (Ibid., p. 127.)

Quite a number of outbreaks of typhoid have occurred in this country where the poison was conveyed through contaminated milk, as shown by incontestible evidence.

LOW WATER IN WELLS FAVORABLE TO THE PRODUCTION OF TYPHOID FEVER.

Dr. H. B. Baker, Secretary of the Michigan State Board of Health, in a paper read before the American Public Health Association, demonstrated clearly, from cases occuring within that State, the intimate relationship existing between typhoid fever and low water in wells, and explains the cause, on the theory "*that dilution of a fluid containing the specific cause of a disease lessens the chance of communicating that disease* when the fluid is brought in contact with the body," *i. e*, the lower the water in the wells, the more concentrated is the poison, and hence the more potent for mischief.

GROUND AIR A SOURCE OF TYPHOID FEVER.

Max von Pettenkofer, of Munich, claimed that as the water receded from the surface of the ground by evaporation and percolation, that the air penetrated the soil to greater depths, and that thereby the disease germs, which were quiescent when under water, were stimulated and indefinitely multiplied; and that under circumstances favoring the exhalation of this germ-laden air, it entered our dwellings and exerted its noxious influence.

Col. George E. Waring, in his "Fisk Fund Prize Essay on the Causation of Typhoid Fever," tersely says: "All the learning of the ages has taught us no better formula to express a perfect sanitary enviroment than the old one of Hyppocrates, 'pure air, pure water, and a pure soil,'"—implying that contaminated milk is the result of impure water or air.

NATURE OF THIS TYPHOID POISON OR CONTAGIUM.

Prof. Klebs says he has *constantly* found *organisms* in typhoid fever in the forms of rods and unsegmented threads, and that the tissue beneath the typhoid ulcer is found to be full of these *bacilli*. He believes the local symptoms are in proportion to the number of bacilli present.

Von Recklinghausen, Myer, Koch, Eberth, Klein, Ziegler, Tayon, Mozioconacci, Friedlander, Wenrich, and Gaffky, all describe the presence of bacilli in typhoid fever, which differ somewhat in size and shape, owing to their location. These bacilli were cultivated outside of the body, and their observations show that the typhoid bacilli are *not limited* to a parasitic mode of life in the bodies of human patients. They could be cultivated on the surface of boiled potatoes, milk, blood serum, meat broth, or human excrement.

Since these bacilli are invariably found in the diseased intestines and the internal organs during the progressive stages of typhoid fever, and since they have never been found in any other disease, Dr. Gaffky considers *their causual relation to the disease as extremely probable, if not absolutely proven.*(1)

Dr. E. Playter, of Ottawa, Canada, read a paper before the London Sanitary Convention on "The Typhoid Plant and its Favorite Soil," in which he fully adopts the doctrine that the bacillus of Wenrich and Eberth causes typhoid fever, and that its favorite soil, outside of the human body, is human fæcal matter, and refers to the development of typhoid mildew upon other fæcal matter and upon milk.

This brief reference to the cause of enteric fever would be incomplete without a reference to the fearful epidemic occurring at Plymouth, Pa., scarcely a year ago. Here over one thousand cases occurred in a few weeks, one hundred and seven resulting fatally. The causes leading to this outbreak were most thoroughly investigated by the local physicians, as well as by physicians of Philadelphia and elsewhere, and the unanimous and indubitable conclusion reached that it had its origin in the washing of the excreta of a typhoid fever patient into the reservoir supplying the town with drinking water.

Perhaps it is too soon to adopt unquestionably the germ theory of the origin of typhoid fever, but whether true or false there is, perhaps, at the present day, no better working theory from a sanitary point of view.

(1) Gaffky on Etiology of Typhoid Fever, report of Imperial Health Office, Berlin, 1884.

The lesson to be impressed upon the mind by these facts—the number of which, as recorded by eminent sanitarians, as well as by able and critical observers in the field of general practice, might be indefinitely multiplied—is the *great danger from water, soil and air pollution.*

PREVENTION.

Dr. Budd, who regarded enteric fever as *contagious*, recommended *prompt disinfection of stools*, stating that after adopting this course the disease, except in one instance, never spread beyond the individual first attacked, while before, he often saw several members of the family, or attendants, one after another, take the disease, even in airy and well appointed houses.(1)

The Hygienic Council of the French Academy of Medicine, fearing direct contagion, demanded in all cases: (1) Isolation of the patient; (2) Aeration of the chamber; (3) Disinfection of the evacuations; (4) Disinfection of clothing; (5) Disinfection of the room.

Liebermeister uses a porcelain bed-pan, sprinkling the bottom with copperas, and after the passage, the use of crude muriatic acid.

Flint directs carbolic acid, (1 part to 40 of water), and if the odor is objectionable, as a substitute, a saturated solution of copperas—a half pint to be poured over each stool.

Bathalow says the discharges should be disinfected at once by a strong solution of copperas or sulphate of zinc.

Dr. J. C. Wilson, physician to the hospital of the Jefferson Medical College, in an able paper on "The Importance of Thorough Disinfection of the Stools in Enteric Fever," says:

> "To accomplish all that is possible in preventing the spread of enteric fever, the plan of complete and immediate disinfection must be systematically applied; not only to the stools of the established cases, but also to those of cases that are beginning, that is to say, not only to the recognized but to the suspected cases. In this way, and only in this way, can enteric fever be stamped out."(2)

Koch, who tried a number of experiments with a view of ascertaining the destructive property of different agents when directed against fever spores and bacilli, proved carbolic acid, sulphurous acid and sulphate of zinc uncertain and feeble in their effects, and concludes that "the only certain disinfectants are chlorine, bromine, and corrosive sublimate." (*Ibid.*)

(1) The fever at the Clergy Orphan Asylum, Lancet, Dec. 6, 1856.

(2) American Journal of Medical Science, 1883, p. 356.

Dr. Wilson says of corrosive sublimate:

> "In this preparation of mercury we possess at a very moderate cost a disinfectant of the highest efficiency. It is free from color and odor, and in every respect convenient of employment. It is furthermore, not only sure, but also rapid in its action. On theoretical and practical grounds alike, it is *the* disinfectant to be preferred for use in preventing the spread of enteric fever." (*Ibid.*)

He recommends two drachms of corrosive sublimate to be dissolved in one gallon of water; to be kept in a large bottle or demijohn; properly labelled, and given to the nurse. Each evacuation should, immediately after its passage, be covered with this solution, and allowed to remain for fifteen minutes. A small quantity should also be kept in the bed-pan in the intervals of its use. "When using the water-closet, the handle of the valve must be kept up sufficiently long to thoroughly flush the trap, and a small quantity of the solution afterward poured into the basin of the closet and allowed to remain."

Col. Waring, who has great faith in the removal of all noxious elements by oxidation—exposure to the oxygen of the air—and who is a vigorous advocate of the earth-closet (dry earth) says:(1)

> "I therefore take the liberty of suggesting that a chamber or bed-pan, filled to the depth of an inch with dry earth—or with sifted anthracite ashes, or with powdered charcoal, be used to receive the evacuations; that this be immediately covered with a further inch in depth of dry material, and that the whole be turned into a *shallow* hole in the ground and covered with earth not more than two inches deep, so that it may go through with its decomposition in the upper soil within reach of the oxidizing air. If to be removed quite away from the premises, the earth containing the dejections may be thrown into a barrel or box, each deposit being covered with fresh earth, and carefully protected from rain."

Briefly enumerated, the best known and almost infallible means of preventing typhoid fever are:

1. *Strict cleanliness of homes and surroundings*, including the burning of decaying chips and saw-dust, and the removal of all decomposing vegetables from the cellar.

2. Care to have all sewer and drain-pipes, connecting with the premises, well trapped, and cess-pools and privy-vaults abolished, or

(1) Fisk Fund Prize Essay on "The Causation of Typhoid Fever, p. 14."

at least one hundred feet from any well used for drinking or dairy purposes. The use of the dry-earth closet is greatly to be preferred to the ordinary privy vault.

3. Every case should at once be reported to the local board of health, as a disease "dangerous to the public health," and isolation of the patient should be as rigidly enforced as possible, as much for the good of the patient as the public. The drinking water, sewer connections and milk should also be critically examined with a view to ascertain the origin of the disease.

4. *All the discharges of the patient* should at once be disinfected, by being well mixed with a solution of corrosive sublimate (two drachms to one gallon of soft water), or with a solution of copperas (three pounds to a gallon of warm water), and if possible buried rather than thrown into the sewer or privy vault.

5. During the run of the disease in a family, the *water and milk used for drinking purposes* should be boiled, and the *sale of milk* from such infected premises, *should be prohibited.*

6. Boiling for an hour will destroy the vitality of all known disease germs, and there is no better way of disinfecting clothing or bedding, which can be washed, than to put it through the ordinary operation of the laundry. No delay, however, should occur between the time of removing soiled clothing from the person or bed of the sick and its immersion in boiling water, or in a solution of corrosive sublimate (two drachms to one gallon of soft water).

7. *After death, or recovery*, the thorough disinfection and fumigation of the patient's room, and all its contents should be enforced. To fumigate a room effectively, three pounds of sulphur should be burned in a room ten feet square. Every opening in the room, including flue, except one door, should be closed, and the furniture and contents of the room so arranged as to admit as far as possible the contact of the fumes on all sides. The sulphur should be placed in a shallow iron pan, and these on a couple of bricks in a tub containing water. Coal oil or alcohol should be poured on the sulphur, and a match applied. The person igniting the sulphur should at once leave the room, as the fumes are highly poisonous, and the door should be tightly closed. The room should remain closed for twenty-four hours, when it should be thoroughly aired for several days.

8. The privy vault and cess-pool, if any, whether the disease is prevalent or not, should be disinfected at least once every week with a solution of copperas (one and one half pounds to a gallon of warm water). One of the best and cheapest disinfectants is chloride of lime, which can be used in the proportion of one fourth pound to a gallon of soft water.

9. As nearly all cases, whether occurring singly or in epidemic form, are traceable to water contamination, it is important that the water supply should be carefully examined as soon as the first case occurs, and if fouled, its use interdicted.

10. The discovery and practical application of some simple and inexpensive method for the *cremation of filth and garbage*, and the combustion therewith of the offensive and noxious gases caused by such cremation, will reduce to the minimum the present fearful rate of sickness and death from preventible causes.

HYGIENE OF THE UNBORN,

BY

G. C. MOOREHEAD, M. D.

Read before State Board at the May meeting, 1887.

HYGIENE OF THE UNBORN.

BY G. C. MOORELAND, M. D., IDA GROVE.

The dissemination of knowledge that is of vital importance to the health of the people, is a duty devolving especially upon the medical profession.

Should its performance lead the physician to enter the sacred circle of the home and there oppose the living truths of science to the impulses springing from the heart and called love, he must not falter.

None are so little thought of as the unborn.

Ignorance is the friend of disease, knowledge its greatest enemy.

The sphere of the moralist is fast approaching that of the physician.

Questions that are moral to-day will be medical to-morrow.

Is it not time, then, to banish the fetters of society, checkmate love, and consider the unborn as equal in importance with the living?

The intention of this paper is not the search for a new evil, but to point out an old and existing one.

The influence of heredity in disease; has long been recognized as an important factor, and to its cause many of the failures and disappointments of treatment can be ascribed. Though long known as an evil, no united effort has been made to stay its ravages, and one of the fundamental principles of treatment, viz: To remove the cause has been neglected, leaving the greatest etiological factor in the production of disease, active and uncurbed.

Notwithstanding the mass of evidence existing to establish the transmissibility of disease, there are a few who doubt its influence, yet none doubt the hereditibility of constitutional enfeeblement, or susceptibility to external impressions.

Were it not for the principle of heredity existing in nature, species could not exist; for evolution would cover the earth with a chaotic mass of life, rendering further development and progression impossible.

Heredity in its self is thus seen to be a beneficent law of nature, but it is the door through which the sins of digression of other laws are visited upon the third and fourth generation.

Disease is propagated by marriage in three ways:

First. When both parents are tainted with the same disease. Here the results can be calculated with almost mathematical precision.

Second. When both parents are tainted, but with different diseases. The results here are less certain, but almost as pernicious.

Third. When only one parent is predisposed to disease. The last is the least harmful; the first the most certainly harmful; the second the most extensively harmful; for here exists the most ignorance.

The popular belief that the evil results of heredity are effaced by propagation through several generations, is a most dangerous one. The grain of truth it contains is made an excuse for the most flagrant abuse of the laws of health.

The results of the intermarriage of diseases is almost as certain as the mixing of colors by the artist to produce shades: thus the marriage of cancerous and pulmonary consumptive dyscrasia, produces brain tubercle most frequently.

A drunken father and hysterical mother most often inflict the child with tabes dorsalis; while a merely weakened and enfeebled constitution in a mother, otherwise free from disease, combined with a syphilitic father, results in rachitis in the offspring.

The following, reported by Dr. Allen McLane Hamilton, shows the evil of intermarriage of insanity and apoplexy: In this case the father and paternal grandfather both were insane. The mother and maternal grandmother both died of cerebral hemorrhage. The result of this marriage, in a family of four children, was two epileptics, one insane, and one healthy.

The study of the blending of diseases through marriage is one of great interest, but in a paper of this kind it can only be hinted at.

He who would reform existing evils, must not begin by trying to stem the current at the mouth of the river. There is where the great majority of philanthropists and moralists have been engulphed by the magnitude of their undertakings. Let him seek the source. There, secluded in deep ignorance, it will be found. Remove the overhanging ignorance and superstition, enlighten the public mind upon the question vital to its well being, and the battle is won.

Do not infer from this that I think heredity can be wholly eliminated from the etiology of disease. Such a consummation, however

devoutly wished, cannot be expected until the millenium. However, there can be a great amelioration from the present condition.

Experience has shown the evil of consanguineous marriages, and an intelligent people, ever ready to do that which is for their own good, when pointed out and known, have made consanguinity a bar to marriage.

This is the direction from which relief must come.

Of primary importance then, is a guide-board pointing the right direction.

Here the physician must forget the trade, and remember that his is a profession, and for him to stand silently by and see those who look to him for counsel and advice, consummate a union, the fruits of which are pain and death, is as unpardonable as to see a blind man step into an abyss, when but a warning word would have saved his life.

Let us fearlessly assert the truth, and in due time an intelligent people, seeing that the precepts of their physicians are no idle, theoretical fears, demand that the laws of heredity be taught in the schools, and their observance be enforced by the courts.

TUBERCULOSIS IN CATTLE,

BY

PROF. M. STALKER,

STATE VETERINARY SURGEON.

Read before the State Board at the May meeting, 1887.

TUBERCULOSIS IN CATTLE.

BY PROF. M. STALKER.

Some time during last month, I was called by a prominent stock-breeder of this State, to give an opinion, on a disease that had made its appearance in his herd of cattle. The animals were high bred Holsteins, and had been kept in a manner approved by the best experience in the rearing of blooded cattle. During the past winter they had been housed at night, in a clean, dry and well ventilated barn, and allowed the freedom of well protected yards, during the day. The subjects of disease were all calves, about nine months old, and were a part of a lot of nine heifers that had been kept by themselves, during the winter. At the time I saw the herd, five were affected; the remaining four being to all appearances healthy.

HISTORY.

Some time in December, 1886, one of these calves was taken with a cough, which became persistent, and was followed by swelling about the throat, tumifaction of the parotid glands and enlargement of the thyroids. In the course of time, nodular enlargements appeared on various parts of the body, especially along the course of the lymphatics. In many of these swellings, pus was formed and indolent ulcers resulted. The muscles over the facial region became engorged and respiration much interfered with. These were the local symptoms presented at the time of my visit. The animal was much emaciated, and evidently the case had very nearly reached a fatal termination. Following the development of the foregoing case, four other calves, out of the lot of nine, began to show similar symptoms. Probably not more than two months had elapsed, from the time the disease was first observed, until these five cases were developed. All the later cases, with one exception, showed symptoms identical with the first,

though in a less malignant form. In one case, there was absence of anything like eruptions or nodular swellings, but the cough was of the same nature. In some of the more recent cases, there were papular eruptions, resembling those of small-pox; thickly distributed over the thinner portions of the skin that were comparatively destitute of hair. These, however, were persistent, with no tendency to cicatrize as in variola.

The five diseased animals had been separated from the remainder of the herd for six weeks or two months, at the time I saw them; since which time no further cases have developed.

All except the first case remained in fair condition, under very careful management and liberal feeding.

POST-MORTEM APPEARANCES.

As the one animal was evidently in a hopeless condition, I decided to destroy it in order to make an autopsy. On opening the thorax, no pathological changes of a specific character were revealed. The pericardium was partially filled with serum, but little altered in color from the normal, and a small patch of lung tissue in the left anterior lobe was collapsed and undergoing hepatization. The bronchial mucous membrane was comparatively healthy. The abdominal viscera showed better marked lesions. The mesenteric glands were enlarged and indurated, insomuch as to give the entire membrane a nodulated appearance. These varied in size from the bulk of a pea to a medium sized hickory nut. On making a section of these lymphatics, the caseous or cheesey character of the deposit was revealed. Deposits of the same nature were found distributed over various portions of the viscera. The walls of the upper air passages were the seat of important structural changes. Within the substance of the thyroid cartilage was a partially liquified mass of tissue. On the walls of the pharnynge and the posterior face of the soft palate were deep unhealthy looking ulcers. On the dorsum of the tongue, immediately in front of the soft-palate, were similar ulcers. The muscles of the face, and especially the masseter and alveola labialis were much thickened, and on making sections of these structures, the knife passed through a large number of nodular deposits that had undergone cheesey metamorphosis. These were so thickly distributed through the substance of the muscle, as to give to the cut surface a marbled appearance. The parotid glands were greatly enlarged. The thyroid bodies were

larger than hens' eggs and exceedingly dense. I preserved specimens of the diseased tissue from various parts of the body, and submitted them to my colleague, Dr. Fairchild, for examination in the microscopic laboratory of the veterinary college. The result of the Doctor's examination confirmed the opinion that I had already formed, that the diseased product was tubercle.

There are some points of special interest in this case.

First, the comparatively large number of animals affected in a short time, points with almost unerring certainty to the communicable nature of the disease. It is true, that four of the individuals belong to the same family, three of them being very closely related, and a fourth holding a somewhat distant kinship. The fifth belongs to an entirely different family. No constitutional taint exists in the ancestral line of either family, so far as could be learned. The rapid succession in which the cases developed precludes the idea that the disease could have been hereditary in all of these cases. The conditions under which the animals were kept, were on the whole favorable for communicating the disease. While the quarters in which they were kept were well cared for, the animals were in very close proximity, being confined in a small, loose box in one portion of the barn.

While in the bovine species, the structures about the upper air passages, afford a favorable seat for the deposit of tubercular matter, the pathology in these cases differed in some important respects from that which has ordinarily fallen under my observation. The difference, however, is rather one of degree than of kind.

I have uniformly observed that when a number of cattle were affected with tuberculosis in a single herd, that some, if not all, of them developed indolent ulcers about the throat. I have not heretofore observed the marked eruptions on various portions of the body, that was a noticable symptom on at least a portion of these cases.

Would the conditions under which the animals were kept, furnish an explanation for the somewhat anomalous pathology?

These cases seem to me to furnish some important material for the comparative pathologist and sanitarian.

THERMOMETRY OF HYGIENE,

BY

D. BENJAMIN, M. D.,

CAMDEN, N. J.

THE RELATIONS OF TEMPERATURE TO HEALTH IN DWELLINGS.

BY D. BENJAMIN, M. D.

The following interesting paper, prepared by Dr. D. Benjamin, of Camden, N. J., is so practical and contains so much useful information, presented in language so clear and free from technicalities, that it is reproduced in this report, with the belief that its careful perusal will be a great benefit—that it will lead to the avoidance of many errors in the construction of our homes and public buildings, and thereby prevent much unnecessary sickness and death. The paper and cuts are kindly furnished by *Carpentry and Building* for August, 1887. What is said in regard to the hygienic importance of a reliable thermometer is specially to be commended. While the judicious use of a thermometer will not cure disease, yet it will greatly reinforce the efforts of the physician and nurse, and what is better still, will prevent many cases of sickness.

THERMOMETRY OF HYGIENE.

What is generally called a cold is always produced by severe change of temperature, with or without moisture, to which a part or the whole of the person has been exposed. In most cases the change must be from a given temperature to a lower one in order to produce a cold. One is more apt to take cold if a part, and not the entire body be exposed to a low temperature. Dampness adds greatly to the power of a low temperature to produce a cold.

A cold is a disturbance of the circulation of the blood, whereby a part of the body has too little blood in it, and, therefore, some other part has too much. The part that has too much is said to be congested, and if the congestion is not promptly relieved by treatment, inflammation is sure to follow. If in the throat, croup; lungs, pneumonia; bladder, cystitis; etc.

The human flesh is elastic and contractile, and, therefore, when cold is applied to a part it contracts, holding much less blood, consequently some other part must contain more than it should. Moreover, all vital action goes on more slowly in a low than in a high temperature, so that by cooling a part overmuch its nerve energy and vital force are greatly affected, causing delayed and dangerous reaction, or actual destruction of a part, while the undue blood in some other part of the body lights up inflammation that would not have been called into existence without this stimulus.

Cold applied to the skin generally produces congestion of the mucuous membranes, because of their similarity of construction, nerve supply, and continuity of structure to the skin.

The most healthful temperature for the human body to live in is about 70° F.

In a slowly moving atmosphere, at 70° F., a person cannot take cold, but a change of 10°, especially if it is sudden, is often sufficient to cause one to take cold.

The foregoing are undeniable truths, based on physiology, chemistry and physics. Their importance and the practical application of them, especially in the prevention and treatment of diseases of the respiratory organs, will next be considered.

The conditions of temperature and circulation of air, vary greatly in rooms, especially those that are in use.

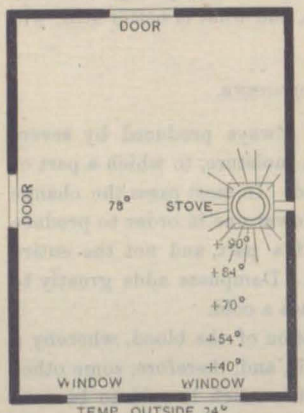

Fig. 1.

Fig. 1 gives results of experiments in a room ten feet high, twelve feet wide, and twenty feet long, with a good stove and steady fire. Three-story brick house, south front, 12 rooms, warm cellar. Out-door temperature, 24° F. By examination of Fig. 1, it will be seen that when the center of a room is 78° F., 4 feet from the window it may be 70° F.; 1 foot from the window, 54°; and at window 40° F, (no doors nor windows having been opened for 30 minutes) a difference in the room of 38° F.

In Fig. 2, a vertical section of the same room, it will be seen that

while the head is in 75° F., the feet may be in 50° F. What must be the effect on a person who removes his warm boots and wears slippers, or the one who lies down to sleep on such a floor? Many do these very things, however. A child three or four years old, from playing near a stove, or on a nurse's lap, in a temperature of 70° or 80° F., perhaps in a sweat, goes to the window and stands, without any change of clothing or other protection, for half an hour or more, in a temperature anywhere from 30° to 55° F. How such a thing can occur without resulting in croup or pneumonia, must be marvelous to any one who studies the subject even casually.

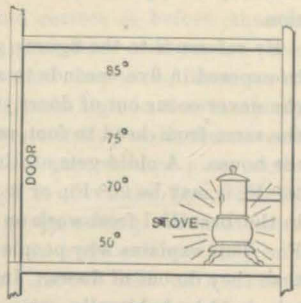

Fig. 2.

In many instances there is a small crack or opening, either under the sash or at the side, and almost always at the junction of the upper and lower sash, where a stream of air is passing into the room nearly as cold as the outside air, though it be below zero. Cold air at a high rate of speed, striking a child directly on a bare throat or breast can seldom fail to produce some dreadful disease.

On a very cold day, in some of the wooden houses inhabited by poor people with many children, and little time to look after them, children may often be found sitting on the floor in a temperature of 38° F., or standing with nose against window pane at 20° F., when the mother is washing or ironing at 65° F. These people generally have but one fire in the house, and that in a cook stove, which cannot possibly heat the floor at all, while cold drafts come from every other room, and especially from the stairway. In churches and theatres the galaries will be from 85° to 90° when the floor is 70° F. Then the opening of a door or window is very injurious, and going out into the air at 10° or 20° F. also causes a dangerous strain on the system.

In view of the principles already given, it seems to me that this is a striking state of affairs, and perhaps no principles of hygiene are so grossly violated as these. No wonder that the death list in Philadelphia alone in a single year reaches the dreadful sum of one thousand from pneumonia, and about four hundred from croup (preventable diseases in most cases). It is also somewhat remarkable that the subject has not before been written up in medical works. The ther-

mometry of hygiene and the sick room is a fruitful field for cultivation.

By reference to the figures given, it may be seen that it is easy to be exposed in five seconds to a change of 40° F., a circumstance that can never occur out of doors. In open air the temperature is nearly the same from head to foot, and changes much more slowly than in the house. A child gets off the bed and sits on the floor, a change of 10° F., it may be 20° F.; or it goes to the window, possibly to scratch in the beautiful frost-work on the glass, a change sometimes of 40° F. This explains why people take cold more frequently in the house than they do out of doors. In fact, I do not believe that people will take cold by habitually going out, if they exercise and are properly clothed.

By reference to Fig. 3, it will be seen that when the first floor was 48° and 50° F., the second floor was 65° F., and all the second floor room was of a more even temperature. This is owing, of course, to the cold under the first floor, and the heat, 90° F., under the second. It shows why the sick should be, if possible, in the second story, over a room that is heated, and why relapses occur when patients are permitted to come down stairs. The contrast is greater in many instances than shown in the figure, which represents a grade of houses better than the medium.

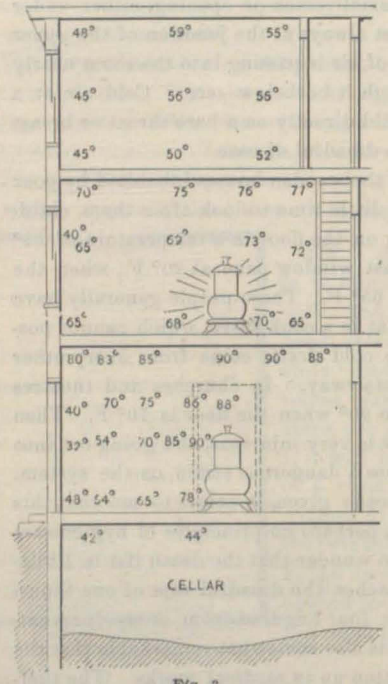

Fig. 3.

Most of the foregoing experiments may be performed as follows: Take 18 thermometers (common japanned tin cases), set them in water very cold, 33° F., and well stirred; ascertain the difference in the register, if any, and note it by pasting a little slip of paper

with the correction on it near the top. Then place the thermometers all in water at 120° F., well stirred, and correct as before; then in water at 70° F., and correct. These corrections will render them sufficiently accurate for practical purposes. Lay six of them across the floor, or better, on blocks one-half inch high in a row, equally distant, one from the other, extending from wall to wall; then stretch a string or wire across the room in the same vertical plane as the thermometers, and hang another row on it above the first. Stretch another row across in the same plane at the ceiling. You will then have three horizontal rows and six vertical rows. Wait thirty minutes, and read off the temperatures and record them on a piece of paper to represent the vertical section of the room. Any number of such sections may be made in a room, and should be made to include windows and doors, as a main feature. Temperature of windows can be very easily taken by placing or hanging thermometers on each sash.

It is clear from what has been stated, that to keep well, or to treat diseases, especially of the respiratory organs, such as pneumonia, croup, pleurisy, bronchitis, coryza, etc., we should keep an even temperature of about 70° F. The thermometer should be on a level with the patient's head, and near by. A good way is to hang it on the bed-post at the head of the bed, and the mercury should not be allowed to fall below 68° F., or rise above 74° F. If the floor is warm, the whole room can easily be kept so.

A bed should not be kept against a cold wall. If it cannot be in the middle of the room, it should not be near a window nor door, and should always be pulled out from the wall six inches or more, so that the cold air, which always descends along a wall, can have room to drop to the floor without flowing over the bed. A great many cases of rheumatism and neuralgia, come from sitting near a window.

I have often tried lecturing parents and nurses about the importance of keeping children away from windows, but it is very often impossible to have the instruction obeyed. Windows are very attractive to children, especially when the weather is too severe for them to play out. Any woman's mind would be dreadfully strained who has her housekeeping to attend to, if she were compelled to keep her eyes constantly on a number of children, even if she could compel them to obey when detected.

Some years ago I devised a contrivance to protect children from the death dealing windows in cold weather, which has given me, as

well as parents, much satisfaction. It is simply a fender of metal (also made of wood), about three feet high, and extending out from the window fifteen or twenty inches.

In some families where I have had these screens arranged to the windows for one or two years, I have reduced the medical attendance very greatly, as my books will show.

In Canada many of the houses have double sash, glass about four or five inches apart, and a very good device, and one that diminishes the coal bill also. They are a little unhandy to keep clean.

About two thousand cubic feet of fresh air is needed for each individual in a room, and when no fresh air registers are provided, can only be supplied through the key-holes and cracks around doors and windows, making necessarily, strong and dangerous drafts. The only resource left the physician, therefore, is the making of strenuous efforts to have people keep away from the dangerous places.

Leaving bed room doors ajar, or windows slightly raised in cold weather, is sometimes dangerous, on account of drafts, and though it may seem occasionally necessary, it generally requires more knowledge of sanitary science than is possessed by the masses.

On being called to see a case, I rarely find a thermometer in the sick room; its importance is not realized by the laity (or the profession). If there is one about, it is out of doors, or often good for nothing. The amount of ignorance in regard to the thermometer is remarkable. I often find people using one that is broken, and working against the pressure of the atmosphere, instead of a vacuum. Once a woman said to me on my second visit: "Doctor, I don't see as that theometer is any good; I've been a-watchin' it, and I had to use more coal to keep the room warm than afore I got it; I gist might as well a throwed the money away."

Still, I am in the habit of ordering a thermometer with the first prescription, though many would apparently pay five dollars for medicine more freely than twenty five cents for a thermometer that might save ten times that amount.

No one can tell by his own feeling whether a room is warm or cold; for often you will see two persons contending in the same room, one that it is too warm, and the other that it is too cool. It is obvious that we cannot regulate for invalids, or others, by our feelings. The only unerring guide is the silent, sensitive little column of mercury.

The more rooms that are kept heated in a house, the less drafts will be found. Especially heat the halls; it will not take much more coal, and will avoid forcing your heaters or stoves, and enable you keep easy fires. Keep the cold air from under the house also.

The artificial life of civilization causes greater susceptibility to colds, at the same time that it exposes us to greater changes of temperature; but science enables us, on the other hand, to oppose with some success these pernicious influences. The study of this subject shows not only the varied principles that lie at the foundation of successful practice, but also the importance of the collateral sciences to medical education. And it is believed that even the few suggestions of this paper, if properly applied, would reduce the amount of sickness and death consequent upon the habitual neglect of easy precautions.

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